



Can positive affect “undo” negative affect? A longitudinal study of affect in studying

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ABSTRACT

Drawing from the view that positive and negative emotions are incompatible within momentary experience, it was hypothesized that positive affect in studying would prevent subsequent negative affect in studying. A sample of 126 college students completed the Positive and Negative Affect Schedule – Short Form with reference to their current experience when studying on two occasions 3 months apart. Mediation modeling revealed a proximal indirect effect, in that positive affect prevents negative affect at baseline, and the reduction effect carries on over time, and a less enduring distal indirect effect, in that positive affect at baseline fosters subsequent positive affect, which in turn prevents negative affect. The findings support the hypothesis and provide indications for research aiming at reducing negative affect in studying.

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1. Introduction

Affect is a general term representing positive or negative subjective experience occurring at a given moment in time (Wyer, Clore, & Isbell, 1999), and it is a conceptual umbrella for both moods and emotions, mapping them onto a bipolar (positive–negative) *valence* dimension and differentiating them according to their level of *activation* (high–low) (Russell & Carroll, 1999). Positive affect includes emotions such as joy, love, and contentment, and negative affect includes emotions such as fear, anger, and sadness. Positive affect and negative affect were initially regarded as relatively independent constructs (Diener & Emmons, 1984). The interest in the relationship between the two affective states has recently grown as studies showed that positive emotions play an important role in the regulation of negative emotions (Tugade & Fredrickson, 2004), and buffer the aversive effects of stress (Folkman, 2008).

The Broaden and Build Model of Positive Emotions (Fredrickson, 1998, 2001) is the main theoretical approach that explains the relationship between positive and negative emotions. The model states that negative emotions narrow one's cognition and behavior, and this narrowing is adaptive only when one confronts a real and immediate threat (Cohn, Fredrickson, Brown, Mikels, & Conway, 2009). The model advances three hypotheses: (1) the *broaden*

hypothesis, which states that positive emotions expand one's attention (Gasper & Clore, 2002), cognition (Fredrickson & Joiner, 2002) and behavioral repertoires (Johnson & Fredrickson, 2005); (2) the *build hypothesis*, which advocates that even short-lived positive emotions may have long-term effects by enhancing physical, psychological, cognitive, and social resources (Cohn et al., 2009); (3) the *undoing hypothesis*, which contends that positive emotions function as an antidote for negative emotions in that they correct or diminish their deleterious influence (Fredrickson, 2001).

The undoing hypothesis was tested with regard to the physiological impact of negative emotions in experiments (Fredrickson & Levenson, 1998; Fredrickson, Mancuso, Branigan, & Tugade, 2000; Tugade & Fredrickson, 2004). These experiments induced negative emotions in order to increase cardiovascular reactivity using a time-pressured speech preparation task. Participants were then randomly distributed in four groups in order to watch one of the films that elicited contentment, amusement, sadness, or neutrality. Consistent with the undoing hypothesis, films inducing contentment or amusement produced a faster cardiovascular recovery than those inducing sadness or neutrality. The undoing hypothesis was also tested using longitudinal study designs in real-life contexts. For example, a recent experience sampling study conducted on workers measured positive and negative affect at work for two consecutive weeks and job satisfaction at the end. Consistent with the undoing hypothesis, the study found that (a) negative affect was negatively associated with job satisfaction and (b) positive affect mitigated the association (Dimotakis, Scott, & Koopman, 2011).

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This study investigates a more basic undoing process: Can positive affect in a specific domain of activity “undo” negative affect in the same domain of activity, so that, an increase in positive affect at time 1 will be followed by a decrease of negative affect at time 2? The rationale for this research question is threefold. First, although positive affect and negative affect are relatively independent variables when measured as means over repeated observations (e.g., gathered via experience sampling method or end-of-day diaries) they tend to be negatively associated within momentary experience (Russell & Carroll, 1999). Second, there is agreement among researchers that, within momentary experience, positive emotions are incompatible with negative emotions in that the affective system cannot be simultaneously broadened and narrowed, nor be both self-protective and self-expanding (Garland et al., 2010). Finally, the induction of positive affect when one experiences negative affect has been used for decades in the systematic desensitization of maladaptive negative emotions (Wolpe, 1958), and found to be effective in reducing domain-dependent negative affect, including study-related anxiety (Zettle, 2003). Therefore, it is possible that experiencing positive affect in temporal proximity with negative affect in a context of activity such as study or work may result in experiencing less negative affect in that context at a later time.

The research question is addressed on the emotions university students experience in studying. Research on *study burnout* – which signifies a tendency to experience negative affectivity while studying in the form of *exhaustion*, *cynicism*, and *inefficacy* – and *study engagement* – which signifies a tendency to experience positive affectivity while studying in the form of *vigor*, *dedication*, and *absorption* – suggest that positive and negative affect influence university students' commitment to their study program and academic performance (Salanova, Schaufeli, Martínez, & Bresó, 2010). Therefore, positive affect and negative affect experienced when engaged in study activities are practically relevant constructs in educational research.

This study adopted the simplest two-wave longitudinal design, in which positive and negative affect in studying were measured at two different points in time, whose temporal distance differed across participants and averaged around 3 months. Within such design, the undoing effect can be disentangled, with reference to the path diagram shown in Fig. 1, into the following three hypotheses:

- (H1) Time 1 positive affect will prevent time 2 negative affect through the mediation of time 1 negative affect (path a_1b_1).

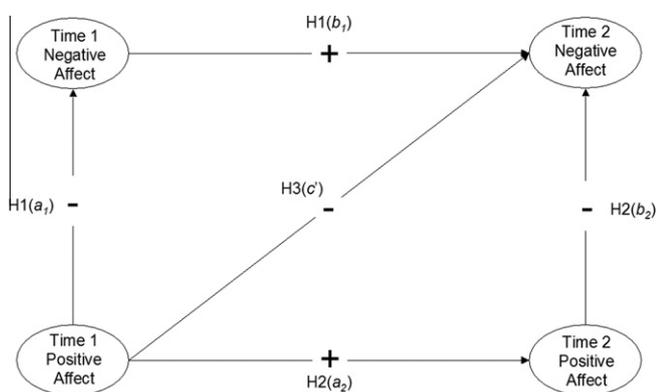


Fig. 1. Hypothesized multiple mediator model of time 2 negative affect stating that (H1) time 1 negative affect partially mediates the undoing effect of time 1 positive affect on time 2 negative affect, (H2) time 2 positive affect partially mediates the undoing effect of time 1 positive affect on time 2 negative affect, and (H3) time 1 positive affect has a direct undoing effect on time 2 negative affect. Note: The + and – signs represent positive and negative relationships, respectively.

- (H2) Time 1 positive affect will prevent time 2 negative affect through the mediation of time 2 positive affect (path a_2b_2).
- (H3) Time 1 positive affect will directly prevent time 2 negative affect (path c').

Hypothesis 1 states a proximal indirect effect, in that positive affect prevents negative affect at baseline, and the reduction effect carries on over time. Hypothesis 2 states a distal indirect effect, in that positive affect at baseline fosters subsequent positive affect, which in turn prevents negative affect. Hypothesis 3 states a distal direct effect in that baseline positive affect prevents subsequent negative affect; this hypothesis is not grounded in theories of emotions and hence is tested only for completeness.

The first goal of this study is to test the hypotheses in a single model. The second goal is to assess the duration of the hypothesized undoing effects, if present. The third goal is to assess whether the hypothesized undoing effects a_1 and a_2 are linear functions of time 1 positive affect and time 2 positive affect, respectively – and hence independent of baseline positive affect – or are concave down functions – and hence reduced for high levels of baseline positive affect.

2. Method

2.1. Participants

Potential participants were approached in common university areas such as libraries and cafeterias of a large London university belonging to the group of so called “new universities” that in the United Kingdom offer comparatively more enrollment opportunity to mature students. The data collection was conducted in two consecutive semesters, each comprising 11 weeks of formal teaching plus one revision week, which is followed by a three-week examination period. In the first semester, all participants were briefed individually, provided informed consent, and completed a demographic datasheet and a questionnaire pack including the instrument described in the next section (time 1). In the second semester, participants were invited by email to come to a lab to complete the same questionnaire pack a second time (time 2).

Because a single invitation for the time 2 participation was sent, non-response at time 2 was high. The time 1 sample comprised 419 students. The time 2 sample comprised 126 students. The time 2 sample and the non-respondent sample did not differ in the time 1 means of positive affect and negative affect, gender, ethnicity and subject of a degree. Yet, respondents were older (age of respondents: $M = 28.87$, $SD = 10.13$; age of non-respondents: $M = 24.69$, $SD = 6.63$; $t = -4.27$, $p < .001$) and more senior than non-respondents (year of studying of respondents: $M = 2.64$, $SD = 1.49$; year of studying of non-respondents: $M = 2.01$, $SD = 1.45$; $t = -4.06$, $p < .001$).

Only the 126 participants who completed both study waves were included in the data analysis of the present study. The follow-up time ranged from 17 days to 192 days ($M = 95.90$, $SD = 32.76$). The age range was 17 to 62 years; 23 (18.3%) were males, 103 (81.7%) were females. The largest ethnic group in the sample was White (81 participants; 64.3%), followed by Black (12 participants; 9.5%), Indian (7 participants; 5.6%) and other or mixed ethnic groups (26 participants; 20.6%). There were 44 science students (34.4%), 31 business students (24.2%), 29 humanities students (22.7%), 14 social science students (10.9%) and 10 students withheld the information about their course of studying (7.8%).

2.2. Measures

Participants completed the Positive and Negative Affect Schedule (PANAS) – Short Form (I-PANAS-SF; Thompson, 2007). The

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