

ORIGINAL ARTICLE

Using idiographic models to distinguish personality and psychopathology

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Abstract

Objective: While the overlap between personality and psychopathology is well documented, few studies examine how the two overlap at a lower, moment-to-moment level. We took an idiographic approach to examine personality and psychopathology processes at the individual level. Doing so offers a unique perspective by incorporating both dynamic time and structural analysis, two components that are traditionally examined separately when investigating the overlap between personality and psychopathology.

Method: Two experience sample studies measured personality states and personality problems up to four-times a day over a two-week period (Study 1 $N = 349$, observations = 11,124; Study 2 $N = 161$, observations = 8,261).

Results: For some, personality states and personality problems are deeply intertwined, mirroring existing between-person findings. But for others the two are separate, indicating it is possible to separate personality (states) from a person's problems. Between-person differences in levels of depression had no association with the idiographic structure, indicating that between-person constructs operate separately from within-person processes. Finally, situations that are more likely to bring out personality problems did not alter the association between personality states and personality problems.

Conclusions: This method provides a novel conceptualization of personality–psychopathology overlap, bringing the focus beyond mostly static, between-person models to more dynamic, individual-level models.

KEYWORDS

GIMME, idiographic, personality pathology, personality problems, personality structure

1 | INTRODUCTION

A large body of evidence finds substantive overlap between psychopathology and more normal range personality measures. Personality traits are consistently associated with psychopathology in later childhood and adulthood, as meta-analyses have linked traits with various psychiatric and personality disorders (Kotov et al., 2010; Saulsman & Page, 2004). Based on the overlap, normal range personality traits are even included in modern taxonomies of psychopathology

(e.g., HiTOP model; Kotov et al., 2017; Widiger et al., 2019), signifying the importance of the overlap. However, despite the acknowledgment of overlap between personality and psychopathology, the nature of this relationship remains elusive, with many potential reasons why the two are related (Clark & Watson, 2008; Tackett, 2006).

Theories for describing how personality and psychopathology overlap can be divided into two forms. The first, *etiological*, describe the potential for personality to influence the time course of psychopathology through mechanisms

such as scarring, pathoplasty, and vulnerability (e.g., Gilbert et al., 2019). The second, *measurement*, posits that the two either (a) share a spectrum relationship (i.e., personality and psychopathology occupy different levels of the same latent trait; e.g., Samuel et al., 2010) or (b) demonstrate equifinality (i.e., indicators that have the same manifestation but do not share the same cause) in part through the choices made when developing assessments. Importantly, the standard etiological perspective assumes that personality and psychopathology are two distinct constructs, joined together via time, whereas the standard measurement perspective assumes that the latent construct under investigation is shared amongst people, without considering the time course over which it unfolds.

In the current paper, we combine these two perspectives and jointly examine both the time course over which dynamics unfold and the structure of personality and psychopathology assessments to shed new light on the overlap between the two. In doing so we introduce a third perspective, idiographic, to describe a potential relationship between personality and psychopathology. The ideas presented are not novel as idiographic perspectives have a rich history within both clinical and personality psychology (Beck & Jackson, 2020a; Cervone, 2005; Rosenzweig, 1958; Wright & Woods, 2020). However, there is a paucity of empirical work tying normal range personality with psychopathology at the idiographic level. The current work provides a proof of concept and preliminary evidence for how personality and psychopathology can be conceptualized jointly within this framework.

1.1 | Down the personality trait space hierarchy

The key step in addressing whether the person is different from their problems is defining the measurement of the person, and the measurement of their problems. The vast majority of the work on the investigation of the overlap between personality and psychopathology has been at the broadest level of the construct hierarchy. For normal range personality, the broad level is typically at the Big Five or Three, whereas for psychopathology this level is often defined as broad constructs like externalizing/internalizing or maladaptive traits within the Alternative Model of Personality Disorders (AMPD) set forth in DSM-5. Regardless of the specific conceptualization, at this high level of aggregation there are large amounts of covariation between personality and indices of psychopathology (Gore & Widiger, 2013; Kotov et al., 2010).

These associations should not be (that) surprising given that the two describe the content of the behavioral spectrum, with normal personality representing more adaptive behavioral responses and psychopathology more dysfunctional responses. But beyond the unsurprisingness of overlap between

personality and psychology, their integration is beneficial. Omitting normal range behavioral responses from a grand model of functioning would be akin to a form of selection bias. In epidemiological studies where only the healthiest can be included in clinical trials there is a “healthy user bias” such that people who are a part of the study are healthier than average and thus not representative of the population. Similarly, only focusing on the extreme end of dysfunction leads to an “unhealthy user bias” where only focusing on personality problems within samples leads to a stratification of functioning that omits the protective benefits of normal range behaviors. Thus, only studying the more maladaptive aspects of functioning could lead to improper conclusions about how maladaptive behaviors arise. Further, joining these two fields together allows each to draw upon decades of data from normal range functioning. Recognizing that the content of basic and maladaptive personality traits align prompts the inclusions of normal range constructs within broad clinical syndromes such as the HiTOP system (Conway et al., 2019; Widiger et al., 2019).

Despite the promise of joining personality and psychopathology perspectives together on a functioning spectrum, there is not a one-to-one correspondence between the two, particularly when trying to coax two disparate and historically separate literatures to meet in the middle. First, not all of the content of the Big Five exist in the newer models of psychopathology, with, for example, openness often being excluded (Chmielewski et al., 2014). Second, there tends to be more overlap with Neuroticism, as opposed to the other traits (Widiger & Costa, 1994). Third, there is poor specificity when it comes to specific diagnoses, with normal range traits being similarly associated to many forms of psychopathology, rather than distinguishing among them (Kotov et al., 2010). Fourth, when looking at specific traits, psychopathology does not necessarily exist at the extreme end of the latent trait nor personality at the low end (Samuel et al., 2010; Suzuki et al., 2015).

The challenges of integrating personality and problems are similarly extreme at lower levels in the personality psychopathology trait space hierarchy by looking at personality facets (Samuel & Widiger, 2008). For example, Extraversion facets show differential associations with different forms of psychopathology (Watson et al., 2015). Similarly, when looking at a single pathology, such as OCPD, certain Conscientiousness facets are strongly related with OCPD while others are not (Mike et al., 2018). But facets, like broad traits, are assumed to be relatively consistent across time and context, which misses the time course over which personality and problems unfold.

Below facets are personality manifestations in the forms of thoughts, feelings, and behaviors. Manifestations are variable, demonstrating patterns of ebbs and flow. It is important to distinguish the higher order relatively consistent

traits and facets with these more dynamic manifestations. For simplicity, four different conceptualizations of personality and psychopathology can be discussed. Relatively consistent trait measures of (a) personality (along with their facets) and (b) psychopathology—where most of the research has been focused—and the behavioral manifestations of personality traits, which we will call (c) personality states, and manifestations of psychopathology, which we will call (d) personality problems. The latter two provide a more dynamic and situation-specific vantage point of these constructs. The former two is the level that personality–psychopathology overlap is typically discussed.

Personality states differ in content from personality problems in that personality manifestations include adaptive functioning whereas personality problems include expressions of dysfunction. The demarcation of these two, however, is difficult in practice. When viewing the content of personality trait measures and measures of psychopathology, the two often have many overlapping features, bordering on equivalent indicators. Further, measures of personality traits are sometimes reconfigured to provide measures of personality pathology (e.g., Reynolds & Clark, 2001). The distinction between personality states and problems is equally difficult, especially given that many manifestations of normal range personality states can be considered problematic if they occur frequently, persist in duration, oscillate rapidly, or occur in response to specific triggers (Moskowitz & Zuroff, 2004).

Despite the difficulty in operationalizing personality states and problems, it is important to note that the two can be separated. When viewed at the level of the individual, personality is neither sufficient nor necessary to manifest personality problems. While personality traits are what is consistent in a person's life, personality states and personality problems can more easily manifest due to outside sources. As a result, personality traits, personality states, and personality problems may not align with one another (Hopwood, 2018). For example, someone with the same personality traits as President Trump may not have the same personality problems as he does, given his current role. A person's general life context, such as being in a stressful and hostile work environment, could either increase or decrease the impact of personality traits on how problems manifest. As a consequence, it is possible that personality states and personality problems may not show the same associations as the broader constructs of personality traits and psychopathology.

Few studies have looked at personality states simultaneously with personality problems. Most investigations examine personality problems with personality traits rather than personality states. This practice is largely pragmatic, in that, personality traits are useful for clinical practice, assisting to ground the clinician in a person's typical actions (Hopwood, 2018). This view is closely related to pathoplastic views of personality–psychopathology overlap, in so much

as personality traits may impact the dynamics and expression of psychopathology (i.e., personality problems). Personality states, which tap adaptive functioning, are not the focal point of therapy and thus are thought to offer limited clinical utility. One potential exception to this is Cybernetic Theory of Psychopathology (DeYoung & Kruger, 2018), which uses states as a way to discuss and embed Big Five personality traits within a functionalist model. In such a way, states are useful merely as indicators of the trait, not as their own entity. Other work has examined more adaptive markers of personality states along with personality problems, yet this work is only starting to accumulate (e.g., Wright & Kaurin, 2020). As it stands it is unclear how personality states relate to personality problems. While personality and psychopathology are associated at the trait level, it is unclear how strongly they co-occur at the state level. More importantly, it is unclear (a) how they relate to one another across time and (b) whether environments, like stressful ones, impact the association.

1.2 | Personalized psychopathology and personality problems

At the lowest-level of the personality hierarchy, there is an infinite array of personality manifestations. On one hand, the multiplicity in how people manifest their selfhood is what defines their individuality. On the other hand, this diversity in the way that people express their personhood—not to mention the diversity in the paths that lead to these manifestations—has long complicated discussion about how best to measure and describe people, seeming somewhat futile in its complexity. This prompts the question of what model and analytic framework is necessary for incorporating lower level manifestations of personality problems? Nearly a century ago, Allport (1937) discussed a taxonomy of what is common to all people (i.e., nomothetic) versus what is unique to a specific person (i.e., idiographic). Common attributes may be appropriate to discuss broad, group-level commonalities. But to understand the causes and processes of what leads to different outcomes, one must take a personalized idiographic approach.

This idiographic perspective calls into question the utility of current taxonomies of psychopathology, as they are based, largely, on nomothetic evidence. Taking depression as an example, symptoms such as lethargy and sleeplessness might be present in one individual but totally absent in another. To understand the processes that lead to depression one needs to understand the person first and foremost. While diagnostic categories have long been discussed as too heterogeneous and co-occurring too be useful (Krueger & Markon, 2014), recent proposed solutions such as RDoC and HITOP that break categories down into narrower syndromes are also limited in that they still assume a common, nomothetic structure

among people. Assumptions such as these could prove problematic. While the nomothetic structure of psychopathology may be thought of as being built upon—or emerging from—individual or idiographic structures that do not mean we can backwards translate a nomothetic structure to an individual. Just as any one person can differ from group averages, any one person's structure may look different from the group structure (see Molenaar, 2004). If a person's psychological structure differs from the “average,” then it is necessary to get to know the individual to understand them and to ultimately treat their problems. This simple idea that to understand a person's pathology, one needs to get to know the unique factors that make a person tick, suggests that clinical practice is primarily an idiographic enterprise (Piccirillo et al., 2019; Wright & Woods, 2020).

Further complicating issues is that the “average” may not reflect the average of individuals. Mathematically, the between-person nomothetic structure is not necessarily related to the within-person idiographic structure (Borsboom et al., 2003; Molenaar, 2004). Similar to how Simpson's paradox indicates that averaging over lower level units of analysis can provide erroneous higher-level results, it is possible that idiographic processes may not be reflective at the nomothetic level. Said differently, even if HiTOP is the true between person structure of psychopathology, it may not necessarily be the structure for any single person, thus possibly eliminating useful causal or ontological information necessary for understanding psychological processes or translating research into clinical practice.

Idiographic work within psychopathology has blossomed in the past decade (For a review see Wright & Woods, 2020). These studies find that people have different associations between personality problems, and importantly that the dynamics play out across such that there are interindividual differences in intraindividual dynamic features. Some people are more variable than others, some people have higher auto-regressive effects for some variables than others, and some have different variables that are more relevant for them compared with others. These findings strongly suggest that understanding personality problems necessitates taking an idiographic point of view.

1.3 | Idiographic personality models

Idiographic models of personality originate from the same historical sources as psychopathology (for a review see Beck & Jackson, 2021). Despite nearly a century of discussion, and progress within the psychopathological side, few studies of idiographic personality exist. Two main reasons have held back progress. First, until recently, the data necessary to estimate idiographic models have remained hard to come by as time series data are cumbersome to collect. A number

of personality and psychopathology researchers have examined how personality and psychopathology manifest over time (e.g., Hisler et al., 2020) as well as how situations may trigger such manifestations (e.g., Breil et al., 2019) within-person. Standard within-person analyses assume some sort of commonalities in the indicators and their association across people. But almost none have addressed these questions idiographically.

The second reason for the lack of idiographic methods is *not* that idiographic ideas were discarded and not considered this past century, but rather because of an abundance of idiographic theory. The social cognitive perspective that was birthed from the person-situation debate is ostensibly an idiographic enterprise (e.g., Cervone, 2005; Mischel & Shoda, 1995). Yet, progress has not been empirically fertile, mostly due to the infinite variability implied by the idiographic perspective. In other words, the personality space is seemingly too big to be tractable idiographically: Everyone has (a) unique constructs, (b) different associations between constructs, (c) differences in relevant constructs cross time and situations both with and across people, and (d) differences in the importance of situations within and across people. Whereas in defining the idiographic space in psychopathology one can focus on existing symptom or clinical criteria, the potential of normal range functioning personality trait space is nearly infinite. If there is an infinite number of ways to be, there is an approaching infinite number of explanations for behavior, and thus an approaching zero number of generalizable inferences one can make about personality.

It is an open question of what the trait space for a cumulative science of idiographic personality should look like (Beck & Jackson, 2020b). The most straightforward approach is to use the reigning model of personality, the Big Five/FFM, as a starting point for what individual differences are important. When doing so, there is a mismatch between the structure of personality within-person and between-person using *P*-technique factor analysis (Beck & Jackson, 2020a, 2020b; Borkenau & Ostendorf, 1998; Molenaar, 2004). Even among those individuals who showed the same number of factors, there was heterogeneity in the content. Further, when using an idiographic model that explicitly incorporates time, people differed in the lags between constructs across time and how strongly constructs were associated within themselves (Beck & Jackson, 2020b). Thus, even with a smaller trait space, people appear to have idiographic structures of personality different from the between-person structures.

Importantly, these idiographic models are neither ships passing at night nor just a short-lived descriptive of personality function for a short slice of time. Instead, there is sizable two-year consistency estimates for some idiographic aspects of personality (Beck & Jackson, 2020a, 2020b). The association between constructs at a single time point (i.e., contemporaneous associations) are related across time such that for

people who were hardworking when happy they tended to be hard working when happy two years later. At least with a constrained trait space, the idiographic models are getting at an individual difference that is potentially lasting.

1.4 | Current study

The current study offers a novel examination of personality and psychopathology via investigating how personality problems and personality states are related idiographically, using two experience sample studies. Three questions are addressed.

1. *Are personality states and personality problems separate within people? Or do they tend to co-occur?* Much of the identified overlap of personality and psychopathology occur on average when collapsed across people, but this association may not occur within everyone.
2. *Do personality states and personality problems differ depending on levels of psychopathology?* It is possible that for people with low levels of psychopathology personality problems do not occur frequently enough to demonstrate an association with personality states. Those that are experiencing some increased level of psychopathology, such as depression, may thus be more likely to demonstrate associations with personality states. To investigate we will examine how nomothetic levels of depression impact the idiographic models.
3. *Do situations increase or decrease the observed associations between personality states and personality problems?* The association between personality states and personality problems may not co-occur regularly. An idiographic system could yield lower associations between personality states and personality problems if the contexts are not aligned for example a situation prompts a maladaptive response like anxiety but does not call for an adaptive response.

2 | METHOD

2.1 | Participants and procedure

Two samples of undergraduate students at a Midwest private university completed experience sampling method (ESM) surveys across for two weeks multiple times a day. The first sample was comprised of 417 (136 males, 279 females) students with a mean age of 19.44 ($SD = 2.33$). Participants were paid \$20 for the laboratory portion of each assessment and entered into a lottery with the chance to win \$100 for completing ESM surveys (if all ESM surveys were completed, the odds of winning were 1 in 10). Participants'

self-reported ethnicities indicated that 56% identified as White or European-American, 23% as Asian, 9% as Black, and 12% as other. About 2% of participants did not report their ethnicities. Previously, the study authors have analyzed some of the personality ESM items from this dataset (see Beck & Jackson, 2020a). Participants first completed 2-hr of questionnaires, interviews, and tasks. After completing the laboratory portion, the researchers provided participants with instructions on the ESM component of the study. Participants received four emails per day with links to the ESM survey for two weeks. Including a practice survey, there were 59 possible surveys for each participant.

Participants completed a total of 15,563 ESM surveys in Study 1. ESM surveys were excluded if (a) a survey was completed more than 3 hr after it was sent out, (b) the participant was sleeping during the target measurement point, (c) the participant completed less than 75% of the survey items, and (d) the participant provided the same response for 70% or more of the items. This resulted in a sample of 11,540 surveys. In addition, participants who completed fewer than 10 ESM surveys were excluded, yielding final N of 349 participants (106 males, 241 females; $N_{assessments} = 11,124$). The median number of completed surveys were 41 (range 11 to 54).

The second sample consists of 199 (60 male, 154 female) students with a mean age of 19.98 ($SD = 1.32$). Participants were paid \$10 for the laboratory portion of the study and \$0.50 for each experience sampling survey completed. Participants' self-reported ethnicities indicated that 60 identified as White or European-American, 50 as Asian, 25 as Black, and 28 as other (with the remaining participants declining disclosing their race or ethnicity). The study authors have not published from this dataset. Participants completed pre-ESM questionnaires in the lab and were instructed on how to complete the ESM assessments. Participants received four per day for two weeks. There were 56 possible surveys for each participant. No studies have been published using this dataset.

Participants completed a total of 8,672 ESM surveys in Study 2. Participants who completed fewer than 20 ESM surveys were excluded, yielding final N of 161 participants (39 males, 122 females; $N_{assessments} = 8,261$). The median number of completed surveys were 47 (range 20–56).

2.2 | Measures

2.2.1 | Personality states

In study 1 participants responded to questions about their situation, emotions, and behavior in the last hour. Personality items were a subset of eight items taken from the BFI-44 (John et al., 1991), but were modified to reflect the collection periods of the ESM survey (e.g., "From 5–6 p.m., how

engaged were you?"). Participants responded on a five-point scale from 1 "Not a lot" to 5 "Very." With the exception of Agreeableness items (2), which were only collected if the participant indicated they were interacting with someone in the previous hour, participants responded to all items at each measurement point. In addition, items from the Openness to Experience domain were not included.

In study 2, personality states were assessed using the full, 60 item BFI-2 (Soto & John, 2017). The scale was administered using a planned missing data design. We have previously demonstrated both the between- and within-person construct validity of assessing personality using planned missing designs using the BFI-2 (<https://osf.io/pj9sy/>). The planned missingness was done within each Big Five trait separately, with three items from each trait included at each timepoint (75% missingness). Each item was answered relative to what a participant was just doing on a five-point Likert-like scale from 1 "disagree strongly" to 5 "agree strongly." The order of the resulting 15 items was then randomized before being displayed to participants.

2.2.2 | Personality problems

In study 1, problems were measured using five items (rude, depressed, worried, negative emotion, and (low) self-esteem). Self-esteem will be reverse-coded such that higher levels of on them will indicate lower self-esteem. Participants responded on a five-point scale from 1 "Not a lot" to 5 "Very."

In study 2, problems were assessed using four items (anxious, depressed, emotionally volatile, and angry). Participants responded to each on a five-point Likert-like scale from 1 "disagree strongly" to 5 "agree strongly."

2.2.3 | Depression

In study 1, trait depression was measured using the Center for Epidemiological Studies-Depression scale Revised, 10 item (CES-D-R-10; Miller et al., 2008), which is a ten-item scale indexing the number of days in the last week that participants have experienced several symptoms of depression (e.g., loss of sleep, loneliness). Participants responded to each item on a four-point Likert-like scale from 0 "Rarely or none of the time" to 3 "Most or all of the time."

In study 2, trait depression was measured using the Center for Epidemiological Studies-Depression scale (CES-D; Radloff, 1977), which is a 20-item scale indexing the number of days in the last week that participants have experienced several symptoms of depression (e.g., loss of sleep, loneliness). Participants responded to each item on a four-point Likert-like scale from 0 "Rarely or none of the time" to 3 "Most or all of the time."

2.2.4 | Situations

In study 2, we also included two indicators of situations, one academic (anxious about schoolwork) and one interpersonal (a composite of arguing with a friend or a family member). All were responded to a binary scale where 0 indicated "not true" and 1 indicated "true."

2.3 | Analyses

The analyses in the present study will proceed in several steps. Code scripts, expanded results, and data are available through the projects OSF page: <https://osf.io/v7qtu/>. Analyses were not preregistered.

First, state personality and problems and trait depression were cleaned and reversed scored. In study 2, because of the planned missing nature of the personality states, we first reverse scored and composited personality data within the 15 BFI-2 facets for each person in each wave at each measured time point. Because previous work indicates that these imputed data show good between-person structure and strong convergence with both raw data and trait data (<https://osf.io/pj9sy/>), these data were multiply imputed using the Amelia (Honaker et al., 2011) package in R. Empty rows were added to the ESM data to account for missing surveys.

Second, we estimated idiographic personality structure using the GIMME procedure, which is a procedure for estimating both group-level and idiographic relationships in time series data. As currently implemented in the *gimme* package (version 0.7-4; Lane et al., 2016) in R, the procedure estimates a series of unified structural equation models (uSEM) for each person and constructs a set of group-level pathways based on the individual-level models. uSEM uses an iterative procedure for retaining pathways in the model using Lagrange multiplier tests. The GIMME procedure begins by estimating the pathways to be retained at the group-level (i.e., in all individual-level models) by estimating individual-level models and retaining group-level pathways for those paths were shared by 75% of participants. To establish these group-level pathways, starting with a null model, pathways are iteratively added to all individual models. The path that improves the fit according to the Lagrange multiplier tests for the largest proportion of individuals (above a chosen threshold, 75% by default) is retained as part of the group-level structure (i.e., in all participants' final unique models). This procedure is continued until no additional pathways improve fit for a proportion of people above the threshold. Idiographic models are then built using a similar procedure, with the exception that pathway inclusion is not based on the proportion of individuals who show model fit improvement by adding a path. Instead, pathways are retained according to the Lagrange multiplier test based on the target individual

(rather than the set of individual Lagrange multiplier tests) and begins with all paths retained at the group-level structure as the null model, which are freely estimated for each individual. The iterative procedure continues for each person until the procedure indicates that no pathways improve model fit.

The GIMME procedure resulted in an asymmetric, rectangular matrix of associations for each participant, where rows are outcome variables and columns are predictor variables. The number of rows is equal to the number of indicators, while the number of columns is equal to $2 \times$ the number of indicators because lagged predictors are also included in the model. We will investigate the results as contemporaneous (within-time), lagged (across-time; all associations between current and previous time point indicators).¹ In the simplest case, contemporaneous associations test whether observed levels of one indicator at time t track with the levels of another indicator measured at the same time point t , while lagged associations test whether levels of one indicator at time t track with previous time point ($t - 1$) levels of the same or another indicator.

To address question 1, we examined the frequency with which personality and problems relate to one another across people by looking at edge-, node-, and network/model-level patterns. For edge-level properties, we examined the frequencies that different edges occur across people, both within and across personality and problems. Next, we will calculate the strength and number of the associations (i.e., strength and degree centrality) for each personality and problem indicator. Because we care about the degree to which a personality indicator is associated with personality versus problem indicators, we calculated these separately for each indicator, separating the estimates based on whether the variable type of a focal indicator (personality, problems) matches the variable type of the other indicators it is associated with. Because we have more personality than problem indicators, these values were normalized to account for advantages due to the number of indicators within each category. Finally, at the network level, we calculated the average strength and degree centrality for each person for both matched (i.e., personality–personality) and unmatched (personality–problems or problems–personality) associations.

Then, to address question 2, we will bring in depression scores, splitting the sample in each study as to whether they meet clinical cutoffs on the CES-D scales. Then, we will repeat the descriptive procedure from question 1, testing whether the edge-, node-, and network-level matched and unmatched personality and problem associations differ as a function of depression. If personality and problems can be distinguished by depression, we should see differences in these groups. To test this inferentially, we will run a series of simple regressions predicting edge-, node-, and network-level properties from depression groups using the *brms* package in R (version 2.13.5; Bürkner, 2017).

Finally, to address question 3, we will use only study 2 to examine how situations impact personality–problem relationships across groups. The GIMME procedure was done twice more, once including the anxiety about situations indicator and once including the argument indicator. Then the procedure from questions 1 and 2 will be repeated to test how including situations influences the patterns.

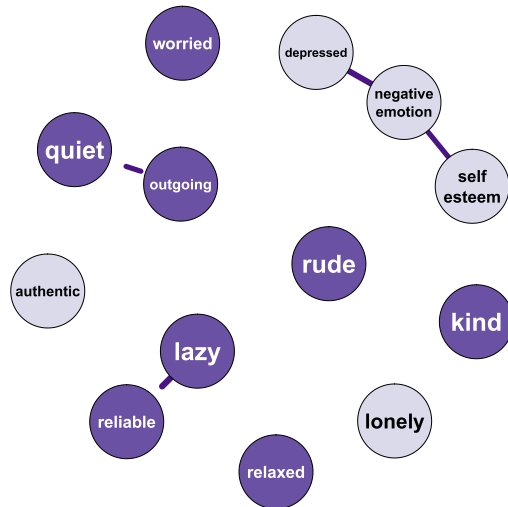
3 | RESULTS

3.1 | Do personality states and personality problems co-occur within people?

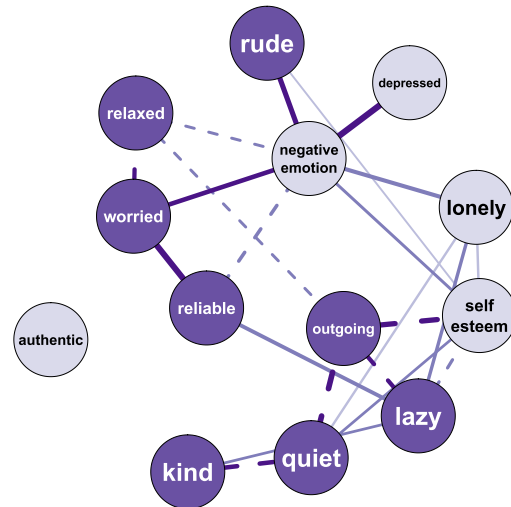
In each participant in each study, we fitted a series of idiographic models to investigate how personality states and personality problems are associated within people. Which pathways were present in the individual models were almost wholly unique, as the GIMME procedure indicated that only lagged associations of a variable with itself (i.e., self-loops) and no contemporaneous pathways should be retained and freely estimated in each of the individual-level models. To orientate the reader to these analyses and potential idiographic structures, four example participants are presented in network form in Figure 1. All remaining participants idiographic structures can be viewed in the online materials. Associations between items (nodes) can be interpreted as multiple regression coefficients (i.e., controlling for all other pathways) and are referred to as edge weights. Solid lines indicate a positive association, whereas dashed lines indicate a negative association. Missing edges indicate that the association was empirically constrained to 0. To examine which indicators were more predictive of participants' momentary experience, we further examine two measures of centrality: strength and degree. Strength centrality is calculated as the sum of the absolute value of all edge weights of a focal node, while degree centrality is calculated by counting the number of edge weights of a focal node, which we normalized by the number of indicators to aid interpretation.² Previous investigations have linked strength centrality in such models to eigenvalues, which are an indicator of how much variance a variable explains. These are contemporaneous (same time) associations only. Lagged association results are available in the online materials.

There was a great amount of heterogeneity in personality structure across participants. The top row includes two participants from Study 1. In the top left panel, personality states tend to covary with personality states, while personality problems tend to covary with personality problems, with fewer connections across the state–problem divide. For example, acting kind is associated with not being quiet or relaxed—all personality states. For this person, kindness is not related to any personality problems. Similarly, feeling

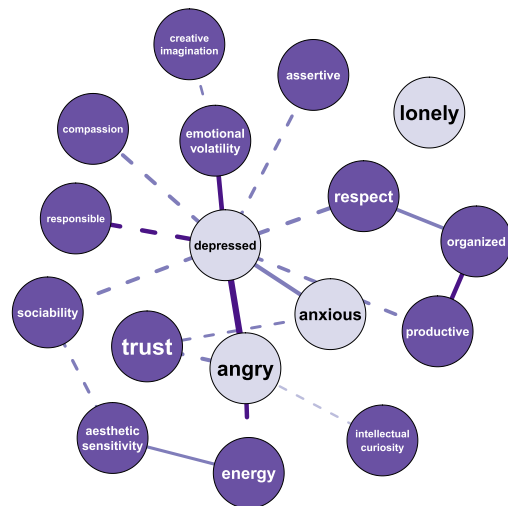
PAIRS: Contemporaneous for S13236, none



PAIRS: Contemporaneous for S17656, none



IPCS: Contemporaneous for S159, none



IPCS: Contemporaneous for S221, none

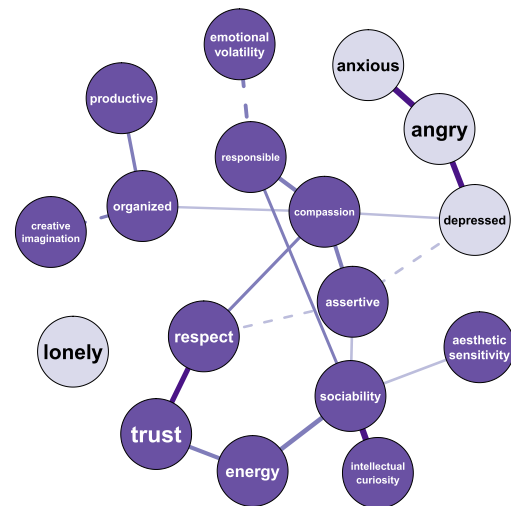


FIGURE 1 Example idiographic personality structure for participants from Study 1 (top row) and study 2 (bottom row). Lighter shading represents personality problems while darker shading indicates personality states

low in self-esteem was positively associated with feeling more worried, more depressed, and higher negative emotion levels. Self-esteem for this person was associated with other personality problems but not personality more normal range manifestations of personality states. By contrast, the top right panel finds a person whose problems are more intertwined with personality states. When this person is feeling more depressed, they are also rude, lazy, worried, kind, and less outgoing. Here, personality problems are associated with other personality problems and personality states. For the person in the left panel, personality states and problems appear to be mostly distinct from one another whereas for the person in right panel personality states and personality problems appear inseparable.

Study 2 also showed similar heterogeneity in personality state-problem associations, as seen in the two bottom panels.

The bottom left panel demonstrates a participant whose personality and problems were largely separate, with the exception that the participant tended to feel more anxious when they also reported feeling more trust. This idiographic structure would suggest that personality states and problems are not experienced simultaneously for this person, signifying that this person is able to compartmentalize their problems from their personality. By contrast, problems are closely linked with personality states in the bottom right panel. Indeed, each personality problem was linked to at least one personality state, while there were few associations among the problem states themselves. This participant's emotional volatility appears to be central to their functioning, as it covaries with feeling more depressed, compassionate, and sociable and less assertive, trusting, organized, curious, angry, and sensitive to aesthetics.

These four plots could each lead to different observations about the overlap of personality and psychopathology. For some, personality problems appear to be mostly separate from personality. For others, personality states and problems are intertwined and inseparable, identifying associations consistent with the literature. To examine these associations more rigorously for the entire sample, we used two ways to examine the prevalence of personality states and personality problems co-occurring idiographically.

First, we examined the frequency of covariance between personality problems and personality states within-person. These analyses address how many people, when feeling depressed, for example, are also likely to be quiet. Figure 2 presents these contemporaneous associations between states and problems (see online materials at <https://osf.io/v7qtu/> for lagged associations). The key component to inspect is the rectangular area at the top right showing the number of identified edges between states. Larger circles denote a greater number of associations, whereas small circles signify a small number (exact values are available as tables in the online materials). The number of connections can be compared with the frequency of associations for personality-states with personality states, and personality problems with personality problems (top left and bottom right triangles, respectively). If personality and problems are separable, then we should find much larger circles for personality state–personality state associations and problem–problem associations than for personality–problem associations. However, this is not the case. What is apparent is that the number of edges between personality

states and problems (non-matched) are roughly equivalent to the matched associations (e.g., personality states with personality states). That is, personality problems are often associated with personality states, at a level that is not greatly different than personality states and problems co-occurring with themselves. These findings indicate that personality states tend to co-occur with personality problems, on average.

Despite this convergence, on average, two points are worth noting. First, personality problems were not well differentiated by personality states as there was not a pattern that distinguished between different problems. That is, there tends to be similar associations with personality states across all problems. Second, the overall percentage of overlap was relatively modest, with the majority of participants not showing any single association. This lower percentage of overlap highlights the heterogeneity in within-person associations.

We next looked at how states and problems related to one another by looking at centrality metrics. As indicated previously, centrality refers to the relative importance of an indicator (node) as it relates to the structure of the network. For the following analyses, we specifically looked at node centrality split according to whether connections were matched (personality with personality, problems with problems) or not (personality with problems and vice versa). This examines the extent to which (a) personality states were related to other personality states, (b) personality problems were related to personality problems, and (c) personality states were related to personality problems. Whereas our first set of analyses only looked at frequencies of the existence of an association,

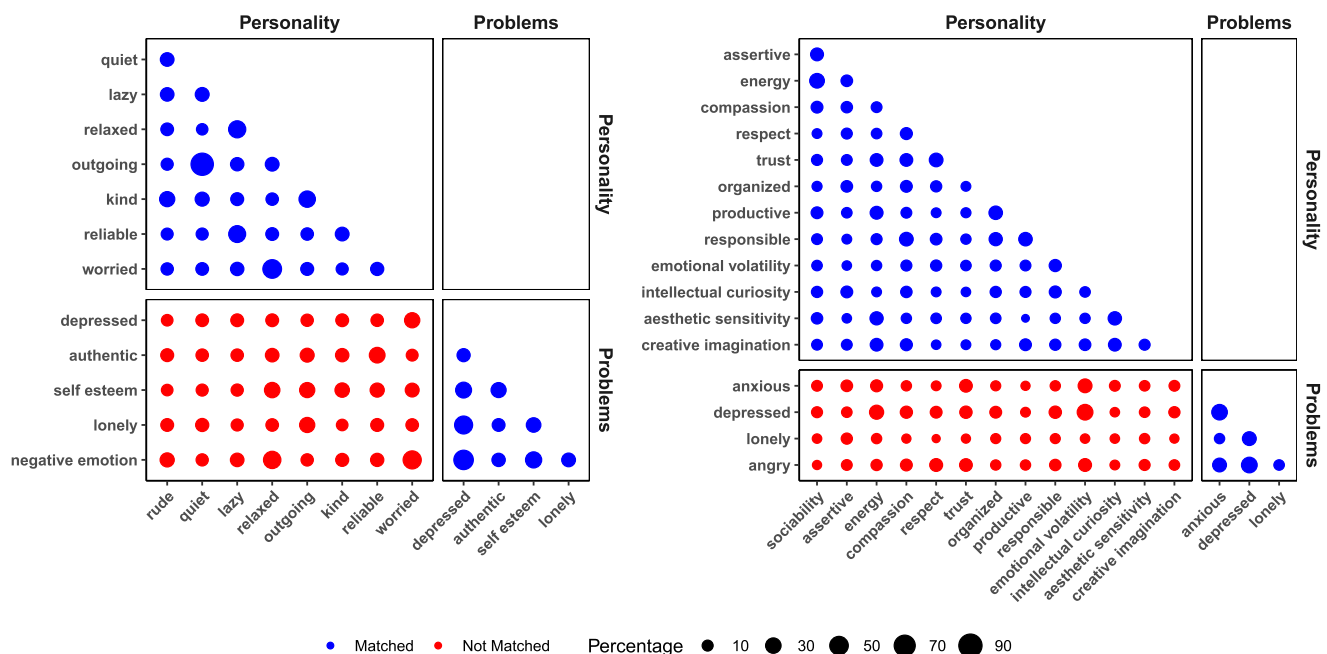


FIGURE 2 Size of circles represent the percentages of edges present in each of the samples idiographic personality structures (Study 1 left, Study 2 right). Larger circles indicate that more people had associations between personality manifestations, while smaller circles indicate a greater percentage of individuals had those edges constrained to zero

these analyses examine both the frequency and the strength of associations. To do so, we z -scored centrality indicators for each participant in each study according to whether associations were matched or not to be able to composite associations across participants and to better compare relative differences across indicators in standard deviation terms. Lagged results are included in the online materials.

Figure 3 shows the estimates for both studies. In study 1, there were mixed results depending on the specific association being investigated. For some personality indicators, like being quiet, associations with other personality states were

more than 1 standard deviation higher than associations with personality problems, while others, like outgoing, showed the opposite pattern. However, personality problems were more strongly associated with personality states than with other personality problems. Degree centrality estimates for Study 1 were more equivocal. Together these findings suggest that, in general, personality problems tend to overlap with personality states, with little indication that problems and state constitute separable entities.

In study 2, for all personality states, strength centrality indicated that the strongest associations are with other

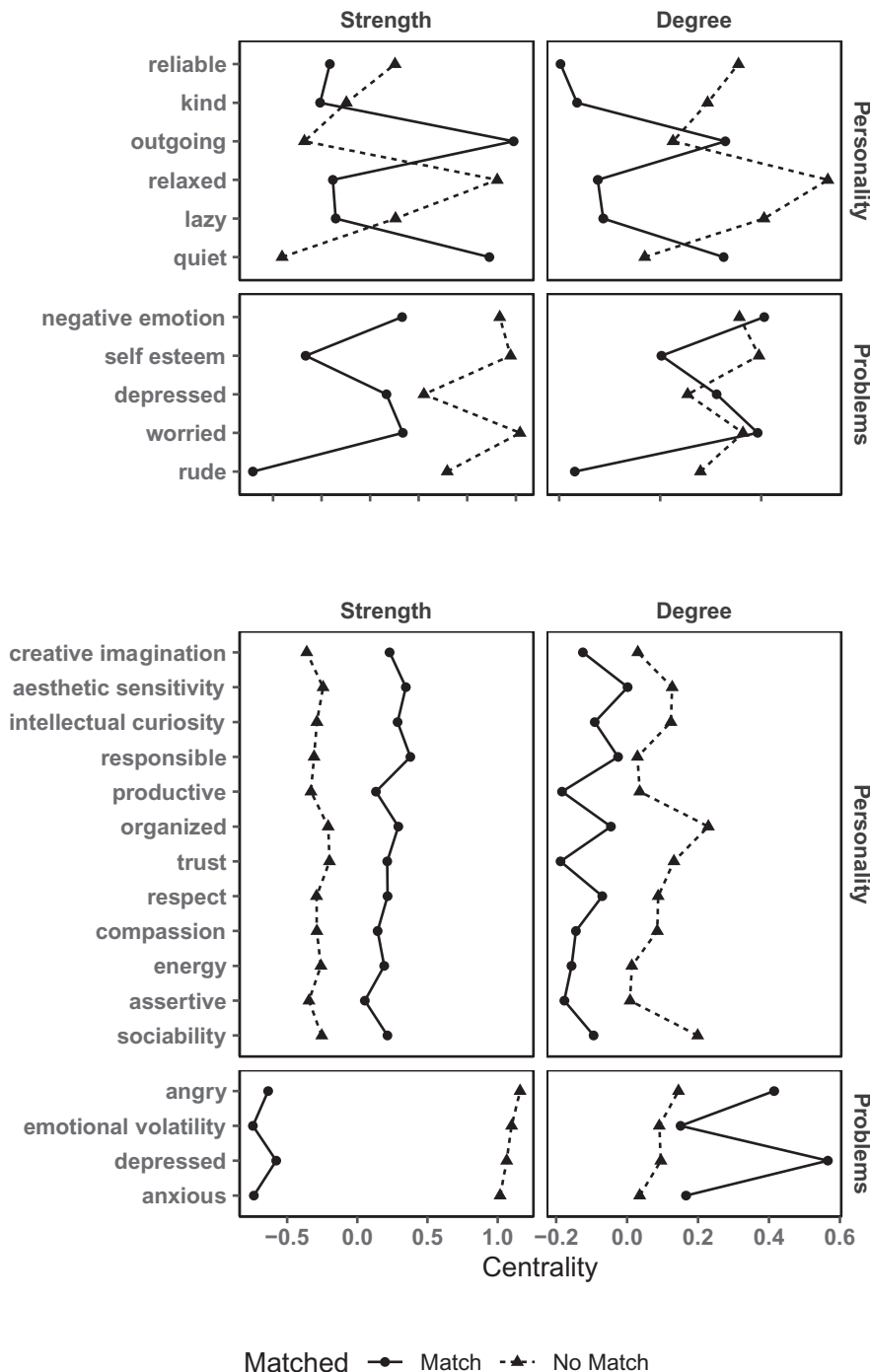


FIGURE 3 Average z -scored strength and degree centrality for Study 1 top row and Study 2 bottom row. Matched indicates personality or problem centrality indices that capture relationships with other personality or problem indicators (i.e., personality–personality and problem–problem associations), while Not Matched associations are those where personality and problem associations are related to one another. z -scores were created by standardizing GIMME model coefficients for each person separately then averaging across all participants

personality variables (i.e., the matched associations in the upper personality row), with matched personality–personality variables being almost 0.5 standard deviations stronger than unmatched, personality–problem associations. Problems showed the opposite pattern, with unmatched personality–problem associations having higher associations than matched problem–problem associations. By contrast, degree centrality indicated that there was little difference in the relative number of connections between personality and problems, matched or unmatched, except for angry and depressed, which were had greater number of connections with other problems. It is possible that these indicators index greater severity (or more pure) personality problems; if so, this is evidence that these problems covary within person more strongly with other problems.

3.2 | Do personality states and personality problems differ depending on levels of psychopathology?

We next examined whether between-person differences in nomothetically assessed depression (our only nomothetic measure of psychopathology in these samples) discriminated among associations between personality states and personality problems. It is possible that those who experience higher levels of depression have more personality problems and thus potentially differential relationships with personality states. To examine this possibility, we both compared people who met a cutoff score on the CES-D inventory to those that did not have elevated levels of depression as well as examining CES-D scores continuously. Then we replicated our two types of comparisons discussed above: frequency and centrality. These results are presented as a broad overview below. The full model results, including the models themselves, are available in the online materials.

First, clinically suggested cutoffs and continuous CES-D scores predicted almost no edge-level associations between and within personality and personality problems. These results were highly convergent across both cutoff and continuous CES-D measures. In Study 1 only 4/55 (7.3%; cutoff and continuous) and in Study 2 only 4/120 (3.3%; cutoff) and 7/120 (5.8%; continuous) of tested associations had 95% Bayesian Credibility Intervals that did not overlap with zero. In Study 1, one of the predicted associations was between problem states, while the remaining three were between personality and personality problems. In Study 2, 6/7 of the significant continuous associations were among personality states with other between problems. For cutoffs, 3/4 were among personality states, while 1/4 was across personality and problems. In general, depression cutoffs and levels did not differentiate among the

strength of associations within and between personality and personality problems.

These findings are further depicted by examining the frequency with which associations between personality and problems were observed across studies and cutoff groups. As is clear in Figure 4, those that met cutoffs for depression did not have different idiographic structures in terms of frequency of edges (Figure 4). In both samples, the associations between personality state and problems were similar. Notably, is that there were no broad differences in depressed problems despite groups being selected based on levels of depression. Also, the associations of personality states with themselves and personality problems with themselves were also comparable. In other words, the heterogeneity in structure was similar across the two groups. These findings suggest that those experiencing some elevated problems do not show differential within-person associations with either within problems or across problems and states.

As a second test we examined the node centrality. As with edge weights, we first predict strength and degree centrality from CES-D cutoffs and continuous scores (see full results tables in the online materials). These results are descriptively summarized in Figure 5, which is analogous to Figure 3 but split by CES-D cutoffs. In Study 1, CES-D cutoffs and levels predicted 5/22 (22.3%) and 2/22 (9.1%) of tested associations with strength centrality, respectively. CES-D cutoffs predicted 9/22 (40.9%) of degree centrality measures and CES-D levels predicted 7/22 (31.8%). These tended to be evenly split across matched and unmatched associations but were almost completely unique to associations involving personality states. Moreover, the magnitude of the effects was small. In Study 2, CES-D levels predicted only 2/32 (6.3%) degree centrality measures and CES-D cutoffs predicted none. In both our samples, we found mostly similar associations between the depressed and the not depressed group. Overall it appears as though the between person structure and level of psychopathology does not impact the within person association between personality states and manifestations of psychopathology.

3.3 | Do situations change the observed associations between personality states and personality problems?

Next we investigated how the structure of personality states and personality problems changed as a function of being in a particular situation. To do so, we examined two relatively stressful situations in Study 2: being in an argument and stressed about schoolwork, both of which may make personality problems more prevalent and pertinent. The basic goal was to see whether accounting for situations explained

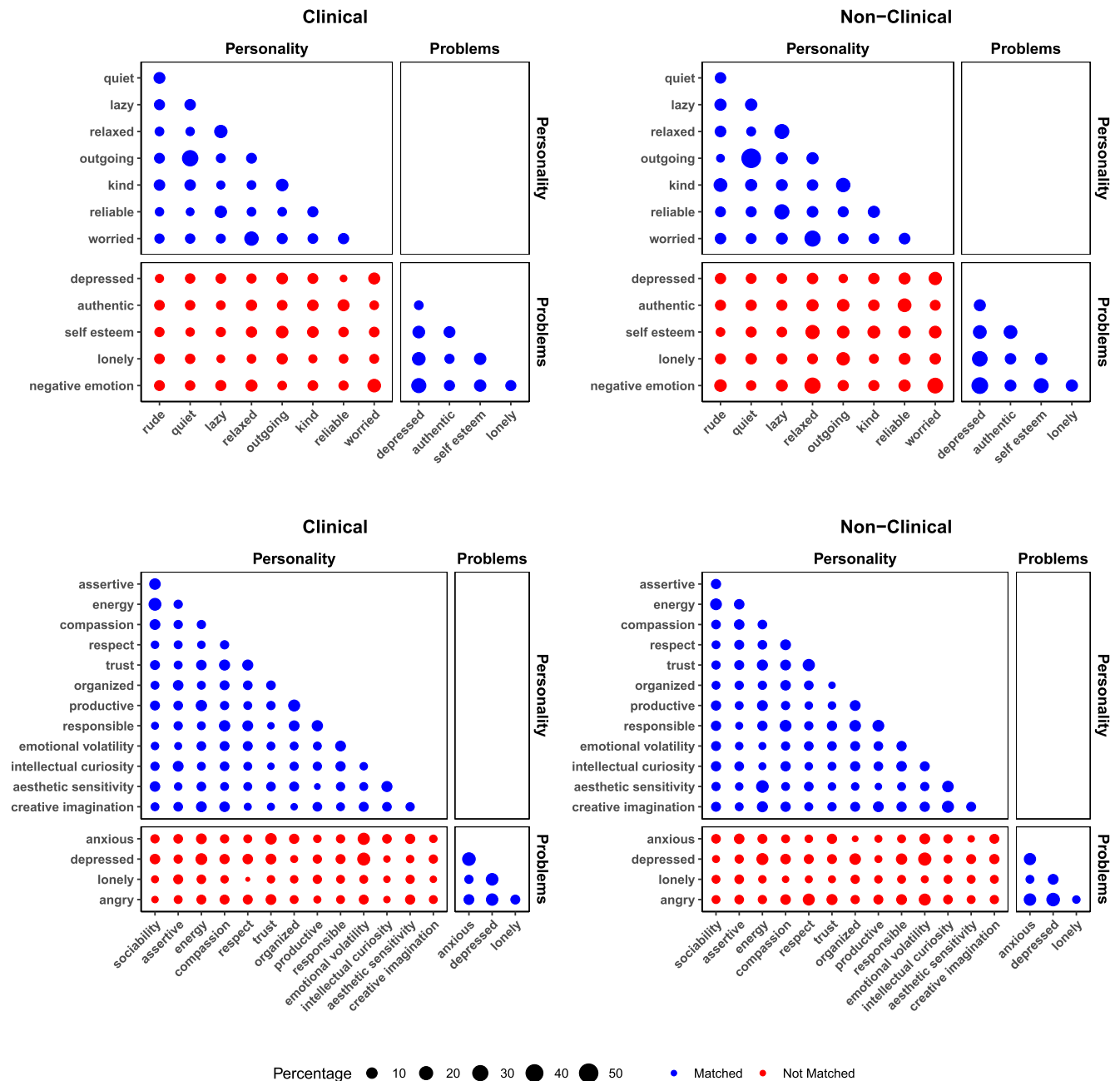


FIGURE 4 Size of circles represent the percentages of edges present in each of the samples idiographic personality structures in Study 1 (top row) and Study 2 (bottom row) for depressed versus non-depressed groups

variance previously accounted for in the associations among other personality states and personality problem indicators. The full results of these models are available in the online materials. Overall, the pattern of results for models accounting for either situation roughly mirror the associations present when not in those stressful situations (Figure 6). For example, accounting for situations did not impact the strength of association of personality problems with personality problems (i.e., parallel, almost completely overlapping lines in the first and third panels of the bottom row in Figure 6).

4 | DISCUSSION

The current study examined the overlap between personality and psychopathology at a low level of analysis: moment-to-moment manifestations at the idiographic, $N = 1$ level. In contrast to other perspectives that describe the overlap either as etiological (where the two are separate constructs but can influence one another across time) or measurement (where the two share content and the relative amount is investigated through structural analyses), our approach incorporates elements of both time as well as structure. Three broad findings

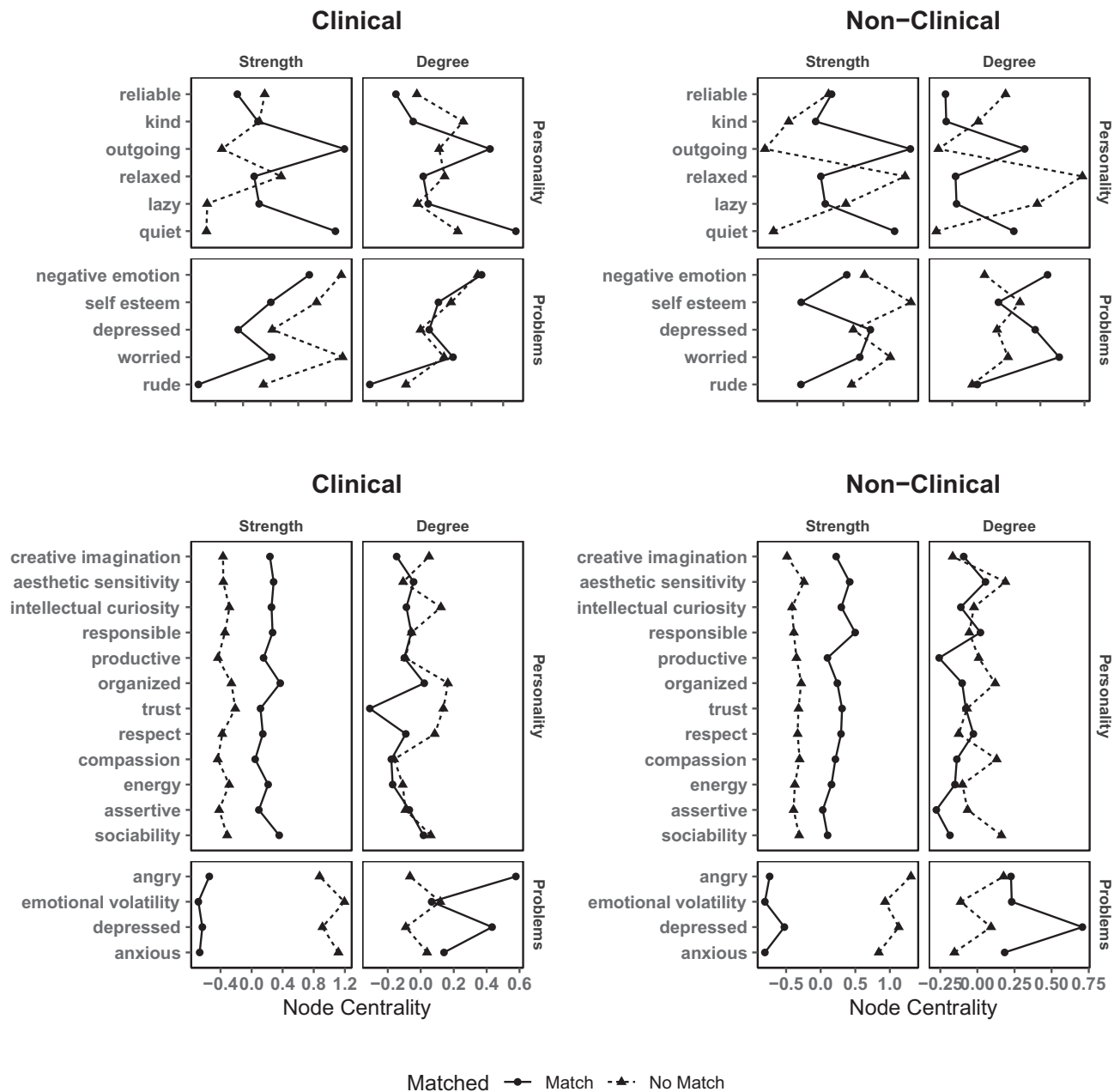


FIGURE 5 Average z-scored strength and degree centrality for Study 1 top row and Study 2 bottom row for depressed versus non-depressed groups. Matched indicates personality or problem centrality indices that capture relationships with other personality or problem indicators (i.e., personality–personality and problem–problem associations), while Not Matched associations are those where personality and problem associations are related to one another. z-scores were created by standardizing GIMME model coefficients for each person and model separately then averaging across all participants

emerged: First, people differ in their idiographic personality functioning structures. For some, personality states and personality problems are deeply intertwined. For others, they are separate and not related. Second, between-person differences in depression did not influence the overlap, indicating that between-person constructs are separate from within-person processes. Third, situations that were thought to bring out personality problems did not alter the association between personality states and personality problems. Broadly, these findings highlight that it is possible to separate personality

from one's problems. The problems one has may be related to personality states, but not necessarily for everyone.

4.1 | Variability in idiographic structure

The structures of the idiographic personality networks differed markedly from one another. At most, roughly 60% of the sample shared a common edge (e.g., when worried they were not relaxed). This heterogeneity in personality structure

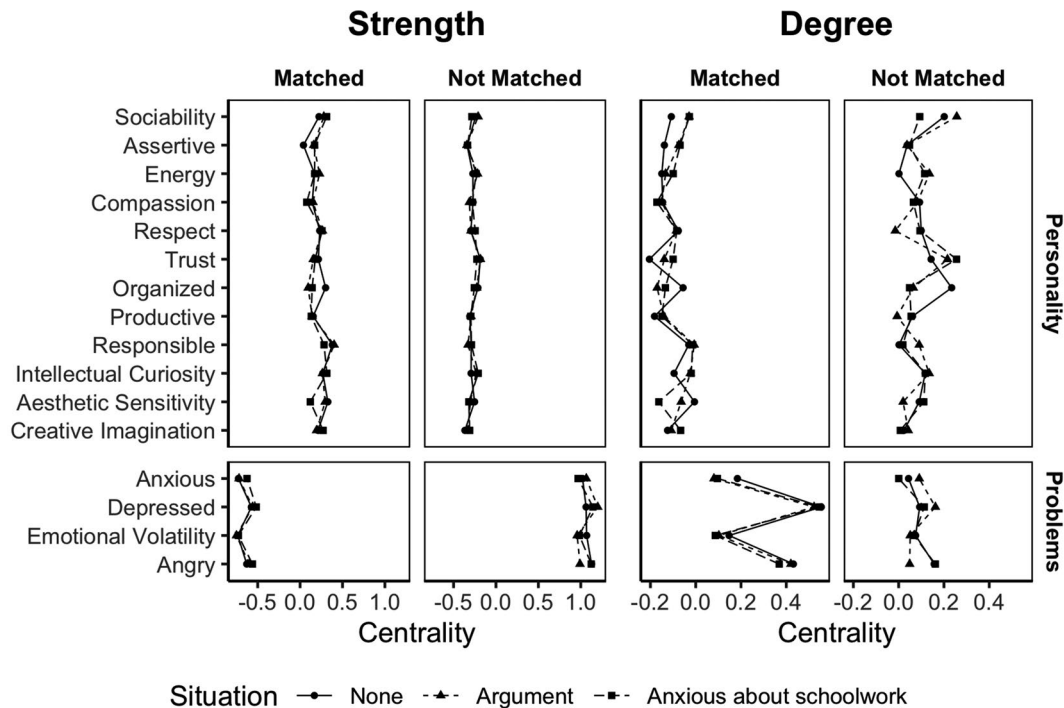


FIGURE 6 Average z-scored strength and degree centrality in Study 2 for models that account for no situations (None), arguments with friends or family members (Argument), or feeling anxious about schoolwork (Anxious about schoolwork). Matched indicates personality or problem centrality indices that capture relationships with other personality or problem indicators (i.e., personality–personality and problem–problem associations), while Not Matched associations are those where personality and problem associations are related to one another. z-scores were created by standardizing GIMME model coefficients for each person and model separately then averaging across all participants

was found across both samples, despite each having different operationalizations of personality states and personality problems. Differences in within-personality structure are common within normal range personality (Beck & Jackson, 2020a, 2020b), so it is not entirely surprising that differences in structure extend to more extreme levels of the personality dysfunction spectrum. Despite these differences, there were two typical associations that appeared. First, associations typically found at the between-person level were the most common at the within-person level (e.g., outgoing and quiet). These findings suggest that the within-person structure is not completely disconnected with the between-person structure, at least on average. Findings such as these are important if one wants to take between-person associations and apply them to process or mechanistic explanations, which are usually within-person. Thus, between-person models such as HiTOP may be beneficial at describing process relationships, at least for some people.

However, one needs to be cautious in ascribing seemingly between-person constructs to the individual level. At the simplest level, even if associations are shared by 60% of participants, that means that 40% of participants did not share them. When considering whether nomothetic traits can be mapped onto individuals, this is a nontrivial portion of the population who may be missed. In addition, taking our depression groups as an example, it would have been seemingly unproblematic

to assume that the two groups would differ in their day-to-day processes. If they did not, how useful is a depression diagnosis? In contrast to this assumption, our findings indicate that their within-person personality processes do not greatly differ from those that are not elevated in depression.

The second takeaway is that personality states were more likely to be strongly related to other personality states, whereas personality problems were associated similarly with states and problems. These findings suggest a difference within these two groupings, namely that normal-level functioning is (somewhat) separate from dysfunction, but that dysfunction is not separate from normal-level functioning. In other words, normal functioning is primarily dependent on other normal processes—someone's daily grind is impacted by the standard and typical minutia of the day. By contrast, personality problems are strongly related with problems—problems beget other problems—but they are also associated with daily “normal” functioning. These findings may arise due to our non-clinical samples as, on average, people will likely have relatively low levels of dysfunction, which attenuates any association with personality problems. However, we did not see any differences in associations among those who had elevated levels of depression, perhaps suggesting that normal functioning is more central to a person's day-to-day activities even with modest levels of dysfunction. Findings such as these should be explored more, but they offer up

potential reasons why clinicians may want to examine personality states in addition to personality traits. States may provide insight about what aspects of functioning are operating normally, offering a place of strength for the therapist to build upon. Or, personality states may offer clues to what may, at the moment appear to be low levels of a personality state but could lead to personality problems. For example, someone who is normally high on Agreeableness but is showing state associations with personality problems may suggest that Agreeableness related interpersonal problems may soon arise.

In general, personality problems were not well differentiated by personality states, such that there was not a pattern of states that distinguished between different problems. Findings such as these are also found at the between-person level (Kotov et al., 2010), which are often used as criticism for the utility of integrating personality within models of psychopathology. However, at the level of an individual, this issue does not exist. Even though at the average level there was not differentiation between how states were associated with different problems, within a person there was extreme heterogeneity among what states were associated with which problems. For some, depression was mainly associated with markers of Conscientiousness, whereas for others it was Extraversion. In other words, personality states could differentiate a person's problems, but these associations do not hold when averaged across people. Only when at the level of an individual do these associations become diagnostic.

4.2 | Is there a distinction between personality and psychopathology?

A fundamental disagreement within the longstanding question of how personality and psychopathology are related boils down to the lens one is viewing the question. Taking this question as a question of additive value, one can ask whether adding normal range personality adds value to the understanding of psychopathology. Given the extensive literature documenting the association between them, not to mention the acknowledgement of dysfunction existing on a continuum, personality appears to be a necessary but not sufficient component of the system. Given that it is a necessity, it makes little sense to disentangle the two, and thus they should be combined, such as with the HiTOP model.

Alternatively, rather than viewing psychopathology as a broad, between-person system, one can view it at the level of the person, idiographically. In other words, the person, including their problems, is a system, not two separate systems. As seen in our findings, a person and their problems are not identical for a non-trivial amount of people. For some, problems were not related to personality states; for others, problems were related to different states. Viewed at the level

of an individual, personality may be a *sufficient* but not a necessary component to psychopathology. It may be the case that problems arise for reasons not related to personality, such as through stressful environments. Or, it may be the case that for a particular person they are able to neatly segregate their dysfunction from their effective functioning. The cliché of a functioning alcoholic may be an appropriate analogy, where normal functioning is not impacted yet they may still be experiencing great internal dysfunction, effectively cleaving off two aspects of their personality.

Is one perspective right, is the other wrong? We believe both are correct depending on which level you want to view the association and what kinds of inferences you want to draw. The natural next question then is: what level of analysis should we be working in? The vast majority of psychological work, let alone psychopathology work, is rooted in between-person models. Less work exists at the idiographic level (though this is changing, see Wright & Woods, 2020). The nomothetic constructs described at the between-person level *may* be replicated at the level of any one individual, but they are not necessarily so. Instead, they represent constructs that are commonly important in understanding aggregates, rather than constructs that are important in understanding any given person.

More work is needed to build the bridge from the idiographic, within-person side to the nomothetic, between-person side. Can the between-person structure be translated down to the within-person structure? If so, for most people or for some? Is the within-person structure of personality functioning useful clinically? Or do only more extreme, personality problems provide utility? Extant work finds that between-person assessments, even categories such as personality disorders, prospectively predict important life outcomes and future diagnoses, often decades in advance (e.g., Gilbert et al., 2019). Surely there is something meaningful being assessed with between-person assessments. But what advantages do within-person idiographic personality structures hold? Do they add value above and beyond between-person assessments, especially given the increased difficulty in idiographic assessment? While idiographic assessments is thought to be “closer to the person” and thus more accurately describes the person *in situ*, there is a parallel to be made with personalized medicine, as currently the prospect of personalized medicine is more enticing than the results.

Addressing the questions above necessitate addressing what exists within personality and psychopathology's purview. The two can be integrated together to define a personality (trait) space, one that defines what constructs one is interested in. This space is said to exist on a continuum, from normal functioning to dysfunctional, and as a hierarchy ranging from higher order constructs, to more narrow range ones. The answer to personality and psychopathology overlaps then boils down to where to draw the dividing line in the sand. Our current attempt to

demarcate personality states and problems is one of many such possible groupings. While we drew from the literature, alternative groupings are just as defensible. We, however, ask whether the dividing line is useful in the first place. To the extent that it is, it operates as a bridge to two traditions, separated by history, but that (incidentally) share a common ancestor in idiographic assessment (see Beck & Jackson, 2021).

If idiographic assessment is to be useful for researchers as well as clinicians it is important to heed the advice of earlier idiographers that focus on the uniqueness of each person. Instead of assessing a standard battery of dysfunction, along with (maybe) some adaptive functioning components, it would be useful to ask a person what personality components are important to them. If asked, they will likely exist across a range of functioning, addressing both the dysfunctional components of their personality as well as their more adaptive. If pressed, the people will likely not be able to neatly distinguish between the two. For them, these are manifestations of who they are, both good and bad; together they define their personality.

4.3 | Limitations and future directions

While the current study examined personality and psychopathology in an empirically novel way, it is not without shortcomings. First, our measure of personality problems was not broad, nor was it developed to capture dysfunctional levels. Future research should assess more specific symptoms and/or direct measures of dysfunction. Further, while we selected participants who had elevated levels of depression, it is still unclear that clinical levels of dysfunction were experienced within the community samples. As such, we are unsure whether elevated levels of depression constituted problems, *per se*. Moreover, even among those reporting high levels of state depression, for example, it is not clear if this was clinically severe or just elevated for that person. Similarly, while we examined some key indicators of dysfunction, we omitted a number of components that may have differential relationships with personality states, potentially altering our conclusions.

Second, the choices in what is included in the idiographic network, including what items are assessed, how they were assessed, along with sample sizes, could all impact the findings and thus interpretation. For example, the samples sizes for observations per person were often below typically recommended sizes for the GIMME algorithm (Lane et al., 2019). Further, what items are included within the model can have consequential effects. While a broad personality assessment measure (for ESM assessments, at least) was included in one study, these items cannot capture all of normal range functioning, nor may items be appropriate for any one person. Idiographic assessment, at the core, is about identifying characteristics that are important for the individual. Thus, the items included, and thus a person's idiographic

network, may not be relevant for any particular individual. In other words, there is no statistical correction for missing idiographic characteristics.

Third, one of the impetuses of this study was to examine personality states and problems dynamically, incorporating how time influences personality manifestations. While these analyses were conducted and available in the online materials, there are a number of assumptions concerning the interpretation of lagged findings for our study and others. Foremost is that the association between states and problems operate on the 4-hr lag that was included within the model. This lag may not be appropriate for certain combinations of states and problems, and it may differ across people. Moreover, it may even differ across time within a person, depending on context for example, feelings of depression in the morning may influence my ability to work later on (productivity), but feelings of depression later in the day may not be relevant to a person's productivity because they are out of work and/or completed household chores prior. The former process may be especially important for this particular individual but could be lost after collapsing over context and time.

4.4 | Conclusion

To examine whether we could separate a person from their problems, we used an idiographic approach that incorporates both time and structure. For some, personality states and personality problems are deeply intertwined, but for others they are separate or weakly related. We hope that this method stimulates conceptualizations of personality–psychopathology overlap to move beyond mostly static, between person models to more dynamic individual models.

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CONFLICT OF INTERESTS

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ENDNOTES

¹ For both parsimony and ease of interpretation, all contemporaneous results will be presented as undirected associations. Directed contemporaneous results, which showed the same pattern of results as undirected results, are available in the online materials.

² In the present study, because of differences in the number of indicators across studies as well as for personality and problems, all degree centrality estimates were normalized by the number of possible connections an indicator could have had.

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