Neuroticism and Extraversion Magnify Discrepancies between Retrospective and Concurrent Affect Reports

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Abstract

Objective: Although research often relies on retrospective affect self-reports, little is known about personality's role in retrospective reports and how these converge or deviate from affect reported in the moment. This micro-longitudinal study examines personality (neuroticism, extraversion) and emotional salience (peak, recent affect) associations with retrospective-momentary affect report discrepancies over different timeframes. **Method**: 179 adults aged 20-78 (M = 48.7 years; 73.7% Caucasian/White) each provided up to 60 concurrent affect reports over 10 days, then retrospectively reported overall intensity of each affective state after one day and again after 1-2 months. **Results**: Multilevel models revealed that individuals retrospectively overreported or underreported various affective states, exhibiting peak associations for high arousal positive and negative affect, recency associations for low arousal positive affect, and distinct personality profiles that strengthened over time. Individuals high in both extraversion and neuroticism exaggerated high arousal positive/negative affect and underreported low arousal positive affect, high extraversion/low neuroticism individuals exaggerated high arousal positive affect and underreported low arousal positive affect, and low extraversion/high neuroticism individuals exaggerated high and low arousal negative affect. **Conclusions**: This study is the first to identify arousal-specific retrospective affect report discrepancies over time and suggests retrospective reports also reflect personality differences in affective self-knowledge.

Keywords: affect, retrospective reports, self-knowledge, neuroticism, extraversion

Word count: 9,238

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Recalling affective experiences is integral to daily life – affect recall guides goal-directed behaviour, decision-making, and planning, and is also a primary source of information in much psychological research (Fredrickson, 2000; Levine, Lench, & Safer, 2009; Robinson & Clore, 2002). For instance, high arousal negative affective states like anxiety provide a crucial impetus to get out of harm's way, and their recall helps ensure the situation that elicited them (such as stepping in front of an oncoming truck) is avoided. Retrospective reports of past affect may in fact be more important than momentary reports of current affect in predicting future behavior, even if they are inaccurate (Schwarz, 2007; Wirtz, Kruger, Scollon, & Diener, 2003). Yet, little is known about how affect recall may be tied to the salience of past affective experiences and, importantly, to individual differences in general affective tendencies. Using up to 60 concurrent affect reports over a ten day period and retrospective reports obtained at two time points (1 day afterwards and 1-2 months afterwards) from adults aged 20-78 years, this study investigates how emotional salience (peak and recent affect) and personality (neuroticism and extraversion) may be linked with discrepancies between retrospective and concurrent affect reports.

Previous research comparing retrospective to concurrent affect reports indicates people tend to exaggerate the intensity of past affective experiences when retrospectively reporting how they felt over a given period (Hedges, Jandorf, & Stone, 1985; Kardum & Daskijević, 2001; Parkinson, Briner, Reynolds, & Totterdell, 1995; Thomas & Diener, 1990; Wirtz et al., 2003). This occurs for both positive affect (e.g. happy, calm) and negative affect (e.g. anxious, sad), with commonly-used retrospective affect measures (e.g. Diener & Emmons, 1984; Watson & Tellegen, 1985). Why this discrepancy? Because it is impossible to re-live felt affect, people

recreate it in an approximate way by mentally reconstructing the times when they felt a certain way, using personally meaningful information (Fredrickson, 2000; Robinson & Clore, 2002).

Emotional Salience and Retrospective-Momentary Affect Report Discrepancies

When recalling overall affective experience over the past few hours or days, retrospective affect intensity ratings tend to be biased toward emotionally salient experiences, specifically, peak affect and recent affect (Hedges et al., 1985; Kahneman, 2000; Robinson & Clore, 2002; Parkinson et al., 1995). Consider Greg, who has had a tumultuous week due to layoffs at work, but who found out at week's end that his job was safe. When asked to report the overall intensity of negative and positive affect he felt over this past week, Greg might bring to mind experiences of intense worry (peak affect) and of relief at week's end (recent affect), leading him to retrospectively exaggerate both the negative and the positive affect he felt. Peak and recent affect are emotionally salient because they carry self-relevant information about intense emotions to be coped with (peak affect: Greg fearing for his job) and about final outcomes (recent affect: Greg learning his job was safe; Fredrickson, 2000). Because of their instrumental role in planning, peak and recent affect are important for survival and health (Schwarz, 2007), and hence, their retrospective exaggeration may in fact be adaptive (Levine et al., 2009). The current study examines whether emotional salience (peak and recency associations) magnify retrospective affect intensity ratings such that they deviate from affect reports provided in the moment.

Personality and Retrospective-Momentary Affect Report Discrepancies

Time is also important in affect recall. The further one moves away from lived experience, the more one can expect to see systematic divergences between retrospective and concurrent affect reports. As affective experiences fade over time, people rely increasingly on more stable self-knowledge and heuristics to fill in the gaps when giving retrospective reports

(Robinson & Clore, 2002). For example, people who see themselves as generally anxious may inadvertently put more emphasis on anxiety when reporting past affect, as compared to those for whom anxiety is less a part of their self-schema. Beliefs about one's affective tendencies may serve to maintain a coherent self-image (Conway & Pleydell-Pearce, 2000) and have been shown to influence trait and retrospective affect reports but not concurrent reports (Robinson & Clore, 2002). Hence, in addition to emotional salience associations, general beliefs about one's affect may be linked to discrepancies between retrospective and concurrent affect reports, and the role of these beliefs may grow when one moves further in time from the lived affective experiences.

To examine links between affect recall and general beliefs about one's own affective tendencies, the present study targets two of the Big Five traits, neuroticism and extraversion (Costa & McCrae, 1989), as these are the personality traits that have been shown to map onto the basic dimensions of negative and positive affectivity (Watson & Clark, 1992). Central to neuroticism (N) is proneness to anxiety, worry, and other negative emotions (Costa & McCrae, 1989; Watson & Clark, 1992). Hence, if Greg self-identifies with attributes typical of N, he may recall more intense negative affect when thinking back to how he felt during layoffs. N has indeed been linked to retrospective exaggeration of negative affect (Barret, 1997; Mill, Realo, & Allik, 2016; Safer & Keuler, 2002). In contrast, extraversion (E), the tendency to feel energetic and sociable (Costa & McCrae, 1989; Watson & Clark, 1992), has been linked to retrospective exaggeration of positive affect (Barrett, 1997; Mill et al., 2016). The question of how affect retrospection may be tied to personality has concerned researchers for decades (Costa & McCrae, 1980; Watson & Clark, 1992). However, to our knowledge, only three studies have examined personality associations with discrepancies between retrospective and concurrent affect reports (Barrett, 1997; Mill et al., 2016; Safer & Keuler, 2002), two of which were limited to university

samples. Hence, the present study focuses on N and E as key personality factors in a lifespan community sample: it is expected that individuals high in N will exaggerate their negative affect, while individuals high in E will exaggerate their positive affect, in retrospective affect reports.

Affect Arousal Level and Retrospective-Momentary Affect Report Discrepancies

Previous research on retrospective affect discrepancies differentiates between positive and negative affect valence (e.g. PANAS; Watson & Tellegen, 1985); however, this has left out much variety in affective experience, such as being excited vs. calm. Multidimensional scaling has identified an arousal dimension that captures this variety; high arousal means feeling tense or energetic and low arousal means fatigue or stillness (Russell, 1980). Hence, the present study uses a two-dimensional affective space comprising four affect categories: high arousal positive affect, low arousal positive affect, high arousal negative affect, and low arousal negative affect.

The proposed emotional salience and personality links with retrospective affect report discrepancies may depend on the distinction between high and low arousal affect. Emotionally arousing events are stored more effectively in memory (Kensinger, 2004), which may reflect an evolutionarily-derived priority for remembering high arousal affect in response to threats or other important events. Hence, peak and recency associations with retrospective reports may be stronger for high arousal affect than for low arousal affect. Previous emotional salience findings (Hedges et al., 1985; Kahneman, 2000; Parkinson et al., 1995) have not distinguished between high and low arousal affect, leaving open the possibility that high arousal items in these studies' affect measures may be driving the associations or be playing a larger role than low arousal items. Likewise, the proposed personality links with retrospective reports may apply more to high arousal, rather than low arousal, affect. Although neuroticism (N) is associated with general negative affectivity, high arousal negative affect (e.g. anxiety) is more central to N than low

arousal affect (e.g. sadness), reflecting the high stress reactivity characteristic of N (Costa & McCrae, 1989; John, Donahue, & Kentle, 1991). Hence, high arousal negative affect may figure more prominently in how people high in N see themselves. Extraversion (E) is also tied to high arousal affect, but of a positive variety: standard measures of E assess energy and enthusiasm (Costa & McCrae, 1989; John et al., 1991). Hence, high arousal positive affect (e.g. excitement) may be more central to a person high in E than low arousal affect (e.g. calm). Previous research investigating personality associations with retrospective-momentary affect report discrepancies either examined positive and negative affect categories (Barrett, 1997; Safer & Keuler, 2002) or specific emotion items (Mill et al., 2016), but none has explicitly distinguished between high and low arousal affect. However, the way N and E are conceptualized suggests associations may be specific to high arousal affect – a possibility the current study seeks to investigate.

Time and Retrospective-Momentary Affect Report Discrepancies

Although emotional salience associations with retrospective reports are likely to fade over time as lived experiences fade (Robinson & Clore, 2002), the time course of personality associations is less clear. Most previous work on emotional salience and personality associations captured only one retrospective report per participant (Barrett, 1997; Hedges et al., 1985; Kahneman, 2000; Parkinson et al., 1995; Safer & Keuler, 2002) and hence could not address change over time, with the exception of one study that involved repeated daily life assessments over a relatively short period of 14 days (Mill et al., 2016). The current study expands on previous work by investigating how emotional salience (peak and recency) and personality (N and E) might be tied to discrepancies between retrospective and concurrent affect reports, and how these associations might change as the period over which people recall their affect lengthens from several days to several weeks. It is expected that for timeframes of several days (when

experiences are fresh), emotional salience associations will be relatively strong, but that they will be diminished for a recall period of several weeks or longer. Personality associations, in contrast, are expected to be stronger for the longer recall period as compared to the shorter period because as time passes, individuals may come to draw more on general self-knowledge to compensate for fading memory of specific affective experiences (Robinson & Clore, 2002).

The specific aim of the present study was to examine how personality (neuroticism and extraversion) and emotional salience (peak and recent affect) might be tied to retrospective-momentary affect report discrepancies over different timeframes. 179 adults aged 20-78 years each provided up to six concurrent affect reports each day for a 10-day period using handheld devices, and provided retrospective reports of overall affect intensity approximately one day later and again approximately 1-2 months later. Retrospective affect discrepancies indicate the extent to which participants' ratings of overall felt affect deviate from their averaged in-the-moment affect reports. Hypotheses are as follows: (1) Peak momentary affect will be associated with retrospective overreporting of high arousal positive and negative affect and the strength of these associations will be greater for reports given after one day compared to reports given after 1-2 months; (2) Recent momentary affect will also be associated with retrospective overreporting of high arousal positive and negative affect, and more so at the earlier retrospective reporting time; (3) Neuroticism will be associated with retrospective exaggeration of high arousal negative affect, and the strength of this association will be greater for reports given after 1-2 months compared to those given after one day; and (4) Extraversion will be associated with retrospective exaggeration of high arousal positive affect, and more so at the later retrospective report time. No emotional salience or personality associations are expected for low arousal affect reports.

This study also controls for age, gender, ethnicity, education, and cognitive abilities in

the retrospective-momentary affect report discrepancy models. These control variables were selected based on previous research demonstrating that older adults selectively recall more positive and less negative affective experiences (Grühn, Scheibe, & Baltes, 2007; Mather & Carstensen, 2005; Ready, Weinberger, & Jones, 2007); that gender-based self-schemas can shape reported emotional intensity (Robinson, Johnson, & Shields, 1998); that there are cultural differences in the value placed on different kinds of affect (Tsai, Knutson, & Fung, 2006); and that education, verbal knowledge, and inductive reasoning may all help individuals accurately distinguish and report on their affect (Ekstrom, French, Harman, & Derman, 1976).

Method

Participants

The sample was 179 adults (*M* age = 48.7 years, *SD* = 18.9; 37.4% aged 20-39, 28.5% aged 40-59; 34.1% aged 60-78) living in Atlanta and the surrounding area. Recruitment was done through an existing participant database, participant referral, and postcards sent to potential participant contacts purchased from an ad agency. The sample was stratified by age and employment status to encompass a range of socioeconomic backgrounds, with university student participation limited to 26% for the young adult group. The final sample was 50.8% female, 73.7% Caucasian/White, 19.6% African-American/Black, 2.2% Asian, and well educated (86.0% with at least some college/university education). An additional 10 participants were excluded due to personal circumstances (death in family, recent surgery, shift work, frequent work absence), psychotropic medication use, mental illness (panic/anxiety attacks, PTSD, mood disorders), misunderstanding of procedures, or substantial missing data. A further 11 participants were excluded due to missing data on key personality measures. Participants who completed the study were compensated USD 100, and those who completed only certain portions were compensated

USD 10 to USD 30 depending on extent of completion. The study was approved by the Georgia Institute of Technology Research Ethics Board. For more information on sample and procedures, see Scott, Sliwinski, and Blanchard-Fields (2013).

Procedure

Participants completed a mail-out package containing personality and other individual difference measures, and then an in-lab session, which included cognitive testing and training on the use of the handheld devices for the study. Next, for a 10-day period, participants completed six daily questionnaires assessing current affect and other behavioural and hormonal measures not used in the present analyses. Each day, participants completed the first questionnaire upon awakening and were then beeped at regular intervals to complete five additional questionnaires using a handheld device (Tungsten T). After the time-sampling phase, participants provided study feedback and returned their handheld devices. Participants generally reported that their days in study were typical of their everyday lives (M = 4.2 on a 5-point scale). In the exit session, participants were asked to recall how they had felt since the beginning of the study (including the time-sampling period); the same affect items used in the time-sampling phase were re-administered to obtain these exit retrospective affect reports. One month later, participants were mailed a follow-up questionnaire package containing individual difference measures and were asked once again (using the same set of affect items) how they had felt since the beginning of the study, which included the time-sampling period and the intervening time between the time-sampling phase and the follow-up report. Participants mailed their completed questionnaires back to the lab; of the 179 participants, 143 (80%) completed the follow-up package, and the remaining 36 participants completed the exit session only. Participants who completed the follow-up differed from those who did not do the follow-up in that they were older (M = 51.1 vs.

39.4 years of age, $p < .001$) and more likely to identify as Caucasian/White (78.3% vs. 55.6% Caucasian, $p < 0.01$). Hence, age and ethnicity are included as covariates in analyses. All 179 participants who provided at least one retrospective affect report are included in analyses. One participant's exit session reports were excluded due to a suspected recording error (the exit session date was recorded as being before the end of the participant's time-sampling period).

Measures

Momentary Affect Ratings. At each assessment, participants indicated the extent to which they were currently experiencing each of eight affective states on a 5-point scale (1 = "not at all", 5 = "very much"). Items captured affective states of high and low arousal and of positive and negative valence, and were selected based on previous work demonstrating their usefulness in cross-cultural lifespan samples (Magai, Consedine, Krivoshekova, Kudadjie-Gyamfi, & McPherson, 2006; Tsai et al., 2006). Items represent each of four combinations of arousal and valence: high arousal positive affect (happy, excited; item intercorrelation $r = 0.43$, $p < .01$), low arousal positive affect (quiet, calm; $r = 0.36$, $p < .01$), high arousal negative affect (nervous, irritated; $r = 0.43$, $p < .01$), low arousal negative affect (sad, sleepy; $r = .18$, $p < .01$). Four affect scales were created by averaging the two items in each category. Scale means were: high arousal positive affect ($M = 3.07$, $SD = 0.60$), low arousal positive affect ($M = 3.64$, $SD = 0.52$), high arousal negative affect ($M = 1.61$, $SD = 0.52$), low arousal negative affect ($M = 1.85$, $SD = 0.48$).

Participants each provided up to 60 affect reports over 10-day period, for a total of 9973 momentary ratings of each affect item. Three variables were derived from momentary affect ratings: (1) average momentary affect (used as a control), and emotionally salient experiences operationally defined as (2) peak momentary affect and (3) recent momentary affect. ***Average Momentary Affect.*** For each of the four momentary affect scales (high arousal positive affect,

low arousal positive affect, high arousal negative affect, low arousal negative affect), each participant's average over the 10-day time-sampling period was computed. ***Peak Momentary Affect.*** For each momentary affect scale, the maximum (peak) value over the time-sampling period was obtained for each participant. This was done to capture instances of high intensity affect, given that individual episodes of peak affect are likely to be emotionally salient. ***Recent Momentary Affect.*** For each affect scale, a measure of recent affect was obtained by averaging the participant's most recent scale ratings – their ratings from the last day of the time-sampling period. Participants typically completed the full six affect ratings on the last day, but some only completed five ratings. This last-day average was taken instead of using a single rating (the very last momentary affect report) to account for time of day influences on momentary ratings.

Retrospective Affect Ratings. Participants retrospectively reported their affect once at the exit session, which took place 0-4 days (M = 1.1 days, SD = 0.7) after the last day of the time-sampling phase, and again in a follow-up mail-out package, completed an average of 46.3 days (SD = 18.3) post time-sampling. Follow-up package completion dates ranged from 26 to 117 days post-time-sampling and were treated as one follow-up cluster of reports covering a relatively long recall period (several weeks to months), whereas the exit report cluster covered a much shorter period (several days). The same 8 affect items used in the time-sampling measures were re-administered; for each, participants indicated the extent to which they had felt that way since the beginning of the study (1 = "not at all" to 5 = "very much"). Hence, retrospective reports effectively included both the time-sampling period and the intervening time between the time-sampling phase and the retrospective reporting time. Items were again combined into four scales: high arousal positive affect (happy, excited; item intercorrelation r = 0.42, p < .01), low arousal positive affect (quiet, calm; r = 0.31, p < .01), high arousal negative affect (nervous,

irritated; $r = 0.34$, $p < .01$), and low arousal negative affect (sad, sleepy; $r = .15$, $p = .08$). Scale means were: high arousal positive affect (exit report $M = 3.34$, $SD = 0.77$; follow-up report $M = 3.38$, $SD = 0.74$), low arousal positive affect (exit $M = 3.47$, $SD = 0.79$; follow-up $M = 3.35$, $SD = 0.68$), high arousal negative affect (exit $M = 1.73$, $SD = 0.71$; follow-up $M = 1.85$, $SD = 0.70$), low arousal negative affect (exit $M = 1.86$, $SD = 0.63$; follow-up $M = 1.97$, $SD = 0.68$).

Retrospective Affect Report Discrepancies. For each retrospective report of high arousal positive affect, low arousal positive affect, high arousal negative affect, and low arousal affect (calculated from participants' retrospective ratings at exit and follow-up), retrospective report discrepancies were computed as the participant's retrospective report minus their corresponding average momentary affect report. Positive retrospective discrepancies indicate that a participant retrospectively exaggerated how they felt relative to their momentary reports, whereas negative retrospective discrepancies point to underestimation of felt affect. A value of 0 for retrospective report discrepancy indicates that retrospective ratings match momentary affect reports exactly. Mean retrospective discrepancies were: high arousal positive affect discrepancy (exit report $M = 0.26$, $SD = 0.60$; follow-up report $M = 0.34$, $SD = 0.62$), low arousal positive affect discrepancy (exit $M = -0.16$, $SD = 0.59$; follow-up $M = -0.30$, $SD = 0.59$), high arousal negative affect discrepancy (exit $M = 0.12$, $SD = 0.57$; follow-up $M = 0.25$, $SD = 0.69$), low arousal negative affect discrepancy (exit $M = 0.01$, $SD = 0.54$; follow-up $M = 0.15$, $SD = 0.60$).

Personality Traits. Neuroticism (N) and Extraversion (E) were measured in the first mail-out package using 16 items (8 items per trait) from a 44-item version of the Big Five Inventory (John et al., 1991). Participants rated items on a 5-point scale (1 = "disagree strongly" to 5 = "agree strongly"), and scale means were: N ($M = 2.25$, $SD = 0.74$), E ($M = 3.17$, $SD = 0.77$). Cronbach's alphas were 0.84 for the N scale and 0.85 for E.

Covariates. Models also included age, gender, ethnicity (Caucasian vs. non-Caucasian), education level, and Advanced Vocabulary (verbal knowledge) and Letter Sets (inductive reasoning) test scores, with higher scores indicating better performance (Ekstrom et al., 1976).

Statistical Analysis

Multilevel modeling was used given the hierarchical data structure (retrospective reports nested within participants). Analyses were conducted using the lme4 package in *R* (Bates et al. 2015). Retrospective report time (coded 0 = exit, 1 = follow-up) was added as a Level 1 predictor. Level 2 (person level) predictors examined emotional salience (peak and recent affect) and personality (N and E) associations. Four cross-level interaction terms were added to model differences between exit and follow-up for recent affect, peak affect, N, and E. Models included age, gender, ethnicity, education, advanced vocabulary and letter sets scores, and average momentary affect as Level 2 covariates. 322 measurement points (179 exit reports + 143 follow-up reports) were included in analyses at Level 1 and 179 participants were included at Level 2.

Results

Overview of Analyses and Descriptive Statistics

Multilevel models predicted retrospective affect report discrepancies (differences between retrospective affect reports given one day or 1-2 months after the time-sampling period and average momentary affect reported during the time-sampling period), and how these differ from one retrospective report time to the next, based on specified emotional salience and personality predictors. Separate models were examined for high arousal positive affect, low arousal positive affect, high arousal negative affect, and low arousal negative affect. *Table 1* presents descriptive statistics and zero-order intercorrelations for the key study variables. In line with established links between neuroticism and negative affectivity, higher neuroticism was

associated with significantly lower average momentary high arousal positive affect, and with higher average momentary high arousal and low arousal negative affect. These associations underscore the need to account for the role of average momentary affect in this study.

Unspecified (empty) models predicting retrospective affect report discrepancies revealed that at the exit session, participants retrospectively overreported their high arousal positive affect (report discrepancy b = 0.26, SE = 0.05, 95% CI [0.17, 0.35]) and high arousal negative affect (b = 0.12, SE = 0.05, 95% CI [0.03, 0.22]). Participants underreported their low arousal positive affect (b = -0.16, SE = 0.04, 95% CI [-0.25, -0.07]) and accurately reported their low arousal negative affect (b = 0.01, SE = 0.04, 95% CI [-0.07, 0.09]) at exit.

Peak and Recent Affect Associations with Retrospective Affect Discrepancies

To investigate emotional salience associations with retrospective affect report discrepancies, models examined peak and recent affect and their interactions with retrospective report time (exit vs. follow-up). Results are presented in *Table 2*. In line with Hypothesis 1, higher peak affect was associated with greater overreporting of high arousal positive affect (b = 0.24*)* and high arousal negative affect (b = 0.18) at exit, and there were no associations with low arousal positive affect or low arousal negative affect. However, hypothesized interactions between peak affect and retrospective report time were not supported. Hence, participants' retrospective reports of high (but not low) arousal affect were exaggerated in the direction of peak momentary experiences of high arousal positive and negative affect, and this exaggeration was no different after 1-2 months. Hypothesis 2 (pertaining to recent affect) was also not supported, as recent affect was not associated with retrospective report discrepancies for high arousal positive and negative affect at exit. However, higher recent momentary affect was associated with greater overreporting of low arousal positive affect at exit (b = 0.37). From exit

to follow-up, the association between recent affect and retrospective report discrepancies decreased for low arousal positive affect (b = -0.36) and high arousal negative affect (b = -0.34). Hence, retrospective low arousal positive affect reports were exaggerated in the direction of recent momentary affect experiences, and this exaggeration decreased from exit to follow-up. Although recent high arousal negative affect experiences were not associated with retrospective report discrepancies at exit, higher recent high arousal negative affect became more strongly associated with retrospective underreporting of this affective state from exit to follow-up.

Neuroticism and Extraversion Associations with Retrospective Affect Discrepancies

Neuroticism (N) and extraversion (E) and their interactions with retrospective report time (exit vs. follow-up) were examined to test hypotheses pertaining to personality associations with retrospective affect report discrepancies. Hypothesis 3 (pertaining to N) was partially supported as N was associated with retrospective overreporting of high arousal negative affect at exit (b = 0.02). N was also associated with retrospective underreporting of low arousal positive affect at exit (b = -0.02). In line with Hypothesis 4, E was associated with retrospective overreporting of high arousal positive affect at exit (b = 0.02), but this association diminished from exit to follow-up (b = -0.02). Furthermore, E was found to be associated with retrospective underreporting of low arousal positive affect at exit (b = -0.02) and with a decrease in retrospective overreporting of low arousal negative affect from exit to follow-up (b = -0.02). Hence, individuals high in N retrospectively exaggerated their high arousal negative affect and downplayed their low arousal positive affect, whereas individuals high in E retrospectively exaggerated high arousal positive affect and underreported low arousal positive affect. Counter to expectations, these personality associations with retrospective report discrepancies were no greater at follow-up than at exit.

Most participants gave two retrospective affect reports (at exit and at follow-up), but 36

participants gave only one report (at exit), and hence their data were excluded from retrospective report time slope computations in the multilevel models. As a result, the models' power was limited for detecting hypothesized interactions between personality predictors and retrospective report time. Because a key focus of this study is whether N and E associations with retrospective affect discrepancies might differ from exit to follow-up, these associations were broken down into simple slopes that were then tested individually, enabling their investigation with less power constraints. Rather than treating N and E in isolation from one another, this approach also reveals how retrospective affect is tied to various combinations of these personality traits. Associations between retrospective affect discrepancies and report time were analyzed for four different personality profiles: (1) high N/high E, (2) high N/low E, (3) low N/high E, and (4) low N/low E. The high N/high E profile, for example, was defined as having an N score of one SD above the sample mean for N and an E score of one SD below the sample mean for E. To supplement the broader personality associations reported (*Table 2*), results for these four distinct personality profiles are presented in *Figure 1*. This figure shows retrospective report discrepancies at exit and follow-up (model intercepts), and differences from exit to follow-up (model slopes).

Overall, there are distinct personality-specific patterns in retrospective affect report discrepancies; the paragraph that follows provides statistical details of these patterns. Individuals high in both neuroticism (N) and extraversion (E) retrospectively overreported high arousal positive and negative affect and underreported low arousal positive affect at exit, and these discrepancies persisted at follow-up for high arousal negative affect and low arousal positive affect only. In contrast, those high in N but low in E retrospectively overreported high arousal negative affect at exit, and by follow-up, they were overreporting both high and low arousal negative affect; increases in retrospective overreporting from exit to follow-up were significant

for both high and low arousal negative affect. Individuals low in N but high in E retrospectively exaggerated high arousal positive affect at both exit and follow-up and underreported low arousal positive affect at follow-up. Finally, individuals low in both N and E accurately reported their past affect at exit but retrospectively exaggerated high arousal positive affect and low arousal negative affect at follow-up, exhibiting significant increases in retrospective report discrepancies from exit to follow-up for both kinds of affect.

Figure 1a shows that individuals high in E, regardless of N score, retrospectively exaggerated high arousal positive affect at exit (high N: 0.25, *SE* = 0.10, 95% CI [0.05, 0.46]; low N: 0.23, *SE* = 0.10, 95% CI [0.04, 0.42]) and individuals low in N, regardless of E score, overreported high arousal positive affect at follow-up (high E: 0.25, *SE* = 0.11, 95% CI [0.04, 0.46]; low E: 0.21, *SE* = 0.11, 95% CI [0.00, 0.42]). For individuals scoring low in both N and E, retrospective overreporting of high arousal positive affect increased from exit to follow-up (*b* = 0.28, *SE* = 0.10, 95% CI [0.08, 0.48], *d* = 0.60). Turning to *Figure 1b*, individuals high in both E and N retrospectively underreported low arousal positive affect at exit (-0.27, *SE* = 0.11, 95% CI [-0.48, -0.06]), and those high in E, regardless of N score, retrospectively underreported low arousal positive affect at follow-up (high N: -0.46, *SE* = 0.11, 95% CI [-0.68, -0.24]; low N: -0.23, *SE* = 0.10, 95% CI [-0.44, -0.02]). No retrospective report time differences emerged for low arousal positive affect for any of the personality combinations. *Figure 1c* reveals individuals high in N, regardless of E score, overreported high arousal negative affect at both exit (high E: 0.27, *SE* = 0.11, 95% CI [0.06, 0.48]; low E: 0.28, *SE* = 0.09, 95% CI [0.09, 0.46]) and follow-up (high E: 0.43, *SE* = 0.12, 95% CI [0.20, 0.67]; low E: 0.57, *SE* = 0.10, 95% CI [0.37, 0.73]). This retrospective overreporting increased from exit to follow-up for individuals high in N and low in E (*b* = 0.29, *SE* = 0.09, 95% CI [0.12, 0.46], *d* = 0.59). Finally, as seen in *Figure 1d*, individuals

low in E, regardless of N score, overreported low arousal negative affect at follow-up only (high N: 0.43, *SE* = 0.09, 95% CI [0.24, 0.61]; low N: 0.22, *SE* = 0.11, 95% CI [0.01, 0.42]) and this retrospective overreporting increased from exit to follow-up (high N: *b* = 0.26, *SE* = 0.08, 95% CI [0.10, 0.42], *d* = 0.60; low N: *b* = 0.22, *SE* = 0.10, 95% CI [0.03, 0.41], *d* = 0.50). Reported slope effect sizes are approximations of Cohen's *d* for multilevel models.

Additional Relationships and Model Fit

Average momentary affect, age, gender, ethnicity, education, advanced vocabulary score, and letter sets score were included as covariates in study models (*Table 2*). For each of the four affect categories, individuals whose average momentary affect was higher had a greater tendency to underreport this type of affect at exit. Older age was associated with less overreporting of high arousal negative affect (*b* = -0.01) and low arousal negative affect (*b* = -0.01), higher advanced vocabulary score with less overreporting of high arousal positive affect (*b* = -0.03), and higher letter sets score with less overreporting of low arousal negative affect (*b* = -0.04) at exit. Caucasian individuals overreported high arousal positive affect more than non-Caucasian individuals (*b* = 0.23) at exit. Finally, some overall retrospective affect report discrepancies remained that were unaccounted for by study models. Participants tended to overreport their high arousal negative affect at exit (*b* = 0.17). From exit to follow-up, there was a general shift toward greater underreporting of low arousal positive affect (*b* = -0.13) and greater overreporting of high arousal negative affect (*b* = 0.12) and low arousal negative affect (*b* = 0.14).

Model intraclass correlations range from 0.27 to 0.43, indicating a substantial proportion of variance is at the person level. Model fit was assessed by examining reductions in deviance for each of the four models compared to unspecified (empty) models. Significant reductions in deviance were obtained with all models. Model fit indicator details are presented in *Table 2*.

Discussion

This study examined how emotional salience and personality are tied to discrepancies between retrospective and concurrent affect reports, and how these associations differ depending on retrospective report timing. Participants provided momentary affect reports over a 10-day time-sampling period, and then retrospective affect reports about 1 day after the time-sampling period (exit session) and again after 1-2 months (follow-up mail-in package). Multilevel models examined emotional salience (peak and recent affect) and personality (neuroticism, extraversion) associations with retrospective report discrepancies for high arousal positive affect, high arousal negative affect, low arousal positive affect, and low arousal negative affect.

Overall (in unspecified models that did not account for emotional salience and personality associations), individuals overreported their high arousal positive and negative affect and underreported their low arousal positive affect in retrospective as compared to average momentary reports. In line with Hypothesis 1, higher peak momentary high arousal positive and negative affect were associated with greater retrospective overreporting of these affective states at exit, but the expected diminishment of these ties from exit to follow-up was not found. Hypothesized associations between recent affect and retrospective discrepancies in high arousal positive and negative affect reports (Hypothesis 2) were not found. However, recent low arousal positive affect was associated with overreporting this affective state at exit, and this association decreased from exit to follow-up. The association between recent high arousal negative affect and retrospective overreporting of this affective state also diminished from exit to follow-up. In line with Hypothesis 3, neuroticism (N) was tied to retrospective exaggeration of high arousal negative affect at exit, but this association was not significantly stronger at follow-up. N was also associated with retrospective underreporting of low arousal positive affect at exit. Finally, the

predicted link between extraversion (E) and retrospective exaggeration of high arousal positive affect (Hypothesis 4) was found at exit, but this association was diminished at follow-up. E was also associated with retrospective underreporting of low arousal positive affect at exit, and with a decrease in retrospective overreporting of low arousal negative affect from exit to follow-up. To better understand these broad personality associations, they were broken down into retrospective affect discrepancies at exit and follow-up for individuals with (1) high N and high E, (2) high N and low E, (3) low N and high E, and (4) low N and low E. Emotional salience associations with retrospective report discrepancies are discussed first, followed by personality associations.

Peak and Recent Affect Associations with Retrospective Affect Discrepancies

Higher peak affect was associated with greater retrospective overreporting of high arousal affect, both positive and negative, but not of low arousal affect. This study thus extends previous research on peak affect influences, which had not distinguished between high and low arousal affect (Fredrickson, 2000; Hedges et al., 1985; Kahneman, 2000; Parkinson et al., 1995). For high and low arousal positive affect, most participants' peaks fell at the upper end of the 5-point scale, which is typical of healthy adults. Still, findings should be replicated in a sample whose peak affect covers the full scale range. Peak affect associations did not diminish from exit to follow-up as predicted; however, this may be because each participant reported multiple peaks for each type of affect over the time-sampling period. If peak affect is continually reinforced through repeated experiences, its ties with retrospective reports may not fade over the long term.

Predicted associations between recent high arousal positive and negative affect and retrospective exaggeration of these affective states were not supported. It may be that peak affect trumps recent affect associations with retrospective reports, and hence, recency associations are not always detectable in models that include both. This is in line with much of the literature on

peak and recent affect influences on retrospective report discrepancies, which has found that recency effects are relatively weak and, in some cases, undetectable (Fredrickson, 2000; Hedges et al., 1985). It is also possible that operationalizing recent affect as the last-day average instead of as the single last affect rating took away from the salience of recent affective experiences captured in this study. Interestingly, however, recent low arousal positive affect was associated with exaggerated retrospective reports, an association that diminished from exit to follow-up. It seems recent low arousal positive affect may be particularly memorable, at least for a few days.

Emotionally salient experiences (e.g. peak high arousal negative affect due to layoff threats) are reinforced in memory for good reason, and this study's findings underscore the need to account for their potential role in affect recall. People's judgments of how they felt over a given period need to be interpreted carefully, in research and in life.

Neuroticism and Extraversion Associations with Retrospective Affect Discrepancies

This study affirms previous research linking neuroticism (N) with negative affect exaggeration and extraversion (E) with positive affect exaggeration in retrospective reports (Barrett, 1997; Mill et al., 2016; Safer & Keuler, 2002), and further reveals these associations are specific to high arousal negative/positive affect, rather than low arousal affect. Findings show links between personality-related self-knowledge and affect recall, and reasonably so given that propensity for high arousal negative affect (e.g. anxiety, worry) is central to N, whereas E is strongly linked with high arousal positive affect (e.g. happiness, high energy; Costa & McCrae, 1989; Watson & Clark, 1992). Exploratory analyses revealed these personality links tended to be stronger when individuals were retrospecting over a longer period (several weeks vs. several days), suggesting that individuals were making greater use of personality-related self-knowledge to compensate for fading memory of emotional experiences (Robinson & Clore, 2002).

Specifically, in line with predictions, individuals high in N retrospectively exaggerated high arousal negative affect at both report times, though initial analyses did not show differences from exit to follow-up. Interestingly, in follow-up analyses looking at different combinations of N and E, individuals who were both high in N and low in E showed a stronger pattern of retrospectively overreporting negative affect. In addition to high arousal negative affect, these individuals also exaggerated their low arousal negative affect at follow-up, and their exaggeration of both types of negative affect increased from exit to follow-up. It may be that individuals who are low E see themselves as even more prone to negative affectivity, perhaps because being low E also means having less energy and enthusiasm (Watson & Clark, 1992). Indeed, these exploratory analyses found low E was associated with greater retrospective overreporting of low arousal negative affect at follow-up, even for individuals high in N. Findings linking low E with retrospective exaggeration of both high and low arousal negative affect dovetail with previous research revealing a negative association between E and retrospective exaggeration of fear and sadness over a two-week period (Mill et al., 2016).

Hypotheses pertaining to E were partially supported in that individuals high in E overreported their high arousal positive affect at exit. Although it appeared in initial analyses that this association was diminished at follow-up, subsequent exploratory analyses revealed an association at follow-up, but only for individuals who were also low in N. It seems that low N is a key trait linked with exaggerating high arousal positive affect over the longer term; indeed, individuals low in N retrospectively overreported their high arousal positive affect at follow-up, regardless of their level of E. It may be that being low in N, and hence less prone to negative affect in general (Watson & Clark, 1992), means these individuals see their affective tendencies in a more positive light retrospectively and as part of general self-schemas. This interpretation is

also in line with previous research showing a negative association between N and retrospective exaggeration of happiness (Mill et al., 2016). Individuals who were high in E also tended to retrospectively underreport low arousal positive affect, an association that increased overall from exit to follow-up. Exploratory analyses also showed this association at follow-up regardless of individuals' level of N. High E individuals tend to be talkative and energetic (Costa & McCrae, 1989), hence, it may be that their memory for times when they were calm and quiet is not very pronounced, especially when drawing on self-knowledge to recall affect over a longer period.

This study links different personality profiles with distinct retrospective affect report discrepancy patterns, showing how the interplay of N and E is tied to affect recall. Findings extend the literature linking personality with retrospective-concurrent affect report discrepancies (Barrett, 1997; Mill et al., 2016; Safer & Keuler, 2002) by going beyond valence-based models of affect to show how report discrepancies are also tied to the arousal dimension of affect (Russell, 1980). This study's use of two retrospective report times in multilevel models also extends previous work that looked only at one-time retrospective affect ratings or relatively short recall periods (Barrett, 1997; Mill et al., 2016; Robinson & Clore, 2002; Safer & Keuler, 2002).

Reflecting on past affective experiences is important for knowing oneself and making sense of one's life (Thomas & Diener, 1990). Not only is personality-related self-knowledge used to fill affective memory gaps, but individuals may also pull information from their affective experiences to understand their own personalities. Thus, habitual biases in how people remember affective experiences might serve to create and reinforce self-schemas, which, in turn, shape responses on personality self-reports (Safer & Keuler, 2002). Affective experiences and self-knowledge seem to mutually reinforce one another. Hence, although the current findings are interpreted as personality influences on retrospective affect reports, they could also be

interpreted as capturing a snapshot of a cyclical process, rather than a unidirectional relationship.

Another explanation for these findings invokes personality differences in emotional processing. People high in N are more likely to retrieve negative memories, whereas those high in E have a bias toward positive memory retrieval, and these personality influences interact with current affect to create memory discrepancies (Rusting, 1998). A potential mechanism involves behavioural approach/inhibition: people high in E may be more attentive to positive affect, which motivates approach behaviour, while those high in N may be more attentive to negative affect, which motivates avoidance (Gray, 1981). Future work should include measures of behavioural approach/inhibition and current affect (during retrospection) to investigate these possibilities.

Some have argued that affect is not directly stored in memory - that we access beliefs about affect rather than affect itself (Wyer, Clore, & Isbell, 1999), calling into question whether it is in fact possible to give accurate retrospective reports of felt affect. This study's findings suggest certain people may exaggerate or downplay certain types of affect when reporting how they felt over a given period. Hence, in research and in daily life, we need to be mindful of personality and other potential sources of retrospective affect report discrepancies when asking people to tell us how they have felt. Personality-congruent discrepancies between retrospective and concurrent affect reports are not necessarily a bad thing. Retrospective reports shaped by personality are useful in that they can reveal a lot about a person's belief structures; arguably, they reveal more about a person than concurrent affect reports (Robinson & Clore, 2002).

Age and Other Covariates' Associations with Retrospective Affect Report Discrepancies

Gender, ethnicity, education, two cognitive performance measures, and age were included as control variables in study models. Although gender may be a source of affect-related self-schemas shaping affect recall (Robinson et al., 1998), no gender differences in retrospective

affect report discrepancies were found. Individuals identifying as Caucasian overreported their high arousal positive affect more than non-Caucasian individuals; this may reflect cultural differences in affect valuation (Tsai et al., 2006). Higher scores on the advanced vocabulary and letter sets tests were associated with less retrospective overreporting of high arousal positive affect and low arousal negative affect, respectively. Hence, verbal knowledge and inductive reasoning do seem to enable greater accuracy in retrospectively reporting certain kinds of affect.

A key strength of this study is its use of a lifespan community sample (age 20-78 years), enabling comparisons across age-heterogenous groups. Greater age was associated with less retrospective overreporting of high and low arousal negative affect, and no associations were found for positive affect. These findings align with previous research on memory for emotionally valenced stimuli, which demonstrated a reduced negativity bias in old age (Grühn et al., 2007). Findings also concord with conceptual models positing that older adults aim to reduce their negative affect (Mather & Carstensen, 2005). Previous findings linking older age with less retrospective underreporting of felt positive affect (Ready et al., 2007) were not replicated. This may be attributable to the present study's distinction between high arousal positive affect, which is retrospectively overreported across the lifespan, and low arousal positive affect, which tends to be underreported - underscoring the need to consider the affect arousal dimension in this research. Still, older adults give quite accurate retrospective affect reports compared to their younger counterparts (Röcke, Hoppmann, & Klumb, 2011), a testament to how well-maintained emotional memory systems are in late life. Overall, despite the report discrepancies described here, people's retrospective reports of felt affect are quite accurate (Kardum & Daskijević, 2001).

Limitations and Future Directions

This study examined emotional salience and personality links with retrospective-

momentary affect report discrepancies at different retrospective report times. After a 10-day momentary affect assessment period, participants retrospectively reported felt intensity of different affective states since the beginning of the study – once at an exit session about one day after the end of the momentary assessment period, and again through a mail-in follow-up package completed 1-2 months later. Because momentary affect reports were only collected over a 10-day period, whereas participants were asked to recall their affect since the beginning of the study (regardless of how long it had been since the momentary assessment period), retrospective reports provided at follow-up cover both more time and a greater portion of experience that was not captured in momentary reports. Hence, differences between exit and follow-up retrospective report discrepancies may also be ascribed to a) differences in time delay between the momentary assessment period and the retrospective report, b) differences in the length of the period over which participants were asked to retrospect, or c) differences in the proportion of this reporting period that was captured by momentary affect reports. Participants did indicate that the momentary assessment period was typical of their everyday lives (4.2 on a 5-point scale). Hence, the momentary reports captured during this period can be assumed to be representative of their typical affective experiences. Still, follow-up research investigating retrospective affect report discrepancies should aim to disentangle elapsed time from retrospective reporting period length and examine the potential influence of affective experiences not captured by momentary reports.

Participants' average high and low arousal negative affect scores were highly correlated (r = 0.71). This may have resulted from participants' relatively low endorsement of negative affective items, in line with the extant literature on community-dwelling samples (Magai et al., 2006; Tsai et al., 2006). Still, it is useful to conceptually distinguish between high and low arousal negative affect, and future research should take care to select negative affect items with

adequate distributional properties in diverse samples. Finally, 20 percent of the sample was lost to attrition between exit and follow-up, with attrition biased toward participants who were younger and not Caucasian/White. This limits the generalizability of the reported findings.

Conclusions

How do we make sense of our affective experiences? Salient memories of intense or recent experiences serve as guides – helping us decide which to pursue and which to avoid in the future. This study suggests that peak intensity experiences of high arousal positive and negative affect magnify retrospective affect reports, and that recent low arousal positive affect magnifies retrospective affect. Personality (neuroticism and extraversion) may also play a key role in filling memory gaps by helping us reconstruct our affective experiences based on broader conceptions of who we are. This study links specific personality profiles with distinct retrospective affect report discrepancy patterns: high N/high E with exaggerating high arousal positive and negative affect and underreporting low arousal positive affect, high N/low E with exaggerating high and low arousal negative affect and even more so over the longer term, and low N/high E with exaggerating high arousal positive affect and underreporting low arousal positive affect. To extend these findings, research should incorporate other potential sources of report discrepancies, such as approach/avoidance motivation and mood during retrospection (Levine et al., 2009; Parkinson et al., 1995). Discrepancies between retrospective and momentary affect reports are not necessarily a problem – retrospective affect better reflects self-knowledge and better predicts future choices than affect reported in the moment (Schwarz, 2007; Wirtz et al., 2003). Overall, there are good reasons for exaggerating or downplaying certain affective experiences in memory and for studying these processes. Paying attention to emotionally meaningful experiences that align with one's identity is crucial to navigating a complex emotional world.

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Tables

Table 1

Means and Standard Deviations of Central Predictor Variables and Variable Intercorrelations (N = 179 participants)

	Mean (*SD*)	1	2	3	4	5	6	7	8	9	10	11	12
1. Gender	51% female		0.00	-0.08	-0.08	-0.05	0.12	0.07	0.18*	-0.12	-0.11	0.08	0.12
2. Age	48.75 *(18.96)*			0.13	-0.12	0.14	-0.49**	-0.20	0.01	0.06	0.29*	-0.24	-0.42**
3. Ethnicity	74% Caucasian				0.14	0.28*	0.12	-0.05	0.08	-0.01	-0.03	0.00	-0.05
4. Education	7.22 *(1.90)*					0.27**	0.22**	0.05	0.03	-0.12	-0.05	0.07	0.01
5. Advanced vocabulary	10.81 *(3.24)*						0.26	-0.10	-0.15	-0.10	0.10	-0.05	-0.02
6. Letter sets	10.31 *(2.80)*							0.08	-0.06	0.05	-0.07	0.06	0.16
7. Neuroticism	2.25 *(0.74)*								-0.20	-0.34**	-0.26	0.42**	0.35**
8. Extraversion	3.17 *(0.77)*									0.22	-0.15	0.00	-0.07
9. Average HAPA	3.07 *(0.60)*										0.14	-0.15	-0.27*
10. Average LAPA	3.64 *(0.52)*											-0.39**	-0.31*
11. Average HANA	1.61 *(0.52)*												0.71**
12. Average LANA	1.85 *(0.48)*												

Note. HAPA = high arousal positive affect; LAPA = low arousal positive affect; HANA = high arousal negative affect; LANA = low arousal negative affect. Gender coded as 1 = female, 0 = male; ethnicity coded as 0 = non-Caucasian, 1 = Caucasian; education ranges from 1 (less than 12 years) to 11 (J.D./M.D.Ph.D.). Advanced Vocabulary and Letter Sets scores are out of 18 and 15, respectively; and all other variables are scored on 5-point Likert scales.
* $p < .05$, ** $p < .01$

Table 2

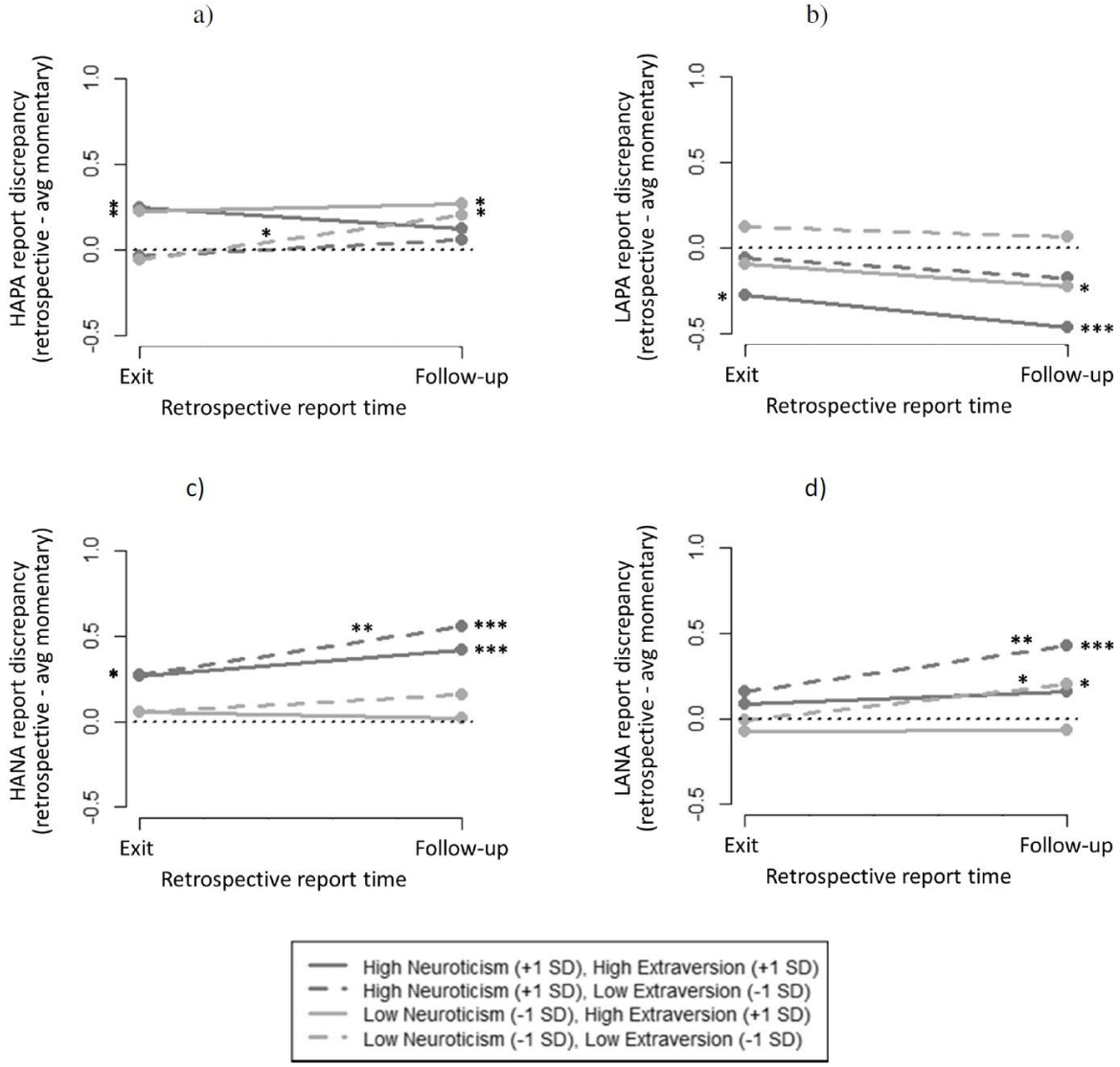
Hierarchical Linear Models Predicting Retrospective-Momentary Affect Report Discrepancies from Report Time, Emotional Salience, and Personality Using Full Maximum Likelihood Estimation (N = 322; 179 retrospective reports at exit + 143 reports at follow-up)

	High arousal positive affect report discrepancy	Low arousal positive affect report discrepancy	High arousal negative affect report discrepancy	Low arousal negative affect report discrepancy
Fixed effects: *b (SE)* [95% CI]				
Intercept	0.09 *(0.08)*	-0.07 *(0.08)*	0.17 *(0.08)* * [0.01,0.33]	0.05 *(0.07)*
Retrospective report time	0.07 *(0.05)*	-0.13 *(0.06)* * [-0.25,-0.01]	0.12 *(0.05)* * [0.02,0.22]	0.14 *(0.05)* ** [0.04,0.24]
Average momentary affect	-0.43 *(0.12)* *** [-0.67,-0.19]	-0.42 *(0.13)* ** [-0.68,-0.16]	-0.64 *(0.15)* *** [-0.94,-0.34]	-0.46 *(0.14)* ** [-0.74,-0.18]
Peak momentary affect	0.24 *(0.10)* * [0.04,0.44]	0.00 *(0.15)*	0.18 *(0.06)* ** [0.06,0.30]	-0.09 *(0.07)*
Recent momentary affect	0.06 *(0.09)*	0.37 *(0.11)* *** [0.15,0.59]	0.16 *(0.12)*	0.06 *(0.10)*
Age (years)	-0.00 *(0.00)*	-0.00 *(0.00)*	-0.01 *(0.00)* ** [-0.01,-0.01]	-0.01 *(0.00)* *** [-0.01,-0.01]
Ethnicity	0.23 *(0.09)* ** [0.05,0.41]	-0.12 *(0.08)*	-0.06 *(0.09)*	-0.05 *(0.08)*
Advanced vocabulary score	-0.03 *(0.01)* * [-0.05,-0.01]	0.00 *(0.01)*	0.02 *(0.01)*	0.01 *(0.01)*
Letter sets score	0.02 *(0.02)*	0.01 *(0.02)*	-0.01 *(0.02)*	-0.03 *(0.02)* * [-0.07,-0.00]
Neuroticism	0.00 *(0.01)*	-0.02 *(0.01)* * [-0.03,-0.00]	0.02 *(0.01)* * [0.00,0.03]	0.01 *(0.01)*
Extraversion	0.02 *(0.01)* *** [0.01,0.04]	-0.02 *(0.01)* * [-0.03,-0.00]	-0.00 *(0.01)*	-0.01 *(0.01)*
Peak affect x report time	0.15 *(0.13)*	0.12 *(0.19)*	-0.06 *(0.07)*	0.06 *(0.09)*
Recent affect x report time	-0.09 *(0.09)*	-0.36 *(0.10)* *** [-0.56,-0.17]	-0.34 *(0.10)* *** [-0.53,-0.14]	-0.06 *(0.09)*
Neuroticism x report time	-0.01 *(0.01)*	-0.00 *(0.01)*	0.02 *(0.01)*	0.00 *(0.01)*
Extraversion x report time	-0.02 *(0.01)* * [-0.04,-0.00]	-0.01 *(0.01)*	-0.01 *(0.01)*	-0.02 *(0.01)* * [-0.03,-0.00]
Random effects				
Intercept variance	0.14	0.14	0.15	0.13
Report time slope variance	0.11	0.13	0.10	0.09
Model fit indices				
Intraclass correlation (ICC)	0.43	0.27	0.40	0.41
Deviance reduction	63.68 ***	49.31 ***	80.38 ***	55.29 ***

Note. Retrospective report time coded 0 = exit report, 1 = follow-up report; ethnicity coded 0 = non-Caucasian, 1 = Caucasian; advanced vocabulary scored out of 18; letter sets scored out of 15; all other variables scored on 5-point scales. Deviance reduction compares full model and unspecified model deviance. Gender and timing of peak affect episodes were also examined as covariates; neither significantly predicted any outcomes, hence, more parsimonious models without these terms are presented. Additional models included Agreeableness, which was also associated with retrospective overreporting of high arousal positive affect at exit and underreporting of high and low arousal negative affect at follow-up. Agreeableness associations, however, are beyond the scope of this manuscript, and their inclusion in models does not substantively change reported findings. Retrospective report discrepancy associations with Conscientiousness and Openness to experience were also tested but were not significant. Regression coefficients are unstandardized. * $p < .05$, ** $p < .01$, *** $p < .001$

Figures

Figure 1. Discrepancies in retrospective reports of high arousal positive affect (a), low arousal positive affect (b), high arousal negative affect (c), and low arousal negative affect (d) as a function of retrospective report time for different combinations of neuroticism and extraversion.



Note. HAPA = High Arousal Positive Affect; LAPA = Low Arousal Positive Affect; HANA = High Negative Affect; LANA = Low Arousal Negative Affect, *b* = unstandardized regression weight; *d* = effect size. High and low neuroticism and extraversion are depicted for illustrative purposes only; these were treated as continuous variables in the models. * $p < .05$, ** $p < .01$, *** $p < .001$.