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## Are there meaningful individual differences in temporal inconsistency in self-reported personality?



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### ABSTRACT

The current project had three goals. The first was to examine whether it is meaningful to refer to across-time variability in self-reported personality as an individual differences characteristic. The second was to investigate whether negative affect was associated with variability in self-reported personality, while controlling for mean levels, and correcting for measurement errors. The third goal was to examine whether variability in self-reported personality would be larger among young adults than among older adults, and whether the relation of variability with negative affect would be stronger at older ages than at younger ages. Two moderately large samples of participants completed the International Item Pool Personality questionnaire assessing the Big Five personality dimensions either twice or thrice, in addition to several measures of negative affect. Results were consistent with the hypothesis that within-person variability in self-reported personality is a meaningful individual difference characteristic. Some people exhibited greater across-time variability than others after removing measurement error, and people who showed temporal instability in one trait also exhibited temporal instability across the other four traits. However, temporal variability was not related to negative affect, and there was no evidence that either temporal variability or its association with negative affect varied with age.

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### 1. Introduction

Researchers who have tried to identify and understand what underlies the variations in personality assessments have often examined variability in personality responses that occur within a person across roles and situations (e.g., Baird, Le, & Lucas, 2006; Bleidorn & Koedding, 2013; Diehl, Hastings, & Stanton, 2001; Donahue, Robins, Roberts, & John, 1993). However, another type of variability is inconsistency in measures of personality over time, which has received less attention because it is often interpreted as measurement error (e.g., Chmielewski & Watson, 2009). Although measurement error could be responsible for some of the temporal instability, it is also possible that there are meaningful individual differences in variability over time. That is, in addition to differences in mean levels of personality traits, people might also differ in the degree to which their self-ratings of personality are stable over time.

The first goal of the current project was therefore to examine whether it is meaningful to refer to across-time variability, over

an average interval of about 3 years, as an individual differences characteristic that is manifested across different self-reported personality traits. We investigated variability occurring in a measure of the “self” in general, that is not related to specific situations, and were interested in the possibility that inconsistency reflects a general characteristic of the individual that is manifested across different traits.

If people differ in the degree to which they exhibit across-time variability in self-reported personality, it is worth considering what that variability might reflect. Researchers who have investigated individual differences in personality variability across roles and situations have often found that negative affect and related constructs were associated with a greater degree of personality variability (for a meta-analysis, see Bleidorn & Koedding, 2013). These results have been interpreted as support for the idea that within-person variability in personality reflects a low level of emotional adjustment and psychological well-being (e.g., Bleidorn & Koedding, 2013). In the present paper, we were interested in whether the association between variability and negative affect was observed when examining short-term consistency instead of cross-role consistency. Because there are many reports of significant relations between trait levels and affect, we examined whether negative affect predicts cross-temporal variability of

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self-ratings of Big Five traits, while controlling the mean levels of the traits (see Baird et al., 2006).

One of the most important factors affecting personality stability is age. A meta-analysis reported by Roberts and DelVecchio (2000) showed that test–retest correlation coefficients increased from .31 in childhood to .64 at age 30, and then reached a plateau of about .74 between ages 50 and 70. However, previous work on long-term change in personality has either confounded systematic change and short-term fluctuation, or did not control for measurement error (see however Kandler et al., 2010). The current project overcame these two limitations and examined whether variability over time in self-ratings of personality is greater among younger adults than among older adults, after removing variability associated with systematic change in personality measures and controlling for measurement error.

Another related issue regarding temporal inconsistency in personality is whether it reflects the same phenomenon at different ages. Because young adulthood is a period of transition, involving biological and psychological maturation after the crisis of puberty, transformation of social relationships, and finding oneself to “become a person” (Arnett, 2000), it is possible that variability in personality at young ages does not have the same meaning as it does at older ages (Lewis, 2001). In particular, variability at young ages may reflect a “core” self still in progress, while variability at older ages may reflect more incoherence or even pathology. To our knowledge, only one study examined relations between personality inconsistency and well-being as a function of age (Diehl et al., 2001). The third goal of the current project was to examine whether temporal inconsistency in self-reported personality shows the same relations with negative affect at different ages.

Among the desirable conditions for providing meaningful answers to these questions are a moderately large sample of participants, reliable assessments of major dimensions of personality and affect, and at least three measurement occasions to distinguish systematic trends from short-term fluctuation. The current project attempted to incorporate these characteristics by examining data from samples of either 510 (with three occasions) or 771 (with two occasions) adults between 18 and 92 years of age who completed reliable measures of self-reported personality and affect. In addition, the current project examined across-time variability with variability represented by latent variables rather than observed variables. Latent variables allow a focus on variance that is common to the indicators assessing each construct, and thus are free from measurement error (Loehlin, 2004). Finally, because there have been previous reports of systematic change in personality traits (e.g., Roberts & Mroczek, 2008), analyses in the current project controlled influences of systematic change when examining correlations among the measures of temporal variability to ensure that the correlations represent non-systematic variability.

## 2. Method

### 2.1. Participants

Participants were community volunteers who completed at least two measurement occasions, and had Mini-Mental State Examination (MMSE; Folstein, Folstein, & McHugh, 1975) scores above 27 at each occasion. Participants were recruited by newspaper advertisements, flyers, and referrals from other participants. They were paid for their participation.

The 2-occasion sample consisted of 771 participants between 18 and 92 years of age who completed only two measurement occasions. The 3-occasion sample consisted of 510 between 18 and 86 years of age who completed three measurement occasions. The two samples were independent of each other. The interval

between Time 1 (T1) and Time 2 (T2) varied between 0.21 years and 7.84 years across participants, with a mean of 2.54 years for the 2-occasion sample. It varied between 0.86 years and 5.03 year across participants, with a mean of 2.15 for the 3-occasion sample. The interval between Time 1 (T1) and Time 3 (T3) varied between 1.74 and 8.16 years across participants, with a mean of 5.07 years. There were no significant correlations between age and length of the intervals ( $r = -.03$  in the 2-occasion sample, and  $r = -.06$  in the 3-occasion sample). Comparisons of the characteristics at T1 of the two samples are summarized in Table 1. In most respects the two samples were similar.

As a means of evaluating the representativeness of the sample, age-adjusted scaled scores are provided (see Table 1) for four tests from the Wechsler Adult Intelligence Scale III (Wechsler, 1997a) and the Wechsler Memory Scale III (Wechsler, 1997b). Scaled scores are adjusted for age and have means of 10 and standard deviations of 3 in the nationally representative normative samples (Wechsler, 1997a, 1997b). Values in Table 1 indicate that mean cognitive scores in our samples were higher than national mean scores.

### 2.2. Measures

#### 2.2.1. Personality

Personality was self-rated with the 50-item version of the Big-Five Broad Domains (from the International Personality Item Pool; Goldberg, 1992, 1999), which are Emotional Stability, Extraversion, Openness, Agreeableness, and Conscientiousness. The internal consistency coefficients of the scales for each sample and measurement occasion were all acceptable, ranging from .77 to .90.

Affect. Measures of affect included the Center for Epidemiological Studies-Depression Scale (CES-D; Radloff, 1977), the State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983), and the Negative Affect Scale of PANAS (Positive and Negative Affect Schedule; Watson, Clark, & Tellegen, 1988). The internal consistency coefficients of the scales ranged from .88 to .93.

**Table 1**  
Comparison of the two samples on characteristics at T1.

	T1–T2 sample	T1–T2–T3 sample	<i>d</i>
N	771	510	
Female %	66.3	68.1	
Age	53.08 (17.56)	54.23 (15.36)	.07
Health	2.15 (.84)	2.13 (.87)	.02
Education	15.91 (2.59)	16.07 (2.63)	.06
CES-D	10.99 (8.34)	10.25 (8.00)	.09
Anxiety	35.15 (10.19)	34.60 (10.10)	.05
MMSE	29.04 (.97)	29.15 (.95)	.11
Age-adjusted scaled scores			
Vocabulary	12.82 (2.70)	13.30 (2.62)	.18
Digit symbol	11.82 (2.74)	11.84 (2.74)	.01
Log memory	12.20 (2.73)	12.43 (2.57)	.09
Recall	12.27 (3.09)	12.87 (3.12)	.19
Traits			
Emotional Stability	34.17 (7.87)	34.77 (8.29)	.07
Extraversion	31.63 (7.69)	31.21 (7.70)	.05
Openness	36.55 (6.37)	36.97 (6.30)	.07
Agreeableness	41.14 (5.60)	41.10 (5.44)	.06
Conscientiousness	36.94 (6.51)	37.40 (6.07)	.07

*Note:* Health was self-rated on a scale ranging from 1 (*excellent*) to 5 (*poor*). Education is the number of years of education. Depression was assessed with the Center for Epidemiological Studies-Depression Scale (CES-D; Radloff, 1977). Anxiety was assessed with the State version of the State-Trait Anxiety Inventory (Spielberger et al., 1983). Average scaled scores is the average of the age-adjusted scores for four tests from the Wechsler Adult Intelligence Scale III (Wechsler, 1997a) and the Wechsler Memory Scale III (Wechsler, 1997b). Personality was self-rated with the 50-item version of the Big-Five Broad Domains (Goldberg, 1992, 1999). Values in parentheses are standard deviations. *d* values are absolute values of Cohen's *d*.

### 3. Results

Because estimates of variability may be less reliable than estimates of the mean, we examined mean level, variability, and systematic change with latent variables. To obtain a set of observed indicators for the latent variables, we followed classical work on item parceling (Little, Cunningham, & Shahar, 2002) and reduced the dimensionality of the raw data by combining the 10 trait items to constitute three separate parcels. The same parcels were used to define latent constructs of mean level, variability and systematic change.

Because significant variance in the measures of across-time variability is a prerequisite to detect any relation between variability and other variables, we first examined whether there were significant individual differences in the measures of across-time variability in personality. Temporal variability can be examined with a minimum of two occasions, but systematic increases or decreases cannot be distinguished from unsystematic variability with only two occasions. However, the systematic trends can be statistically removed to focus on non-systematic variability when there are three or more occasions. Because some of the participants in the current project completed only two occasions and others three occasions, separate analyses were carried out in the two groups to determine whether the pattern of relations of within-person variability differed according to how variability was assessed.

The analyses conducted on the 2-occasion data examined T2–T1 difference scores for each parcel as the indicators of a latent variable representing personality variability. However, because any systematic linear trends could inflate the estimates of within-person variability, and confound them with short-term fluctuation, systematic trends were removed from the 3-occasion data with linear regression equations predicting parcels from occasion number for each individual. Standard deviations of the regression residuals for each parcel were then used as the measure of within-person variability in each trait for each participant.

Estimates of variance for the ten latent variables (5 personality traits in 2 separate samples) are reported in Table 2. Each of the latent variables representing within-person variability in personality had variance that was significantly greater than zero ( $p < .01$ ). These results therefore indicate that it was meaningful to examine whether variability factors correlated each with other, and whether negative affect or age were significant predictors of variability on each personality trait.

Correlations among the latent variables representing variability across time were next examined, while controlling systematic differences in the trait for the 3-occasion data (see Fig. 1). We used T1–T2–T3 slopes computed for each parcel in the 3-occasion sample as the indicators of a latent variable representing systematic

change in the trait. Figure 1 shows the structural model we used to examine correlations among latent constructs representing variability in traits for the 3-occasion data. In the 2-occasion data, variability was defined by the T2–T1 difference scores, and because systematic change and short-term fluctuation cannot be separated on 2-occasion data, systematic change was not controlled.

The two factor models showed reasonable fit to the data. With the exception of the relations between Emotional Stability and Openness and between Extraversion and Conscientiousness in the 2-occasion data, all relations among latent variables representing temporal instability were positive and significantly different from zero (see Table 3). These results are therefore consistent with the idea that temporal instability is a characteristic of individuals that is manifested across different self-reported traits. That is, people who are inconsistent, in the sense of exhibiting across-time variability in one self-reported personality trait, are also inconsistent in other self-reports of personality traits.

The second question was whether across-time variability in self-reported personality traits was related to negative affect, after controlling the relation between mean level of personality and negative affect. Negative affect was represented as a latent variable based on the average scores across occasions of the CES-D Depression scale, the Anxiety-trait scale, and the Negative Affect scale. Higher levels on the factor corresponded to higher levels of negative affect. Standardized coefficients for the manifest variables on the latent variable for CES-D, Anxiety, and Negative Affect were, respectively, .93, .89 and .70 in the 2-occasion sample, and .94, .91 and .69 in the 3-occasion sample.

Figure 2 shows the structural model used to regress the affect factor onto latent variables representing the level and variability in traits. Sex and intervals between T1 and T3 assessments were included as other predictors.

The standardized coefficients of these analyses are reported in Table 4 for the 2-occasion sample, and in Table 5 for the 3-occasion sample. All of the models had reasonable fits to the data.

Inspection of Tables 4 and 5 reveals that the results for the two samples were very similar. Higher mean levels of negative affect were associated with lower levels of Emotional Stability, Extraversion, Agreeableness and Conscientiousness. Importantly, however, variability on traits was not related to affect either before or after controlling for variance in mean level.

The final questions of interest were whether temporal variability in self-reported personality varied as a function of age, and whether the relations between variability and affect were stronger at older ages than at younger ages. Inspection of Tables 4 and 5 reveals that age was not a significant predictor of any of the variability measures, and that none of the interactions between age and affect in the prediction of variability was significant after controlling for variance in mean level.

Additional analyses examined the relationships between variability and affect in three separate age groups (18–44; 45–65; 66 and over). Effect sizes (Cohen's  $d$  values) for the differences in the relationships between variability and affect across the three age groups were modest, with absolute value ranging from .00 to .36, a median of .08 and a mean of .11.

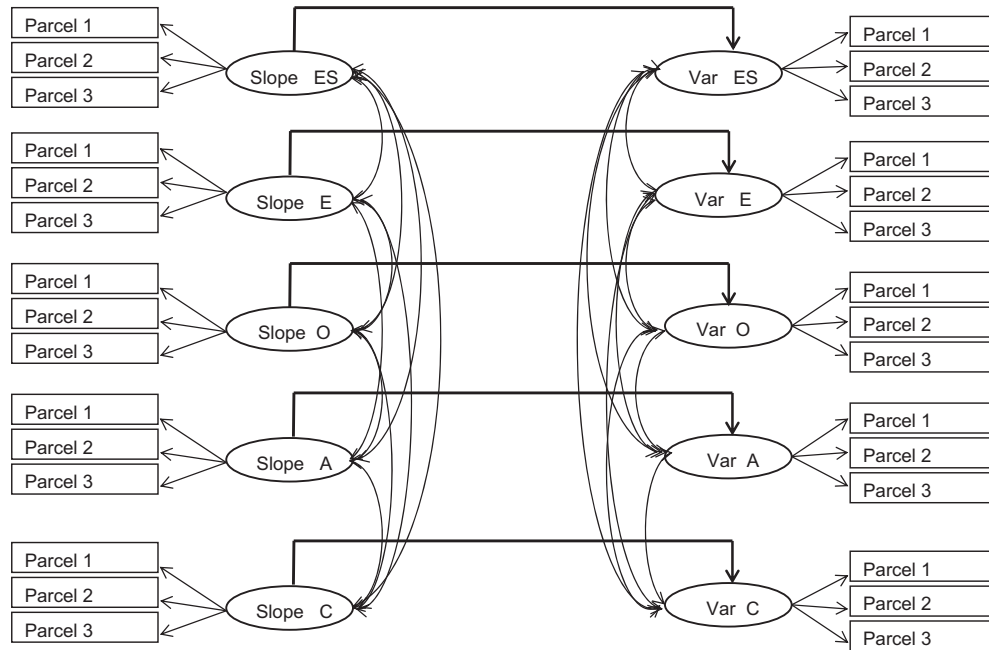
### 4. Discussion

The current study was undertaken for three purposes. The first goal was to examine whether it is meaningful to refer to across-time variability in self-reported personality as an individual differences characteristic manifested across different personality traits that captures information not available in the mean value of the trait. Two results were consistent with the hypothesis that within-person variability in self-reported personality is a

**Table 2**  
Estimates of variance in latent factors of variability.

	Estimate	SE	z	p
<i>2-occasion sample</i>				
Variability in Emotional Stability	1.95	.26	7.51	.0001
Variability in Extraversion	.74	.18	4.24	.0001
Variability in Openness	.54	.14	3.83	.0001
Variability in Agreeableness	.84	.18	3.97	.0001
Variability in Conscientiousness	.67	.18	3.86	.0001
<i>3-occasion sample</i>				
Variability in Emotional Stability	.29	.05	5.81	.0001
Variability in Extraversion	.16	.04	3.70	.0001
Variability in Openness	.21	.06	3.77	.0001
Variability in Agreeableness	.19	.04	4.73	.0001
Variability in Conscientiousness	.18	.05	3.45	.0001

Note: Personality was self-rated with the 50-item version of the Big-Five Broad Domains (Goldberg, 1992, 1999).

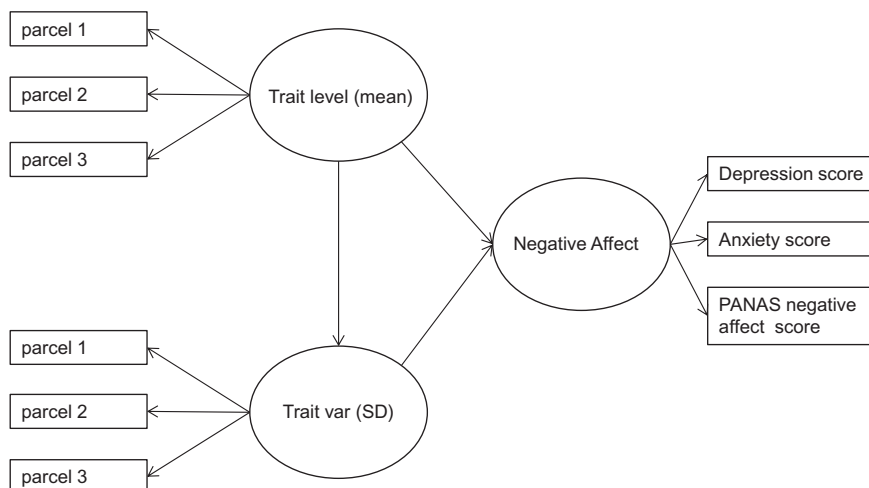


**Fig. 1.** Illustration of the factor model used to examine correlations among the latent variables representing variability in self-ratings of personality traits, on the 3-occasion data. Residuals for each observed variable are not illustrated for the sake of simplicity.

**Table 3**  
Correlation coefficients among latent variables representing variability in self-reported personality traits.

			Estimates	
			2-occasion data	3-occasion data
Variability in Emotional Stability	↔	Variability in Extraversion	.27*	.51*
Variability in Emotional Stability	↔	Variability in Openness	.07	.52*
Variability in Emotional Stability	↔	Variability in Agreeableness	.23*	.45
Variability in Emotional Stability	↔	Variability in Conscientiousness	.28*	.50*
Variability in Extraversion	↔	Variability in Openness	.28*	.65*
Variability in Extraversion	↔	Variability in Agreeableness	.45*	.69*
Variability in Extraversion	↔	Variability in Conscientiousness	.18	.61*
Variability in Openness	↔	Variability in Agreeableness	.38*	.62*
Variability in Openness	↔	Variability in Conscientiousness	.46*	.55*
Variability in Agreeableness	↔	Variability in Conscientiousness	.51*	.46

\*  $p < .01$ .



**Fig. 2.** Factor model of level and variability in traits and their prediction by the negative affect factor. Residuals for each observed variable are not illustrated for the sake of simplicity.

**Table 4**  
Predictors (standardized coefficients) of mean trait levels and variability, and Negative affect, before and after control of mean, in the 2-occasion sample (see Fig. 2).

Model 1	Mean trait levels					Trait variability over T1–T2 before control of mean					Trait variability over T1–T2 after control of mean				
	ES	E	O	A	C	ES	E	O	A	C	ES	E	O	A	C
Age	-.19 <sup>†</sup>	-.02	-.05	.09	.25 <sup>*</sup>	-.11	-.03	-.03	.03	-.15	-.07	-.04	-.04	.09	-.03
Sex	-.10 <sup>†</sup>	.08	-.05	.36 <sup>*</sup>	.15 <sup>*</sup>	-.03	-.06	.01	-.06	.06	-.05	-.06	-.02	.15	.13
Neg. Affect	-.81 <sup>†</sup>	-.22 <sup>*</sup>	-.07	-.13 <sup>†</sup>	-.34 <sup>*</sup>	-.03	-.02	.06	.09	.03	-.04	.02	.07	-.07	.01
Age × Sex	.01	.00	.07	-.02	-.09	-.05	-.02	.00	.01	.00	-.04	-.02	.03	-.02	-.04
Age × Affect	.04	.04	-.08	.05	.02	.06	.04	.01	-.02	-.02	.08	.04	-.01	-.02	-.02
Sex × Affect	-.31 <sup>†</sup>	-.09	.01	-.06	-.13 <sup>†</sup>	.08	.12	.03	.15	.07	.02	.12	.05	.10	.01
Age × Sex × Aff	-.03	.02	.11 <sup>*</sup>	.03	.10	-.04	.03	-.01	.01	.09	-.05	.03	-.02	.04	.14
Length intervals	.03	.02	.06	.06	.07	.15 <sup>*</sup>	.01	.05	.02	.02	.16 <sup>*</sup>	.01	.07	.05	.05
Mean trait level						Not relevant					-.20 <sup>*</sup> -.04   -.29 <sup>*</sup> -.58 <sup>*</sup> -.47 <sup>*</sup>				

Note: Age<sup>2</sup> and age<sup>3</sup> terms were also examined. Because there were few significant interactions on the IIV measures, they were ignored in the other analyses. Negative affect factor is predicted by mean trait levels and variability (see Fig. 2).

<sup>†</sup>  $p < .01$ .

**Table 5**  
Predictors (standardized coefficients) of mean trait levels and variability, and Negative affect, before and after control of mean, in the 3-occasion sample (see Fig. 2).

Model 1	Mean trait levels					Trait variability over T1–T3 before control of mean					Trait variability over T1–T3 after control of mean				
	ES	E	O	A	C	ES	E	O	A	C	ES	E	O	A	C
Age	.18 <sup>*</sup>	.14 <sup>*</sup>	.04	.18 <sup>*</sup>	.12	-.04	-.01	.02	-.05	-.02	.01	.00	.04	.02	.02
Sex	-.14 <sup>†</sup>	.07	-.06	.38 <sup>*</sup>	.15 <sup>*</sup>	-.04	-.06	-.04	-.12	-.04	-.08	-.05	-.06	.05	.00
Neg. Affect	-.81 <sup>†</sup>	-.25 <sup>*</sup>	-.07	-.27 <sup>*</sup>	-.36 <sup>*</sup>	.02	.04	.07	.04	.07	.01	.04	.07	.02	.06
Age × Sex	.03	-.01	.06	-.06	-.10	-.01	-.01	-.06	.02	-.03	-.01	-.01	-.03	-.01	-.05
Age × Affect	-.06	-.05	-.04	-.14 <sup>†</sup>	.03	.00	.03	.10	.10	.10	-.02	.02	.18	.04	-.11
Sex × Affect	-.32 <sup>†</sup>	-.04	.03	-.04	-.09	.02	.18 <sup>*</sup>	.08	.13	.08	-.08	.18	.08	.11	.05
Age × Sex × Aff	.02	.08	-.05	-.02	.06	.05	.01	-.10	-.02	.10	.06	.02	-.12	.03	.12
Length interval	.08	-.12	.01	.01	-.05	-.05	-.03	-.12	.01	-.08	-.03	-.04	-.12	.00	-.09
Mean trait level						Not relevant					-.27 <sup>*</sup> -.25 <sup>*</sup> -.33 <sup>*</sup> -.45 <sup>*</sup> -.35 <sup>*</sup>				

Note: Age<sup>2</sup> and age<sup>3</sup> terms were also examined. Because there were few significant interactions on the IIV measures, they were ignored in the other analyses. Negative affect factor is predicted by mean trait levels and variability (see Fig. 2).

<sup>†</sup>  $p < .01$ .

meaningful individual difference characteristic. First, the results revealed that some people exhibit greater across-time variability than others after removing measurement error. And second, moderate to strong correlations among the measures of temporal instability in different traits were found, suggesting that people who show temporal instability in one self-reported trait also exhibit temporal instability across the other self-reported four traits, which implies that the temporal variability cannot simply be attributed to noise or random fluctuation. Furthermore, the findings appear robust because the results were similar across the two independent samples of participants with two and three measurement occasions.

The finding that across-time variability in self-ratings of personality is an individual differences characteristic that captures information not available in the mean value of the trait has important implications for future research. First, it demonstrates that interpreting short-term fluctuation as completely attributable to measurement error is inaccurate. Second, although it is not yet clear whether the temporal variability reflects true variability in the levels of the traits or merely variability in the individual's interpretation or perception of his or her traits, the existence of individual differences in variability suggests that the reports may not have the same meaning in everyone, which could threaten the validity of these self-reports. Researchers therefore need to be cautious when interpreting change in self-reported personality because some of what is interpreted as change may reflect the individual's degree of temporal inconsistency.

The second goal was to examine whether temporal instability was related to negative affect. As expected from past research, higher levels of Emotional Stability, Extraversion, Agreeableness and Conscientiousness were related to lower levels of negative affect in both the 2-occasion and 3-occasion samples. However,

there was very little evidence of unique associations between within-person variability on self-reported traits and negative affect before and after controlling for mean levels.

At least two types of explanations could be proposed to account for the apparent inconsistency between our findings and prior reports of more systematic relations between variability in self-reported personality and negative affect. First, the discrepancy may have to do with the type of variability assessed. That is, previous studies have primarily investigated the cross-role variability – that is the self at the same point in time but in different social roles or situations, while in the current study the focus was on variability over time in the general self. It is therefore possible that cross-role or cross-situation variability and temporal variability do not reflect the same dimensions. Cross-role or situational variability may reflect how many “masks” the respondent can use, while variability in the general self over time may reflect fluctuation in how he/she judges himself/herself from an occasion to another. In addition, completing the two measures may involve different memory processes. That is, measures of cross-role or cross-situation variability may rely more on the efficiency of episodic memory, requiring remembering specific roles, situations or states. In contrast, measures of the general self may rely on semantic memory, requiring the activation of general ideas of the self (Robinson & Clore, 2002).

A second interpretation of the discrepancy between our findings and prior reports may have to do with the sample age investigated. Previous studies used college samples (e.g., Baird et al., 2006; Donahue et al., 1993; Sheldon, Ryan, Rawsthorne, & Ilardi, 1997) while the current project covered a wider age range sample (18–92). Although this explanation seems unlikely because we did not find any age differences in variability in the current project, it is still possible that more changes in personality occur in college



students than in adults beyond college age, and that the personality changes in young adults are driven by the experience of negative affect.

The third goal was to investigate whether variability is greater at certain ages than others, and whether the relations between variability and affect are the same at different ages. However, there was no evidence that temporal variability of traits was associated with age, and no indication of an association of variability in personality traits with negative affect regardless of the age of the participants.

It is important to acknowledge some limitations of our research. First, our participants were mostly healthy, well-educated European Americans. It would be desirable to include participants from diverse ethnic and socio-economic conditions in the future. Second, we were only able to examine variability across two or three occasions, and it is possible that the variability might be greater, and relations with other variables stronger, with additional occasions.

Despite some limitations, our findings that people differ in how consistent they are over time in reporting their personality are noteworthy for three reasons. First, the study involved two moderately large samples spanning a wide age range, allowing powerful analyses and fairly precise estimates of the relevant relations. Second, across-time variability, systematic change, mean trait level and negative affect were all based on latent variables that theoretically eliminate measurement errors and improve reliabilities of the measures. And third, one of the samples completed the personality inventory thrice, which allowed us to distinguish systematic trends from short-term fluctuation, to focus on the short-term fluctuation of primary interest in the current project.

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