



When is affect variability bad for health? The association between affect variability and immune response to the influenza vaccination

Brooke N. Jenkins^{a,*}, John F. Hunter^b, Marie P. Cross^b, Amanda M. Acevedo^b, Sarah D. Pressman^b

^a Chapman University, Department of Psychology, United States

^b University of California, Irvine, Department of Psychology and Social Behavior, United States

ARTICLE INFO

Keywords:

Affect variability
Antibody response
Immune function
Negative affect
Positive affect

ABSTRACT

Objectives: This study addresses methodological and theoretical questions about the association between affect and physical health. Specifically, we examine the role of affect variability and its interaction with mean levels of affect to predict antibody (Ab) levels in response to an influenza vaccination.

Methods: Participants ($N = 83$) received the vaccination and completed daily diary measures of affect four times a day for 13 days. At one and four months post-vaccination, blood was collected from the participants to assess Ab levels.

Results: Findings indicate that affect variability and its interaction with mean levels of affect predict an individual's immune response. Those high in mean positive affect (PA) who had more PA variability were more likely to have a lower Ab response in comparison to those who had high mean PA and less PA variability. Although it did not interact with mean negative affect (NA), NA variability on its own was associated with Ab response, whereby those with less NA variability mounted a more robust immune response.

Conclusion: Affect variability is related to immune response to an influenza vaccination and, in some cases, interacts with mean levels of affect. These oscillations in affective experiences are critical to consider in order to unpack the intricacies of how affect influences health. These findings suggest that future researchers should consider the important role of affect variability on physical health-relevant outcomes as well as examine the moderating effect of mean affect levels.

1. Introduction

Positive affect (PA), such as feelings of joy or happiness, has been repeatedly tied to better health and physiological function [1–3], while the converse is true of negative affect (NA; e.g., feelings of sadness or anger; [4]). The majority of this research has evaluated affect in a singular fashion: by assessing mean or average levels of affect. This ignores the interesting possibility that naturally occurring changes in affect over time, uncaptured by averages, might also have biological relevance [5].

Fluctuations in the experience of affect over time are referred to as affect variability. This construct captures the idea that an individual who varies between extreme highs and lows on NA, for example, is starkly different from an individual with consistently moderate levels of NA. These two individuals could have the same mean level of NA, however, and would therefore be considered equal in many past studies about state affect and physical health (see Fig. 1). Without consideration of variability, invaluable information about nuances in affect is

lost. Critically, with knowledge of the interplay between transient affect and alterations in physiology (e.g., heart rate, blood pressure, immune function; [6,7]), it seems plausible that these variability differences may have physical health-relevant consequences.

A substantial body of evidence suggests that affect variability may be associated with worse mental health (see meta analytic review [8]). For example, Gruber and colleagues [9] found that greater PA variability was associated with lower life satisfaction, worse psychosocial functioning, and greater depression and anxiety. These findings held even when controlling for mean affect, indicating that variability may predict mental health over and above mean levels of affect. In the same paper, retrospectively captured affect variability in a separate large sample showed that greater PA variability was associated with lower life satisfaction and subjective happiness. Similar to these findings, Hardy and Segerstrom [10] found that middle-aged participants with greater variability in both PA and NA experienced greater psychological distress even when controlling for each respective mean level of affect. These findings indicate that greater affect variability is detrimental to

* Corresponding author at: Crean Hall 110, Orange, CA, United States.

E-mail addresses: bjenkins@chapman.edu (B.N. Jenkins), jhunter1@uci.edu (J.F. Hunter), mpcross@uci.edu (M.P. Cross), aceveda1@uci.edu (A.M. Acevedo), pressman@uci.edu (S.D. Pressman).

<https://doi.org/10.1016/j.jpsychores.2017.11.002>

Received 21 May 2017; Received in revised form 26 October 2017; Accepted 3 November 2017
0022-3999/ © 2017 Elsevier Inc. All rights reserved.

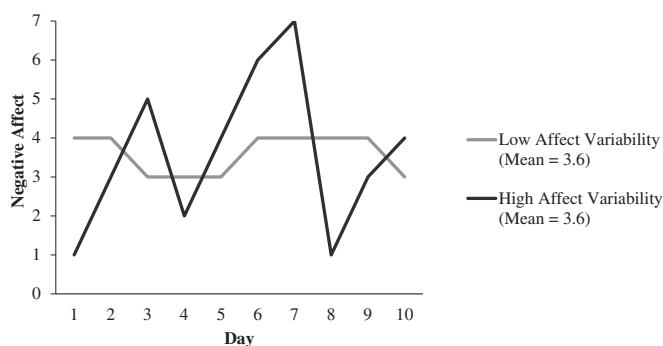


Fig. 1. Two individuals with the same mean level of negative affect but different negative affect variability.

mental health.

While this evidence provides convincing support that affect variability has implications for psychological health, there is a near absence of work examining how affect variability may impact physical health-relevant outcomes. Indeed, variability in other psychological characteristics (e.g., life satisfaction, perceived control) is associated with a variety of physical health outcomes such as higher mortality risk and worse physical health, and physical health-relevant factors such as lower social support [11–13]. There is also the possibility that variability in affect has a physiologically taxing effect on the body. For example, given the known cardiovascular, immune, and hormonal alterations with even subtle affect change (e.g., [14–17]), variability may take additional energy due to repeated physical adjustments. Alternatively, one could argue that variability is healthful given that it provides activated physiological systems a break, which prevents biological exhaustion and wear and tear on these systems (e.g., [18,19]). Although these predictions suggest affect variability may be tied to physical health, a surprising aspect of the current variability literature is the lack of inclusion of objective health-relevant biomarkers. To our knowledge, only one study has examined the association between affect variability and a health-relevant biomarker, finding that moderate levels of PA variability were related to daily cortisol profiles that are reflective of better physiological functioning [20]. If we are to better understand the toll affect variability takes on physical health, we must continue to study objective markers of health.

One health-relevant biomarker that may be important in regard to affect variability is antibody (Ab) response to a vaccination, such as the influenza vaccine. Ab response, typically assessed via blood samples, is often used to study how psychosocial factors impact in vivo immune function [21–23]. Given the importance of a quick and large rise in Ab to ensure protection against virus exposure [22], vaccination response provides us with a health-relevant indicator of immune functioning. For the influenza vaccine, Ab increases one month post-vaccination represent the maximum response, while Ab levels after that time represent the extent to which the Ab increase is sustained versus declined (e.g., [24]). Critically, affect variability experienced immediately following vaccination might have physiological implications that may be associated with these Ab levels.

In addition to the limitation of the lack of health-relevant biomarkers, previous affect variability and health research has also not included interaction terms between affect variability and mean levels of affect. This may be important because variability may have different implications based on mean levels [25]. For example, an individual with high mean PA may benefit from low variability because he or she would experience consistently high levels of PA. On the other hand, an individual low on mean PA may benefit from high variability because he or she could at least experience some instances of high PA, which could provide temporary benefits. However, this also means that he or she will be experiencing instances of extremely low PA when he or she drops far below his or her already low PA level. For NA, similar

instances could occur. Individuals with high mean NA may benefit from high variability because this provides “breaks” in NA (when they drop below their usually high NA levels), while those low in mean NA may benefit from low variability so that they stay consistently low on NA. As noted by these examples, the combination of these potential interaction effects may have a profound impact on how affect influences health. Although affect papers have not tested this interaction, one study investigated the interaction between variability and mean levels of life satisfaction (which is only moderately correlated with affect [26]) and showed that greater variability was associated with an increase in mortality risk, especially for those with low mean life satisfaction [11].

The goal of the present study is to examine how affect variability is associated with Ab response to an influenza vaccination. This study fills important gaps in the literature by employing a fine-grained methodology to assess affective experiences, measuring a novel health-relevant biomarker that provides rich information about immunocompetence, and examining previously unexplored interaction effects. Affect variability was measured using the common standard deviation approach (similar to the methods used by the papers reviewed above). This method is advantageous in that it represents affect variability with a single value that is widely used and understood [27–29]. We interacted mean affect with affect variability to uncover whether affect variability has different implications for physical health at different levels of mean affect.

2. Method

2.1. Participants

Participants included 83 undergraduate students ($M_{age} = 18.29$; $SD_{age} = 0.90$; 44% male). Sixty-six percent were White/of European American background, 24% were of East Asian background, and 10% reported other or mixed racial/ethnic background. Participants were eligible for participation if they were healthy (i.e., no chronic or acute illnesses), were not on a regular medication regimen (with the exception of birth control), had never been vaccinated for influenza, and were not pregnant or breastfeeding. Participants were compensated \$120. All study procedures were approved by the university Institutional Review Board.

2.2. Procedures

Participants were run in two cohorts across the fall in consecutive years. Participation in the study lasted for four months. Participants first completed baseline measures and then completed daily diaries four times a day for 13 consecutive days. Data were collected on a handheld computer which alerted participants to complete questionnaires one hour after their wake time and then three, eight, and 10 h later. On day three, participants received the flu vaccination at a university flu clinic. Before receiving the vaccination, blood was collected to measure baseline Ab levels. At one and four months post-vaccination, blood was again collected from the participants to assess Ab levels.

2.3. Measures

2.3.1. Daily affect

Affect was assessed with a checklist of 12 adjectives adapted from the State Adjective Questionnaire [30,31]. Participants reported how much each adjective represented their current affect at each of the diary entries. NA was assessed with the items jittery, nervous, unhappy, and sad. PA was assessed with the items active, intense, enthusiastic, lively, happy, cheerful, relaxed, and calm. NA and PA items were rated on a scale from 0 (Not at all) to 4 (Extremely). Cronbach's alphas for NA ranged from 0.56 to 0.84 and Cronbach's alphas for PA ranged from 0.68 to 0.85 across the four time points over the 13 days.

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات