

Dispositional Optimism and Judgments of Future Life Events: Affective States as Moderators

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Abstract This research examined the relation between dispositional optimism and judgments of future life events and whether this relation is moderated by affective states. In this study the moderating role of experimentally induced affective states, using film clips ($N = 259$), was investigated. After filling in the questionnaire for dispositional optimism, the participants were randomly assigned in the experimental conditions in order to induce positive versus negative affective states. Finally, the participants filled in the affective states and judgments of future life events scales. The results indicated that the participants with a higher level of optimism had the tendency to judge positive events as more likely and negative events as less likely to happen in the future. We found evidence for affective states as moderators; the association between dispositional optimism and judgments of future positive events depended on experimentally induced affective states. Specifically, in positive affective state condition, the association between dispositional optimism and judgments of future positive events was weaker than in both negative affective state and control conditions. The implications of these findings for understanding the role of optimism and affective states, in determining the judgments about the likelihood of future events are discussed.

Keywords Dispositional optimism · Judgments of future life events · Affective states · Moderation

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1 Introduction

Generally, people's predictions and perceptions about themselves are not accurate. Most people are optimistic, and this general expectancy of future positive outcomes is manifesting in different contexts, such as perception of self versus others or judgments about the likelihood of future events (Taylor and Brown 1988; Weinstein 1980). Researchers are not consistent in their terminology and often conflate trait optimism with other related constructs, including the bias of judgments about future life events also known as unrealistic optimism (Caponecchia 2010). Moreover, some researchers use different terms and measurement strategies referring to the same construct (see Shepperd et al. 2013 for review). Dispositional optimism and the bias of judgments about future life events are distinct constructs in their definitions and operations. Thus, the dispositional optimism is a generalised expectation of positive versus negative outcomes that pertains to the entire life of an individual (see Carver et al. 2010 for review; see also Carver and Scheier 2005). The bias of judgments about future events represent a person's tendency to judge that particular positive events are more likely to happen and negative events are less likely to happen to them than to other people (Shepperd et al. 2013; Weinstein 1980; Weinstein and Klein 1995). In this study we considered both concepts of dispositional optimism and bias of judgments about future events, more data on the relations between them being necessary.

The bias of judgments about future events has been confirmed for various health-related problems or social-related events (Chapin and Coleman 2003; Helweg-Larsen et al. 2011; Zell and Alicke 2011; Weinstein 1980), underlining the pervasive nature of this phenomenon. A debate still exists over whether this bias toward favourable outcomes is adaptive. Previous literature has suggested that these mild distortions in judgments are normal, promote a person's normal functioning and are related to positive emotions, adaptive coping strategies (Taylor and Brown 1988; Benyamini and Raz 2007) as well as favourable attitudes and health outcomes (see Armor and Taylor 1998 for review; see also Ingledew and Brunning 1999). On the other hand, this bias has been shown to also have unfavourable effects, affecting people's intentions to engage in preventative behaviour and even the manner in which they process the information (Radcliffe and Klein 2002). A high level of the bias of judgments about future events was related to a high rate of unhealthy or risky behaviour (Shepperd et al. 2002), reduced motivation to engage in healthy behaviour (Avis et al. 1989) and low interest in adopting preventive behaviour (Dillard et al. 2006; Weinstein 1980; Rafaely et al. 2011). Recent studies have begun to focus on the potential factors that may influence the judgments about future events (see Shepperd et al. 2013 for review; see also Gold and de Sousa 2012; Hoorens et al. 2008; Schwarz 1998). Few studies are aimed to explore the individual characteristics associated with differences in the level of judgments about future events (Helweg-Larsen et al. 2011), and they reported different findings. Thus, some studies highlighted the direct effect of self-esteem, anxiety, depression or affective states on judgments of future events (Chapin and Coleman 2003; Fedorikhin and Cole 2004; Harris et al. 2008; Hepburn et al. 2009), while others showed an indirect or moderated impact of agreeableness, extraversion or neuroticism on these judgments (Ingledew and Brunning 1999; Zelenski and Larsen 2002).

The link between dispositional optimism and judgments about the likelihood of future events was not directly or systematically investigated (Klein and Zajac 2009), the existing empirical findings being contradictory. Some studies indicated a significant association between dispositional optimism and judgments of events (Blackwell et al. 2013; Oginska-

Bulik and Juczynski 2001; Sharot et al. 2007), while others reported no association between these variables (Dillard et al. 2009; Fontaine and Cheskin 1999; Geers et al. 2013). Some researchers have suggested that the inconsistent results could be explained through other variables, including affective states, which may moderate the relation between dispositional optimism and judgments of future events (Radcliffe and Klein 2002). Previous literature has found significant relations among dispositional optimism, affective states and judgments of future events (see Slovic and Peters 2006 for review; Armor and Taylor 1998; Geers et al. 2013; Hepburn et al. 2009; Meevissen et al. 2011; Peters et al. 2010; Sweeny and Shepperd 2010), yet studies have neglected to examine whether affective states may moderate the link between optimism and judgments of future life events. In this regard, our research explored the relation between dispositional optimism and affective states, on one hand and judgments of future life events, on the other, and whether the association between optimism and judgments of future events is moderated by affective states. Understanding the potential factors that can modulate the optimistic bias could help researchers in developing novel interventions in order to reduce unrealistic judgments about future life events.

1.1 Dispositional Optimism

Dispositional optimism is an individual difference variable that reflects the extent to which people hold generalized favourable expectancies for their future (Carver et al. 2010). Recent comprehensive literature reviews and meta-analyses suggest that optimism is positively related to better outcomes across a broad range of situations (Carver et al. 2010; Rasmussen et al. 2009; Solberg Nes et al. 2005). Specifically, optimistic people tend to engage in more positive health practices, take action to minimize risky behaviour, use more active coping strategies and have better mental and physical health (Brydon et al. 2009; Gaudreau and Blondin 2004; Ho et al. 2010; Scheier and Carver 1992). Compared to pessimists, optimistic people have a higher level of positive emotions and life satisfaction (Daukantaite and Zukauskien 2011; Vacek et al. 2010; Wrosch and Scheier 2003). All these results have highlighted the role of optimism as a buffer for different life stressors (Gaudreau and Blondin 2004).

Although optimists may engage in mild distortions as part of their optimistic strategy, making them more likely to reveal a bias toward favourable outcomes in judgments of future events (Radcliffe and Klein 2002), there is little empirical evidence for this effect. Previous research on this correlation reported mixed findings. Some studies reported negligible or no correlations between dispositional optimism and judgments of future events (Dillard et al. 2009; Fontaine and Cheskin 1999; Geers et al. 2013; Ji et al. 2004; Radcliffe and Klein 2002). Other studies found significant relations between optimism and judgments of future life events (Blackwell et al. 2013; Geers et al. 2013; Oginska-Bulik and Juczynski 2001; Sharot et al. 2007). These contradictory findings may be explained through the type of investigated events, if negative or positive events were studied, respectively. Most previous research was more preoccupied with judgments of future negative events (Harris and Hahn 2011) and reported mixed findings. Some studies reported no link between the participants' dispositional optimism and judgments about the likelihood of negative events (Fontaine and Cheskin 1999; Geers et al. 2013; Ji et al. 2004; Radcliffe and Klein 2002). Other studies reported significant associations of dispositional optimism with judgments of future negative events; the participants that reported higher levels of dispositional optimism were less likely to expect negative events in the future (Blackwell et al. 2013; Oginska-Bulik and Juczynski 2001; Roberts and Geller 1995).

Considering the judgments about the likelihood of positive events, the results consistently showed that the participants with a high level of dispositional optimism were more likely to expect more different positive events (Blackwell et al. 2013; Ji et al. 2004; Sharot et al. 2007). In order to illuminate these relations, our research investigated the link between dispositional optimism and judgments of both future positive and negative events.

Finally, some researchers had explored whether the contradictory results about the association between dispositional optimism and judgments of future events may be explained through the moderating role of other variables. The results indicated that the participants' goals did not moderate the relation between optimism and judgments of future events, while confidence in the attainment of these goals was a significant moderator (Benyamini and Raz 2007). Furthermore, it was suggested that the impact of dispositional optimism on different outcomes, including judgments of future events, may partially be due to affective states (Peterson 2000; Radcliffe and Klein 2002), but the moderating role of affective states on the relation between optimism and judgments about events was neglected.

1.2 Affective States

Previous literature has shown that affective states or moods, defined as feelings that are less intense but which typically last longer in duration (George 1996), influence cognitive process strategies in a mood congruent manner. Recent comprehensive literature review on mood effects highlighted that positive affective states elicit positive thinking and judgments, whereas negative affective states lead to negative thinking and judgments (Bless and Fiedler 2006; Forgas 2013; Gruber et al. 2011; Slovic and Peters 2006). However, the topic of a beneficial effect of the affective states remains open; some researchers highlighted the beneficial effects of negative mood (see Forgas 2013; Gruber et al. 2011 for reviews) while others the beneficial effects of positive mood (see Lyubomirsky et al. 2005 for review; see also Ferguson and Sheldon 2013).

There is empirical evidence of the significant associations of affective states with judgments of future events (see Angie et al. 2011 for review; Geers et al. 2013; Sweeny and Shepperd 2010). For example, it was reported that judgments about future negative events were (positively) related to negative but not to positive affective states (Geers et al. 2013). However, most studies have explored the effect of experimentally induced affective states, using different types of experimental manipulations, such as film clips, brief stories, memories or music to briefly alter affective states (Drace et al. 2009; Ferguson and Sheldon 2013; Goldenberg and Forgas 2012; Hepburn et al. 2006; Isen et al. 1988; Yuen and Lee 2003). Generally, the findings showed that an experimentally induced negative mood reduces the judgments for positive events and increases the judgments about the likelihood of negative events even when the judged events were otherwise semantically unrelated to the stories used as the experimental manipulations (Hepburn et al. 2006; Johnson and Tversky 1983; Lerner and Keltner 2001). Thus, studies exploring the impact of positive affective states on judgments of future events indicated that the participants from the positive mood condition manifested an increase in judgments about the likelihood of future positive events and a decrease in the judgments about likelihood of negative events compared to those from the control condition (Blackwell et al. 2013; Fosnaugh et al. 2010; Meevissen et al. 2011; Peters et al. 2010).

Little research simultaneously examined the effect of both positive and negative affective states on judgments of future events. The existent results revealed that participants in a negative affective condition manifested less judgments about the likelihood of future

negative events than those who were in an either neutral or positive conditions (Chou et al. 2007; Fedorikhin and Cole 2004; Hepburn et al. 2009; Yuen and Lee 2003). Even more, some studies showed that experimentally induced positive and negative moods had the same potential bias on the likelihood of judgments of events—to approach positive events and to avoid negative future ones (Lench 2009). Based on these findings, researchers have highlighted that a negative mood had beneficial effects when it came to improving one's judgment's accuracy, leading to more systematic processing and a reduced level of risky behaviour and decision making (see Forgas 2013; Gruber et al. 2011 for reviews). Furthermore, researchers have suggested that people in a positive mood may be more prone to judgmental errors, and less motivated, even diminishing the expected hedonistic value of future achievement (see Forgas 2013 for a review; see also Goldenberg and Forgas 2012). Thus, researchers have emphasised that positive affects, despite some advantages, may have undesirable effects (Frederickson 2001; Gruber 2011), although these effects has been left relatively unexplored (Gruber et al. 2011, 2013).

Other studies failed to replicate the mood congruence effects on judgments of events (see Angie et al. 2011 for review; see also Drace et al. 2009; McFarland et al. 2003; Mauss et al. 2011; Yuen and Lee 2003). Thus, the findings indicated that the difference between positive and neutral conditions (Yuen and Lee 2003) or between positive and negative conditions (Drace et al. 2009) were not significant. There are some explanations for these inconsistent findings. One explanation is that the participants 'correct' their mood by adjusting their judgments in the opposite direction of the assumed mood influence (Mauss et al. 2011; McFarland et al. 2003). On the other hand, positive and negative moods are complex states, and it is possible that the same-valence emotions (e.g. *sadness* and *anger*) impact judgments in different ways (Angie et al. 2011). Future research is needed, however, to understand what the consequences of affective states on judgments about the likelihood of future events are. The current investigation has simultaneously addressed the role of both positive and negative affective states on the judgments of the likelihood about future events.

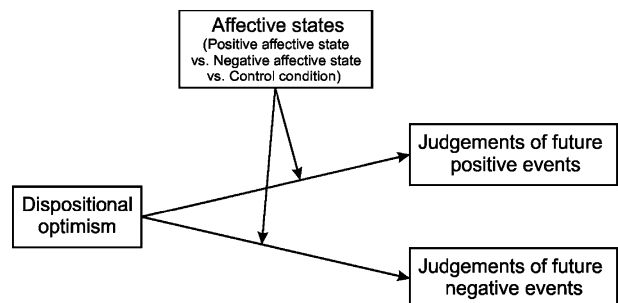
1.3 The Present Research

As we presented above, earlier empirical research revealed inconsistencies in the relation between dispositional optimism and judgments of future events (Blackwell et al. 2013; Dillard et al. 2009; Geers et al. 2013; Oginska-Bulik and Juczynski 2001; Sharot et al. 2007), on one hand, and in the relation between affective states and these judgments (Chou et al. 2007; Drace et al. 2009; Fedorikhin and Cole 2004; Hepburn et al. 2009; Yuen and Lee 2003), on the other. Therefore, the first aim of our study was to explore the association of optimism with judgments about likelihood of future events. Specifically, we expected that optimism positively correlated to judgments about future positive events, but negatively with judgments about future negative events (Hypothesis 1). The second goal of the study was to explore the effect of affective states on the judgments about the likelihood of future events. We expected an increase of the judgments of future positive events and a decrease of the judgments of future negative events in a positive mood condition compared to both negative and control conditions (Hypothesis 2).

Although earlier theoretical and empirical research documented that both dispositional optimism and affective states are important factors of judgments of future events, the way these factors work in interrelation in determining these judgments was less explored (Geers et al. 2013; Klein and Zajac 2009). However, some researchers emphasize that the inconsistencies in the relation between dispositional optimism and judgments of future

events may be explained by the moderating role of affective states (Peterson 2000; Radcliffe and Klein 2002), previous studies neglected to test the moderator impact of affective states in this relation. Even more, researchers have recommended experimental designs for future studies to address the moderating role of affective states in the relation between optimism and judgments about the likelihood of future events (Blackwell et al. 2013). To fill this gap in the literature when it comes to judgments about future events, the third aim of our study was to explore whether the relation between dispositional optimism and judgments of future events is moderated by affective states, using an experimental procedure to increase the magnitude of affective states. Specifically, from our study, in order to manipulate the affective states, we used film clip presentations, as it appears to be one of the most effective procedures (see Angie et al. 2011; Westermann et al. 1996 for reviews). Previous studies that used this experimental procedure indicated that people expect less negative events in a negative affective state condition than in both positive and non-intervention conditions, but more positive events in a positive affective state condition than in control conditions (Chou et al. 2007; Hepburn et al. 2009). In this study we added a control condition in order to explore the efficiency of the experimental manipulation. Thus, we assessed the impact of the affective states, using three experimental conditions: positive, negative, and control group, looking at the link between optimism and judgments when it comes to the probability of future events on a sample of undergraduate students. In order to check the impact of the experimental manipulation, the participants' affective states were measured immediately after the film's exposure (similarly with Hepburn et al. 2009). Considering previous research (Chou et al. 2007; Hepburn et al. 2009; Yuen and Lee 2003), we supposed that a positive affective state would increase the tendency of the optimists to expect more future positive life events and would reduce their tendency to expect less negative events compared to both the negative affective state and control conditions (Hypothesis 3a). In other words we expected that the positive mood condition would rather increase the association between dispositional optimism and the judgments about future positive events and decrease the power of the association between optimism and judgments about negative events compared to both negative mood and control conditions. Further, we expected that a negative affective state would reduce the tendency of the optimists to expect more future positive events to happen to them and would increase their tendency to expect more negative events, compared to both a positive affective state and control conditions (Hypothesis 3b). In other words, we expected that the negative mood condition would rather decrease the link between optimism and the judgments about future positive events and increase the power of the association between optimism and the ratings of negative events, compared to both positive mood and control conditions. The hypothesized moderated model is depicted in Fig. 1.

Fig. 1 The hypothesized moderated role of the affective state on the associations between dispositional optimism and judgments of positive and negative future life events



2 Method

2.1 Participants

A total of 263 undergraduate first and second year psychology students voluntarily participated in small groups for partial course credit. The participants who provided incomplete data or yielded outlier results were excluded. Therefore, the analysis was conducted from 259 undergraduate students (84 % females), aged between 19 and 28 years ($M = 21.05$, $SD = 2.73$).

2.2 Materials

2.2.1 Dispositional Optimism

Optimism was assessed using the 10-item Life Orientation Test Revised (LOT-R; Scheier et al. 1994). The items were rated on a 5-point Likert scale (from 0—strongly disagree to 4—strongly agree). Since the debates about the uni-versus the bi-dimensional structure of optimism are still on-going (see Carver et al. 2010 for review), we performed a confirmatory factor analysis (CFA) with a maximum likelihood approach. The indices revealed a good fit of the single factor solution (with two correlated errors): $\chi^2(8, N = 259) = 23.55$, $p = .003$; GFI = .97; NFI = .90; CFI = .93; SRMR = .05; RMSEA = .08. Therefore, we used a single summative index method for scoring the LOT-R scale; higher scores indicated a higher level of dispositional optimism. The internal consistency of our sample was acceptable (.71) and similar with the indices revealed by other previous studies (Blackwell et al. 2013; Scheier et al. 1994).

2.2.2 Affective State Induction

In order to manipulate the affective states, we used the film clip's presentation as it appears to be one of the most effective procedures (see Westermann et al., for a review). The materials' selection was based on a pilot study following a similar procedure as used in previous research (Chou et al. 2007; Fedorikhin and Cole 2004). More precisely, after viewing, in a random order, each of a series of six positive and six negative 4 min film clips, 37 students (76 % females, $M_{\text{age}} = 24.92$, $SD = 4.22$) reported their mood using the Positive Affect Negative Affect Schedule (Watson et al. 1988) on an 11-point scale ranging from -5 (sad mood) to +5 (happy mood). We selected one film, *Free Hugs*, that best enhanced the participants' positive mood ($M = 9.27$, $SD = 1.50$) and another one, *Poor Kids*, that had the strongest negative effect on the participants' affective mood ($M = 2.70$, $SD = 1.79$). The difference between the affects elicited by the two films was statistically significant and large ($t(36) = 13.59$, $p < .001$, $d = 3.98$). *Free Hugs* was a cheerful reportage about a social campaign, and represented the film clip for the positive affective state induction, and *Poor Kids*, a news-reportage about the life of a poor family was the material for the negative condition. We also selected a second happy film, *Balloons* ($M = 7.83$, $SD = 2.16$), that also had a significantly more positive effect than a sad one ($t(36) = 9.48$, $p < .001$, $d = 2.58$), in order to be displayed at the end of the negative affective state condition to neutralize the effect of the experimental manipulation. Similar with previous studies (Hepburn et al. 2009; Goldenberg and Forgas 2012), the films' soundtracks were replaced with happy and respectively sad music, in order to enhance the

affective state elicitation. During the experimental manipulation, the participants were asked to view one of the film clips according to their corresponding experimental condition and to rate the intensity of the emotions that they would have felt in the characters' place, based on a list of 18 affective state descriptors using a 10-point Likert scale (from 1—not at all to 10—very much). In order to select these emotions we conducted a pretest on 30 students, who received one positive (e.g. *Highest grades in all disciplines*) and one negative event (e.g. *An argument with one of their best friends*), respectively, and needed to list five affects that a young person could feel in each situation. These events were obtained in other previous pilot studies when students ($N = 20$) had the task to exemplify both positive and negative events that they may have experienced. Based on the students' answers, nine positive (e.g. *happiness, enthusiasm*) and nine negative (e.g. *disappointment, frustration*) affective states were selected for the evaluation of target affective states during the experimental manipulation.

2.2.3 Affective States

The Positive Affect Negative Affect Schedule (PANAS; Watson et al. 1988) is a widely used questionnaire for the assessment of positive and negative moods. The instrument is a 20-item scale consisting of 10 items for a positive affect (PA) and 10 items for a negative affect (NA). The participants rated all the items on a 5-point scale (1—*slightly or not at all*, and 5—*very much*) with that momentary time frame. The average scores were computed separately for each dimension; higher scores indicated a higher level of positive (PA) and negative (NA) affectivity, respectively. The internal consistency reliability of the scale was .86 for PA and .87 for NA, respectively.

2.2.4 Judgment of Life Events

The Judgment of Life Events Scale (JLE; Zelenski and Larsen 2002) is a 24-item instrument, developed to assess the likelihood judgments of future positive and negative events. It consists of 12 positive events (e.g. *What are the chances that you would win the lottery if you played regularly?*) and 12 negative events (e.g. *What are the chances that you will be in a serious car accident in the next 5 years?*). The participants rated the likelihood of experiencing the events compared with their peers, on a scale from 0 (very unlikely) to 100 % (very likely). Because there was no psychometric information about this instrument, we conducted an exploratory factor analysis (EFA) using principal axis factoring. EFA indicated a clear two-factor solution, with loadings ranging from .32 to .66 which accounted for 24.78 % of the total variance: Judgments of Positive Life Events (JPLE; 12 items, accounted for 9.47 % of the variance) and Judgments of Negative Life Events (JNLE; 12 items, accounted for 15.31 % of the variance). Composite mean scores were computed for each scale, higher scores indicating a higher likelihood of judgments of future positive and negative events, respectively. The reliability index in this sample for the JPLE was $\alpha = .74$, and for JNLE was $\alpha = .82$.

2.3 Procedure

The research was presented as an exploration of people's reactions in different situations. The participants filled in the optimism scale and then they were randomly assigned to one of the three experimental conditions (positive affective state condition, $n = 81$; negative

affective state condition, $n = 90$; and control condition, $n = 85$). The students filled in the scales for measuring affective states and judgments of future events. The participants from the negative condition were asked to view a happy film in order to neutralize the effect of the experimental manipulation.

3 Results

3.1 Preliminary Analysis and Manipulation Check

A multivariate factorial analysis of covariance (MANCOVA) with the affective state induction as a fixed factor and LOT-R, PA and NA as dependent variables indicated that the participants' age and gender did not covariate, and therefore, were not entered in the subsequent analysis.

One-way MANOVA was used in order to check if the experimental induction was effective in manipulating the participants' mood measured immediately after the film clips. There was a significant main effect of the experimental manipulation, $F(2, 255) = 29.55$, $p < .001$, $\eta_p^2 = .18$. One-way ANOVA revealed a significant effect of the manipulation on PA and NA, $F(2, 253) = 47.32, 49.71$, all p values $< .001$, $\eta_p^2 = .27, .28$. In the positive condition the participants reported higher scores on PA ($M = 3.35$, $SD = .61$) and lower scores on NA ($M = 1.39$, $SD = .42$) than those in the negative affective state (PA: $M = 2.43$, $SD = .73$; NA: $M = 2.26$, $SD = .73$), and control (PA: $M = 3.21$, $SD = .66$; NA: $M = 1.59$, $SD = .59$) conditions. Also, the participants from the negative condition reported higher scores on NA and lower scores on PA compared to those from the control condition.

3.2 Effect of Experimentally Induced Affective State

The analysis of variance with repeated measures (ANOVA) with affective state manipulation (positive, negative vs. control condition) as a between-subjects factor and type of events (positive vs. negative) as a within factor was conducted in order to examine the effect of the experimental manipulation on judgments of future events. There was a main effect of judgments of events [$F(1, 253) = 321.87$, $p < .001$, $\eta_p^2 = .56$], as participants rated that the positive events were more likely to happen to them ($M = 49.23$, $SD = 12.89$) than negative events ($M = 27.11$, $SD = 13.93$). There was no main effect of experimental manipulation on judgments of future events [$F(2, 253) = .56$, $ns.$] and no significant interaction effects [$F(2, 253) = 1.69$, $ns.$].

3.3 Correlations

The correlational analyses indicated that dispositional optimism was positively associated with judgments of positive events ($r = .43$, $p < .001$), and negatively with judgments of negative events ($r = -.28$, $p < .001$).

3.4 Testing for Moderation

Furthermore, we tested the hypothesised model stating that optimism is significantly associated with both judgments of future positive and negative events, and that these

relations are moderated by experimentally induced affective states (see Fig. 1). Since all the variables met the normality assumptions (all p values of the Shapiro–Wilk Test $>.05$) we applied Structural Equation Modeling (SEM; Arbuckle and Wothke 1999) in order to test the presumed associations. Concerning the moderation effect, we applied a multi-group analysis approach using critical ratios to identify significant differences between experimental groups (positive, negative and control conditions) on each path (Byrne 2009). Initially, we tested the measurement model (Anderson and Gerbing 1988) and the presence of the common method (self-report) bias (Podsakoff et al. 2003). Based on item parcels (two for each latent factor), we conducted a Confirmatory Factor Analysis (CFA) with a maximum likelihood estimation. One-factor solution (common self-report bias) and three correlated factor solution (dispositional optimism, judgments of positive and negative events) were tested and compared. The three correlated factor solution corresponded with the data best, revealing a very good fit [$\chi^2(7) = 13.538, p = .060$; RMSEA = .061, 90 % CI [.000, .109]; CFI = .98; NFI = .97] and being superior to the single factor model ($\Delta\chi^2 = 169.661, \Delta df = 2, p < .001$). We computed summative scores for all three variables and specified the hypothesised paths. As assumed, optimism was significantly associated with judgments of both future positive ($b = 8.32, p < .001$) and negative ($b = -5.87, p < .001$) events, in the expected directions.

Further, we tested whether the links among dispositional optimism and judgments of future positive and, negative events, respectively, differ in strength when conditioned by an affective state. In order to test the presumed moderations, we used critical ratios (z-scores) comparisons between groups on each specified path. A significant difference is flagged by a critical ratio value greater than 1.65 for the 90 % confidence, 1.96 for 95 %, and 2.58 for 99 %.

Comparing the regression weights for the path between optimism and judgments of positive events indicated that the relationship in the positive affective state condition ($b = 5.27, p < .001$) was marginally significantly weaker compared to the negative state condition ($b = 9.39, p < .001$; $z = 1.66, p < .10$), and significantly weaker than in the control condition ($b = 11.05, p < .001$; $z = 2.37, p < .01$); between the last two groups the difference was not significant ($z = 0.57, ns.$). More precisely, when the participants experienced an elevated positive affective state, the judgments of future positive events were less influenced by dispositional optimism, compared to the judgments they made in both negative or control conditions. There were no significant differences between the positive ($b = -6.78, p < .001$), and both the negative affective state ($b = -5.42, p = .007$; $z = 0.47, ns.$) and the control conditions ($b = -4.94, p = .059$; $z = 0.55, ns.$) or between the negative affective state and control conditions ($z = 0.14, ns.$) for the path between optimism and judgments of future negative events (Fig. 2). The pattern of results for the multi-group comparisons is presented in Table 1.

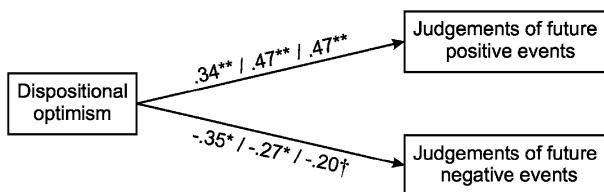



Fig. 2 The pattern of relations between dispositional optimism and judgments of future positive and negative events. From left to right, the standardized regression weights are for the positive, the negative affective state and the control conditions; $^{\dagger}p = .059$, $*p < .01$, $**p < .001$

Table 1 Critical ratios comparisons for multi-group analysis

Critical ratios comparisons for multi-group analysis							
	Positive		Negative		Control		Z score
	Estimate	p	Estimate	p	Estimate	p	
Dispositional Optimism → Judgments of Positive events	5.27	< .001	9.39	< .001	11.05	< .001	
Compared group pairs							1.66†
							0.57
							2.37**
Dispositional Optimism → Judgments of Negative events	-6.77	.001	-5.41	.007	-4.94	.059	
Compared group pairs							0.47
							0.14
							0.55

Positive = positive affective state condition; Negative = negative affective state condition; Control = control condition;  depicts the pairs of experimental groups being compared; † $p < .10$; ** $p < .01$

4 Discussion

The first aim of our study was to explore the correlation between judgments of future events and dispositional optimism. Our data supports that dispositional optimism, as a personality trait, is significantly related to judgments of future events; optimism was positively associated with judgments of future positive life events but negatively to judgments of future negative events. These findings are consistent with previous research indicating that optimistic people tend to think that more positive (Blackwell et al. 2013; Geers et al. 2013; Sharot et al. 2007) but fewer negative events will happen to them in the future (Blackwell et al. 2013; Oginska-Bulik and Juczynski 2001; Roberts and Geller 1995).

Further, the second aim was to test the effect of affective states induction on the judgments about the likelihood of future events. The results indicated that the effect of affective states on judgments of both positive and negative future life events was not significant, although the experimental manipulation was successful. There are few possible explanations of these findings. Firstly, Drace et al. (2009), who also failed to replicate the mood congruence effect, suggested that the effect of mood on judgments of events depends on specific features of the mood induction method rather than on mood *per se*. Therefore, the authors raise questions about the veracity of the mood effect on these judgments. Secondly, it is possible that the influence of mood could be moderated by other variables, including personal characteristics (Fedorikhin and Cole 2004). Therefore, for some people it is more likely that their mood could make judgments about future events, but for other people the influence works in the opposite manner, and consequently, no significant differences were found at the group level. Thirdly, it is possible that the lack of effect of mood

on likelihood judgments due to the participants' tendency to adjust their mood in the opposite direction of the assumed mood influence because they were aware of their mood (McFarland et al. 2003).

The third aim of the current research was to explore whether the association between dispositional optimism and likelihood judgments was moderated by experimentally induced affective states. We expected that the power of associations between optimism and judgments of future events depends on the induced affective states. Specifically, our hypothesis was that a positive affective state would increase the link between optimism and judgments about future positive life events but decrease the power of association between optimism and judgments of future negative events compared to both the negative affective state and control conditions. Further, we expected that a negative affective state would reduce the link between optimism and judgments about future positive life events and would increase the power of the association between optimism and the rating of negative life events compared to both a positive state and control conditions. The results showed that the association between optimism and judgments of future positive events was moderated by affective states but in the opposite direction. Specifically, when participants experienced higher positive mood, the positive association between their levels of optimism and the judgments of future positive events significantly decreased in intensity as compared to the case of participants that experienced higher negative moods or those who were in the control condition. Our findings did not support our expectations; moreover, these results contradicted them. Specifically, the positive affective state, compared to negative affective state, actually reduced the role played by dispositional optimism in the ratings of future positive life events. That is, the participants high in optimism, when in a positive affective state, reduced their optimism about the future, debasing their positive expectations. In other words, a high level of positive affective states diminishes the importance of optimism as a stable trait in estimating the probability of future positive events. This data could be interpreted as indicating an adaptive feature of dispositional optimism because optimists try to minimize the probability of bias of positive events in a positive mood condition. Our results contradicted the recent data suggesting the undesirable effect of positive affective states, such as unrealistic high levels of expectations of positive events (see Forgas 2013; Gruber et al. 2011 for reviews). We can explain these results from the fact that sometimes people have the tendency to 'correct' their mood by adjusting their judgments in the opposite direction of the assumed mood influence (McFarland et al. 2003). People are more likely to correct for mood bias when they are aware of their mood, which can arise simply from asking people to report their mood. Thus, the dispositional optimism can include a mechanism that may reduce the positive judgments when in a positive mood. Another explanation of these results could be the variations in the levels of optimism, both moment to moment and over extended periods highlighted by previous literature (Carver et al. 2010). In our study the trait optimism was positively associated with judgments of future positive events across all affective state conditions, this relation being weaker in the positive mood situation. The positive affective state condition could be a situation in which optimism has its drawbacks, and consequently we can assume that optimists could be aware of the potential negative consequences of an excessive bias in their judgments and they try to reduce the bias of their judgments about future events. This tendency could be considered as a mechanism that protects people from the harmful effects of confrontation with the reality of their unrealistic judgments of future. Finally, other variables, including personal characteristics, could moderate the influence of mood on judgments about future events (Fedorikhin and Cole 2004). One of these variables can be in fact dispositional optimism.

The direct link between dispositional optimism and judgments of future negative events indicated that this personality trait is a strong negative predictor of expectation of negative events, regardless of the affective state. These results may be explained by the way we induce specific affective experiences, raising the question of veracity of the mood effect for the participants (Drace et al. 2009). Also, it is possible that the impact of mood on judgments of future events could be moderated by other variables, such as the explicit intention (Ferguson and Sheldon 2013). Because few studies have examined the association between optimism and judgments of events, and no other study explored the moderating role of experimentally induced affective states in this relation, we cannot compare our results with other empirical findings. More research is needed to better understand these intriguing effects.

Some limitations should be noted. Firstly, these studies relied on self-reports; the participants rated the events from a standardized list and not all these events may be relevant for adolescents and young people. As previous studies suggested, the salience of events is important in judging future events, because people judge events as less likely to happen to them if these events are not personally relevant (Geers et al. 2013; Schwarz 1998). One way to ensure that events are relevant is to ask each participant to generate their own list of future events (Hoorens et al. 2008). Secondly, the experimental manipulation was too weak to determine changes in the judgments of future events. On one hand, this was possible because our research had insufficient power to detect an affective state effect, considering that effects in psychology are typically small and require large samples (Drace et al. 2009). Although the sample was large enough to detect the bias toward positive outcomes and the effect of experimental manipulation, we believe that more data were required to fully discern the role of prior affective states in relation between optimism and judgments of future events. On the other hand, a more refined procedure also involving experimental manipulation may be necessary to capture the role of affective states on the relation between optimism and judgments about future life events. Thirdly, the affective states' impact could be moderated by other interposed variables, such as perceived control (Lerner and Keltner 2001) or perceived personal relevance of events used to experimentally induce positive and negative experience (Ferguson and Sheldon 2013; Schwarz 1998). The question related to the way affective states may influence the judgments of future life events requires further empirical and theoretical consideration.

This current investigation offers some insights into the relation among dispositional optimism, judgments of future life events and affective states. Firstly, our study examined judgments for both negative and positive events offering a more complete picture of the phenomenon; earlier studies focused more on judgments about negative events and less about positive events (see Shepperd et al. 2013 for review; Harris and Hahn 2011). Secondly, our research showed that optimism, as a personality trait, is directly related to judgments of both future positive and negative life events; optimistic people tend to consider that more positive events will happen to them in the future, and they tend to believe that fewer negative events could happen. Thirdly, we investigated whether the correlation between dispositional optimism and judgments of future events is moderated by affective states; previous studies partially explored the relation between the analysed concepts—optimism, judgments about the likelihood of future life events and mood. By manipulating affective states and exploring their moderating role in the relation between optimism and judgments of future events, we extended the findings from earlier investigations. By examining the relation between dispositional optimism, affective states and judgments of future life events, the current studies provided some insights into the relation between these variables, which can help to better understand the ways in which

personality, especially dispositional optimism, could influence people's thinking about the future. Fourthly, our data revealed an unexpected finding, regarding the adaptative nature of a positive affective state in reducing the judgments of future positive events in people with a high level of optimism. This result is particularly important given the fact that the positive affective state was recently considered a source of unrealistic distortions of cognitive processing of judgments (Forgas 2013; Gruber et al. 2011). As our study reveals, its role should be interpreted by reference to individual personality traits, particularly to dispositional optimism.

Although more research is needed to clarify the psychological processes that may account for the influence of optimism and affective states on judgments of events, this current study facilitates the understanding of how these factors interact to determine the interpretation of judgments of future life events. Such findings may help researchers select the information in order to encourage a healthy and safe behaviour and to develop interventions for assisting people in order to increase their own role in taking control after having experienced negative events. Thus, cognitive therapists may help young people become more optimistic, may instruct them to adopt more constructive beliefs when they are faced with difficult situations or to develop their social problem-solving skills.

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