Idiographic Dynamics of Positive Emotion in GAD: Modeling Emotion Regulation at the Person
Level

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Abstract

GAD is associated with worry and emotion regulation difficulties. The contrast-avoidance model suggests that individuals with GAD use worry to regulate emotion: by worrying, they maintain a constant state of negative affect (NA), avoiding a feared sudden shift into NA. We tested an extension of this model to positive affect (PA). During a week-long EMA period, 96 undergraduates with a GAD analog provided four daily measurements of worry, dampening (i.e. PA suppression), and PA. We hypothesized a time-lagged mediation relationship in which higher worry predicts later dampening, and dampening predicts subsequently lower PA. A lag-2 structural equation model was fit to the group-aggregated data and to each individual time-series to test this hypothesis. Although worry and PA were negatively correlated in 87 participants, our model was not supported at the nomothetic level. However, idiographically, our model was well-fit for about a third (38.5%) of participants. We then used automatic search as an idiographic exploratory procedure to detect other time-lagged relationships between these constructs. While 46 individuals exhibited some cross-lagged relationships, no clear pattern emerged across participants. Findings suggest heterogeneity in the function of worry as a regulatory strategy, and the importance of temporal scale for detection of time-lagged effects.

Introduction

Studying emotion and emotion regulation with methods like ecological momentary assessment (EMA) presents unique challenges. For example, with individual differences in how people experience and regulate emotion (John & Gross, 2007) what models are appropriate for potentially heterogeneous effects? A recent paper demonstrated that group-level models often lead to inaccurate inferences about individuals (Fisher, Jeronimus, & Medaglia, 2018); idiographic approaches may be optimal for the study of emotion and emotion regulation in daily life, enabling detection of person-specific emotion profiles rather than washing them out as noise.

To illustrate this point, the present paper examines suppression of positive affect (PA) – known as *dampening* – in adults with generalized anxiety disorder (GAD). We present a novel framework for theory testing in clinical science. Specifically, we propose that if a theory makes specific, testable hypotheses about the structure and function of emotion (or other time-varying processes) within individuals, those processes should be modeled and tested in individuals, on a case by case basis. In this way, we can evaluate accuracy of the theory's predictions about *individual* phenomenology and behavior. In the present paper, we apply this approach to the contrast-avoidance model of worry (Newman & Llera, 2011). From this model, we posit that dampening mediates the relationship between worry and PA. Thus, the specific hypothesis is increased levels of worry will lead to an increase in dampening and a subsequent decrease in PA. Because the theory makes predictions about temporal relationships between constructs as they unfold at the level of the person, the processes under investigation should be examined idiographically.

GAD and Emotion Regulation

For individuals with GAD, emotions are often intense, confusing, and uncontrollable. Relative to controls, GAD patients report greater intensity, poorer understanding, decreased acceptance, and less effective regulation of their emotions (Mennin, Heimberg, Turk, & Fresco, 2005). Perhaps for these reasons, those with GAD fear *losing control* of their emotions (Roemer, Salters, Raffa, & Orsillo, 2005), and may show tendencies to avoid or seek control during an intense emotional experience (Turk, Heimberg, Luterek, Mennin, and Fresco, 2005). Given these patterns, some have begun to conceptualize GAD as a disorder of emotion regulation (Salters-Pednault, Roemer, Tull, Rucker, & Mennin, 2006) and new therapeutic approaches have been developed specifically to target this mechanism in GAD (e.g. *Emotion Regulation Therapy*, Fresco, Mennin, Heimberg, & Ritter, 2013).

Worrying is the cardinal symptom of GAD (APA, 2013). A handful of theories suggest that worry functions as an emotion-regulation strategy in GAD, explaining its prevalence in this population. One theory proposes worry serves a distraction function, giving people with GAD a way to avoid negative affect (NA) by perseveratively thinking about a problem (Borkovec & Roemer, 1995). However, recent evidence suggests people with GAD seek to avoid a sudden *change* in NA more than they avoid NA itself (Llera & Newman 2010, 2014). As a participant with GAD from the present study put it,

“If I know I’m going to feel sad, that’s ok – I can plan for it, and it won’t be a surprise to me. But if I suddenly feel sad out of the blue when I was fine before, then things are totally out of my control and I might just lose it.”

In the *contrast-avoidance* model of GAD (Newman & Llera, 2011), a consistent state of NA is preferable to a sudden spike in NA. Even neutral affect may feel threatening, given its

potential to yield an emotional contrast. Worry may therefore feel helpful, even though it doesn't feel *good*: in this model, worry promotes a sustained state of "pre-planned" NA, lowering the likelihood of a sudden emotional contrast. Llera & Newman (2010, 2014) provided empirical support for this possibility in a laboratory setting where GAD patients and controls engaged in either a worry-induction, relaxation-induction, or neutral-affect induction prior to viewing emotion-inducing film clips. Across participants, worrying before a NA-inducing clip led to greater *pre-clip* NA; thus, the NA experienced *during* the clip represented less of a contrast. Participants with GAD reported that worrying before the negative clips was helpful in coping with the NA exposures, while controls reported the opposite (worrying before the clips *increased* their distress.) This suggests worrying is a reliable strategy to upregulate NA, and individuals with GAD might use this strategy to avoid a potentially distressing emotional contrast.

It follows that those with GAD would also fear or avoid PA: feeling positive sets up the potential for an even sharper emotional contrast if a NA state were suddenly to arise. Indeed, individuals with GAD endorse fears and catastrophic beliefs regarding PA (Mennin, et al., 2005; Turk, et al., 2005). For example, engaging with PA sets one up for disappointment later, or feeling good might distract and prevent one from getting things done.

Such beliefs may result in less PA for GAD patients, and there is evidence that those with GAD show diminished expression of PA (Turk et al., 2005). Further, epidemiological evidence suggests a GAD diagnosis is associated with lower self-reported PA (Bosley, Fernandez, & Fisher, under review). A plausible hypothesis is that individuals with GAD dampen PA as a contrast-avoidance regulation strategy. Supporting this possibility, a study by Eisner and colleagues (2009) explored responses to PA across anxiety disorders, showing GAD symptoms are positively associated with the tendency to dampen or suppress PA. As an example of

dampening, individuals might engage in thoughts like “I don’t deserve this” or “this will never last” when experiencing PA. Taken together, it is imperative to better understand the role of PA in GAD. Moreover, given the degree to which PA heightens the risk of a sudden and severe contrast in experienced affect, better delineating its role in contrast-avoidance is paramount.

The present study therefore sought to extend the contrast-avoidance model in a way that better addresses PA, testing whether individuals with GAD use worry to avoid or downregulate PA. In the aforementioned film-clip studies of this model (Llera & Newman, 2010/2014), worrying before a NA-inducing clip led to increased pre-clip NA, but worrying before *positive* clips did not inhibit the effects of PA induction. That is, worrying did not lead to immediately-observable decreases in PA in the same way that it led to increases in NA. Thus, while worry has a direct effect on NA, perhaps worry would affect PA through a more indirect pathway – otherwise, worrying would have inhibited PA inductions. Considering that anxiety is associated with tendencies to dampen PA (Eisner et al., 2009), we hypothesize a mediation pathway in which worrying leads to dampening (as a contrast-avoidance behavior) and then dampening in turn leads to lower PA.

In the present study, we recruited a university sample of persons with a GAD analog. Such a sample is consistent with the participants in Llera and Newman’s previous work. Participants completed smartphone-based EMA surveys four times per day for one week, which measured worry, dampening, and PA. We hypothesized a time-lagged mediation relationship in which worry (at time $t-2$) would positively predict dampening at the next assessment ($t-1$), and dampening would negatively predict PA at the following assessment (t).

We tested our mediation hypothesis by fitting a structural equation model (SEM) to the time-series data resulting from EMA. Our hypothesis makes predictions about how worry,

dampening, and PA unfold over time, within an individual, so our collection of time-series data and application of a time-lagged SEM reflects the idiographic and dynamic nature of the present hypothesis. We fit our SEM to a nomothetic covariance matrix (aggregating across individual time-series) to establish whether the hypothesized mediation relationship is a group-level pattern. We then tested this model idiographically, fitting the hypothesized model to each person's time-series. Finally, we utilized an exploratory modeling approach in each individual time-series, to detect other person-specific time-varying patterns between worry, dampening, and PA.

Methods

Participants

A total of 1,080 potential participants from the undergraduate research participation pool at a large public university completed the Penn State Worry Questionnaire (PSWQ). A high-worry subset of these participants (n=425) were emailed and offered participation in our study in exchange for partial course credit. Our selection criterion was a score of 56 or higher, which has been shown to distinguish likely diagnosis of GAD in a college sample (cf. Ruscio, 2002). Of these, 108 enrolled and 96 participants completed all parts of the study. The final sample (n=96) included 84 females (87.5%), 31 White, 43 Asian, 16 Latino/a, 1 Black, 4 Native American/Pacific Islander, and 1 other. The average age was 19.6 years, ranging from 18 to 27.

Procedure

Participants attended an initial one-hour lab visit where they completed self-report measures and were introduced to the smartphone-based EMA system. During the following week, EMA surveys were sent to participants via SMS text message four times per day, approximately every four hours (customized to participants' self-reported wake-up time). Each survey contained 26 items measuring worry, dampening, PA and NA. Participants rated their

experience of these constructs over the preceding four hours, using a 0-100 analog slider. Items were presented in a random order in each survey. Participants who demonstrated insufficient compliance with the surveys were sent email reminders.

Measures

Penn State Worry Questionnaire (Meyer et al, 1990). The PSWQ is a 16-item self-report instrument that has been found to distinguish individuals from a college sample who meet diagnostic criteria for GAD. It has strong criterion group validity, as individuals with GAD were shown to score significantly higher than non-GAD controls or controls with a PTSD diagnosis.

Worry. Worry was assessed as a composite of three items: *felt worried frequently*, *felt that worry is difficult to stop or control*, and *felt that worry is interfering with your life*.

Participants were instructed to rate these items based on the elapsed time between the last survey and the current one. These items captured the domains of frequency, controllability, and functional consequences of worry, consistent with DSM–5 GAD diagnostic criteria (APA, 2013).

Dampening. The Response to Positive Affect Scale (RPA; Feldman, Joorman, and Johnson, 2008) is a 17-item measure of cognitive response tendencies when experiencing PA. To capture dampening responses in the moment, we utilized its 8-item dampening subscale with a state (vs. trait) framing of the items (e.g. *since the last survey, when you felt happy, to what extent did you...*). Items included things like *remind yourself that these feelings won't last*; *think "I don't deserve this"*; and *think about things that could go wrong*.

Positive Affect. PA was measured as a composite of three items: *felt happy*, *felt excited*, and *felt content*. These items were chosen to capture neutral, high, and low arousal exemplars of PA (respectively; Russell & Barrett, 1999; Tsai, Knutson, and Fung, 2006).

Data Analytic Procedure

Data preparation. Each individual's time series was detrended by taking the residuals of each variable (worry, dampening, and PA) regressed on linear continuous time. Cubic spline interpolation was then applied to detrended data to obtain equal spacing. For each individual's time series, each variable was lagged by two observations, to provide values for time point (t) and the two preceding time points ($t-1$ and $t-2$). Lag-2 block-Toeplitz covariance matrices were generated for each individual; these idiographic covariance matrices were then averaged to yield a nomothetic covariance matrix. Contemporaneous correlations between worry, dampening, and PA were estimated for each individual.

Nomothetic model. To test our mediation hypothesis at the nomothetic level, a lag-2 vector-autoregressive model was constructed and fit to the group aggregated covariance matrix, in LISREL 8.8 (Jöreskog & Sörbom, 2006). To construct this model, all autoregressive paths were freed (e.g., worry at $t-2$ predicting worry at $t-1$, worry at $t-1$ predicting worry at t). To test the hypothesized mediation relationship, paths were freed for worry at $t-2$ predicting dampening at $t-1$, and dampening at $t-1$ predicting PA at t . In addition, we allowed paths to test the competing directional hypothesis, PA at $t-2$ predicting dampening at $t-1$, and dampening at $t-1$ predicting worry at t (see Figure 1). Model fit was determined using the root mean square error of approximation (RMSEA) < 0.08, the comparative fit index (CFI) > 0.95, and the non-normed fit index (NNFI) > 0.95 (Hu & Bentler, 1999).

[Insert Figure 1 here]

We also tested a simpler alternative model in which only the autoregressive paths were freed, and used an exploratory data-driven approach via automatic search to determine which cross-lagged paths significantly improved model fit. The automatic search function uses the Lagrange multiplier test to detect relative change in a model's chi-square value after adding a

given parameter. Using this procedure, LISREL is programmed iteratively to add parameters that significantly improve fit, beginning with the parameter that yields the greatest improvement. Parameters are no longer added when Lagrange multiplier tests reveal that there is no parameter that will improve model fit beyond a user-specified threshold (here, we stopped adding parameters when the expected change in the Chi-square statistic was <4 for all possible paths).

Idiographic models. We fit the hypothesis-driven lag-2 SEM (Figure 1) to each individual's time series, yielding 96 person-specific models. Fit of each model was evaluated based on RMSEA, CFI, and NNFI. A well-fitting idiographic model indicates that the time-varying relationships in that individual's time-series data were structurally consistent with the proposed lag-2 mediation model; for such a person, worry leads to dampening, and dampening leads to change in PA. This approach allowed us to examine individual differences in the extent to which our hypothesized model fits for each person.

We then took an exploratory, data-driven approach to detect other possible relationships between worry, dampening, and PA in each individual time-series. Similar to the automatic search procedure in the nomothetic model, we began with an autoregressive structure, and used automatic search to iteratively add lagged paths until no modification indices >4 remained.

Results

Survey Response and Contemporaneous Correlations

Participants completed an average of 24.2 observations during the week-long EMA period, ranging from 8 to 45. Bivariate contemporaneous correlations between worry, dampening, and PA (estimated for each person) showed pronounced variability across the sample. Within-person correlations between worry and dampening ranged from -0.34 to 0.91 ($M=0.26$), correlations between dampening and PA ranged from -0.88 to 0.63 ($M=-0.14$), and

correlations between worry and PA ranged from -0.88 to 0.61 ($M=-0.33$). Worry and dampening were positively correlated in 78 participants (81.3%) and dampening and PA were negatively correlated in 67 participants (69.8%). Summary statistics and histograms of within-person contemporaneous correlations are presented in Table 1 and Figure 2, respectively.

[Insert Table 1 and Figure 2 here.]

Nomothetic Model

Although the lag-2 mediation model showed excellent fit to the group-aggregated data ($RMSEA<.001$, $SRMR=0.04$, $NNFI=1.00$), coefficients for the hypothesized mediation paths were quite small, nearly approaching zero (see Table 2). When the four cross-lagged paths were removed, the model maintained excellent fit according to all criteria ($RMSEA<.001$, $SRMR=0.04$, and $NNFI=1.00$), and no modification indices >4 emerged from automatic search. Thus, at the group level, our model showed an exclusively autoregressive structure: across the sample, worry, dampening, and PA significantly predicted themselves over time, but these variables did not exhibit significant cross-lagged relationships.

[Insert Table 2 here.]

Idiographic Models

We then fit the hypothesized lag-2 mediation model to each idiographic covariance matrix, one person at a time. This model was well-fit to 37 of the 96 participants' datasets (38.5%) according to all criteria. For the remaining 59 participants, the hypothesized model demonstrated poor fit.

Next, we conducted an exploratory, data-driven procedure via automatic search to detect which lagged relationships between worry, dampening, and PA emerged from each individual dataset. Of these 96 exploratory models, 50 (52.1%) revealed an exclusively autoregressive

structure (similar to the nomothetic exploratory model). The remaining 46 individuals exhibited at least one cross-lagged path between worry, dampening, and PA, with pronounced variability across participants. Of these, only *one* (participant 50) reflected both of the lagged paths predicted by our mediation model. Frequencies of lagged paths are reported in Table 3.

[Insert Table 3 here.]

Discussion

Drawing on the contrast-avoidance model of worry (Newman & Llera, 2011), and evidence that individuals high in anxiety tend to dampen or suppress PA (Eisner et al, 2009), we hypothesized a lag-2 mediation relationship between worry, dampening, and PA such that worrying would lead to subsequently greater dampening of PA, and that dampening would lead to subsequent decreases in PA. We first tested this model at the group-aggregated level. Next, we examined these relationships within each individual over time. We also utilized an exploratory data-driven approach to detect which time-varying paths between worry, dampening, and PA improve model fit for each individual.

At the group level, our mediation hypothesis was not supported. Although the lag-2 mediation model showed excellent fit to the group-aggregated data, the only parameters of statistical significance were autoregressive paths, indicating that worry, dampening, and PA each predict themselves at subsequent points in time. When the hypothesized cross-lagged paths were removed, no modification indices for those paths emerged, and the autoregressive model maintained excellent fit. Taken together, this suggests that our mediation hypothesis was not supported when aggregating across participants.

At the idiographic level, the hypothesized SEM exhibited good fit in 37 (38.5%) of participants. This model did not fit well for the remaining 59. In the subsequent exploratory step,

we observed heterogeneity in the presence of cross-lagged paths, and in the strength and direction of these paths when present. For fifty participants, worry, dampening, and PA were only autoregressive (consistent with the nomothetic analyses), while 46 others had at least one cross-lagged path between these constructs.

Only *one* participant exhibited the hypothesized mediation relationship between worry and low PA, as evidenced by significant lagged paths from worry at $(t - 2)$ to dampening at $(t - 1)$, and dampening at $(t - 1)$ to PA at (t) . However, this participant was the exception to the rule: at the individual level, the data largely do not support the hypothesized mediation model. Our hypothesized lag-2 structure was so rare in this sample that we can conclude it likely would not generalize to a broader population of chronic worriers. Thus, neither the nomothetic nor the idiographic levels of analysis yielded support for our hypothesis.

We focus on two possible explanations for these findings as they relate to future theory, research studies, and clinical application. First, we observed pronounced heterogeneity in the time-varying patterns between worry, dampening, and PA. This suggests that attempting to draw group level conclusions about the nature and function of these processes (e.g. “worry serves X function in Y population”) may be a sub-optimal approach if the goal is to understand the nuances of how these constructs change and affect each other over time. Perhaps in this case, a more accurate picture is one of idiosyncrasy. Second, disagreement between the contemporaneous correlations and the lag-2 models highlights the importance of temporal scale. It is likely that constructs in the present study change -- and influence one another --very quickly over time, in a way that might not be detectable with a four-hour lag between measurements.

Addressing Idiosyncrasy

The present findings point to heterogeneity in the time-varying dynamics between worry, dampening, and PA. While a majority of the sample showed negative contemporaneous correlations between worry and PA, no clear lag-1 or lag-2 patterns emerged across participants. Instead, we observed pronounced variation in the presence, strength, and direction of time-lagged relationships between worry, dampening, and PA. We may be able to glean a deeper understanding of contrast-avoidance processes from examining the nuances of the individual models as constructed from automatic search. Consideration of individual cases may tell us valuable information about within-person dynamics that could be useful for clinical settings, as well as for generating testable hypotheses to be used in the development of theory and future research.

For example, consider participant 102, who did not fit our hypothesized mediation structure. For this individual, dampening led to more worry at the next observation; worry led to less PA 4 hours later (lag-1) and more dampening 8 hours later (lag-2). Worry was actually a lagged mediator of the relationships between dampening and PA. Put another way, in some people, worry may be a mechanism through which dampening can lead to decreases in PA. It is somewhat intuitive that endorsing items like *when feeling happy, I think about what can go wrong* could spur or foment worry-related cognitions, which then function to reduce PA contemporaneously. This person also showed a positive feedback cycle between worry and dampening (dampening predicts increases in worry 4 hours later, and worry in turn predicts increases in dampening 8 hours later). Perhaps for some, like participant 102, dampening and worry work in tandem to serve a contrast-avoidance role. Data and idiographic models for all participants are available in Open Science Framework:

https://osf.io/4x8jd/?view_only=33843cf6d12840d485fba6aa28b17c54.

It is also possible that for some, “dampening” occurs outside of conscious awareness. Perhaps blunted PA results from “bottom-up” processes such as diminished neural activation in response to rewarding or reinforcing stimuli (cf. Haber & Knutson, 2010). In the present study, we defined dampening as an intentional suppression of PA via particular cognitive strategies (e.g., thinking about what could go wrong), therefore, we are unable to detect potential “bottom-up” processes. The existence of such processes could be idiosyncratic, contributing to the inter-individual variance in the relationships we observed between worry, dampening, and PA.

The Importance of Temporal Scale

A key limitation is that we sampled these processes only four times daily. The limitation of sampling frequency is a problem across much of the EMA literature, but this is a *particularly* problematic limitation when the constructs of interest (e.g., emotions) likely change faster than the available sampling frequency. Further, perhaps there are dynamic relationships between these constructs that play out on the order of seconds or minutes, rather than hours.

This would explain why worry and PA were negatively contemporaneously correlated in 87 of 96 participants. It is possible that the proposed mediation relationship occurs too quickly to be captured with measurements every four hours; worry in one moment could predict dampening of PA seconds or minutes later, which in turn could lead to rapid changes in PA. Consistent with this possibility, one recent study showed dampening of PA is related to attentional bias away from positive emotional faces when presented for three seconds or longer, suggesting dampening might be able to exert effects on PA (or attention to PA) somewhat quickly (Peckham, Johnson, & Gotlib, 2016).

Implications and Future Directions

Future studies should continue to investigate emotional processes in GAD, with an eye toward understanding processes such as contrast-avoidance or dampening that could lead to diminished PA. Individuals with GAD have problems with emotion regulation *generally*, and while this is often considered in the context of NA, there is mounting evidence for specific problems concerning PA as well. GAD may be associated with experiencing less PA (Bosley, Fernandez, & Fisher, under review) and dampening or avoiding in response to PA (Eisner et al., 2009). Clinically, this is problematic because PA is associated with broader, more flexible cognitive processes (Fredrickson, 2001), which represent key areas of impairment in GAD. Further, even with a course of gold-standard evidence-based behavioral GAD treatment, there is evidence PA does not improve for many individuals, even among those who show significant improvements in GAD symptoms and NA (Bosley, Fisher, & Taylor, 2018; Kring, Persons, & Thomas, 2007). Thus, continued research on emotion and regulatory processes in GAD may pave the way to better treatment outcomes for a population that badly needs improvements in intervention (Hofmann & Smits, 2008).

The present study highlights potential barriers to research on emotion regulation in GAD. Namely, we found the nature of lagged relationships between emotion and regulatory behavior to be highly idiosyncratic. Further, it seems likely that relationships among constructs of interest in the present study occur on a time scale too rapid to be detected at a four-hour time lag – and, perhaps the optimal EMA sampling frequency is itself idiosyncratic. However, these barriers are not insurmountable. An idiographic approach to data analysis is one crucial way to mitigate these barriers, allowing researchers to model individual differences as signal, rather than noise. Findings from the present study suggests an idiographic approach might be particularly well-suited for research questions about emotion regulation in daily life.

Given individual differences in the experience and regulate of emotion (John & Gross, 2007), perhaps certain hypotheses about time-varying paths from emotion regulation to emotion, would *not* be expected to hold at the group-aggregated level and instead should be tested idiographically. As the present study exemplifies, with such an approach, the goal should not be to come up with some nomothetic “truth” that holds for the entire group. Instead, the goal should be to utilize a systematic process for uncovering person-specific time-varying dynamics that accurately represent the experiences of individuals. Results from person-specific modeling could be aggregated at the group level to understand the prevalence or predictors of certain time-varying patterns in emotion and regulation. By modeling individuals idiographically, researchers can begin to understand the nuances of individual variation in emotion regulation and its effect on emotion, beginning to address the crucial questions of “what works when” and “for whom”.

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Table 1: Summary statistics for within-person contemporaneous correlations of study variables.

Variables	Worry and Dampening	Dampening and PA	Worry and PA
Range	-0.34 to 0.91	-0.88 to 0.63	-0.88 to 0.61
Mean*	0.26	-0.14	-0.33
Median	0.25	-0.15	-0.36
SD	0.28	0.30	0.28

*First, within-person correlations between each of the study variables were computed. Here, the mean represents the nomothetic average of the within-person correlations for each pair of variables.

Table 2: Completely standardized solution values for nomothetic lag-2 mediation model.

Constructs	Beta value
Worry ($t - 2$) predicting Dampening ($t - 1$)	0.03
Dampening ($t - 1$) predicting PA (t)	0.07
PA ($t - 2$) predicting Dampening ($t - 1$)	-0.03
Dampening ($t - 1$) predicting Worry (t)	-0.03

Table 3: Frequencies and directions of significant cross-lagged paths across exploratory idiographic models (n = 96).

	Worry → Dampen	Worry → PA	Dampen → PA	Dampen → Worry	PA → Worry	PA → Dampen
Frequency of Path	5	7	6	14	11	9
positive	4	5	1	11	3	4
negative	1	2	5	3	8	5

Figure 1: Hypothesized lag-2 mediation model.

Figure 2: Distributions of within-person contemporaneous correlations of study variables.