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Changes in Personality Traits and Personality Pathology in Older Adults: Self and Informant Perspectives

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by
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ABSTRACT OF THE DISSERTATION

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Professor Thomas Oltmanns, Chair

A relatively small amount of research has examined personality and personality disorder change from more than one perspective, particularly in older adults. The main aim of this study is to examine personality and personality disorder change in older adults from multiple perspectives including an interview assessment, self-report, and informant-report. Data from the St. Louis Personality and Aging Network (SPAN), a representative sample of St. Louis residents with 1,630 participants and their informants, was used to study change. We use structural equation modeling to test mean-level changes and individual differences in change over the course of the study. For personality disorders, interview assessment showed a decrease in personality pathology whereas both self- and informant-report showed stability or increases in personality pathology. For personality traits, our results also varied by self- or informant-report as self-report showed more stability in personality traits whereas informant-report showed decreases in conscientiousness, extraversion, and neuroticism over the study. The significance of individual differences in change also varied as a function of the type of report: informant-report showed more variability in change than both interview and self-report. These results highlight the utility in studying personality change from different perspectives.

Chapter 1: Introduction

Although personality is defined as individual differences in "enduring patterns of thoughts, feelings, and behaviors," (Roberts & Mroczek, 2008) there is substantial evidence that personality does in fact change over the lifespan (Roberts, Walton, & Viechtbauer, 2006). Personality disorders (PDs) are also defined as "enduring patterns" of maladaptive thoughts, emotions, and behavior (American Psychiatric Association, 2013), and yet they too have been shown to change over periods of time (Lenzenweger, Johnson, & Willett, 2004). Thus, although both definitions of personality are conceptualized as "enduring," implying stability of personality, there is also an important process of change. In order to understand the longitudinal nature of personality it is necessary to analyze both stability and change of normal range personality and maladaptive variants of personality.

1.1 The Importance of Studying Personality and Personality Pathology

Personality traits are important predictors of life outcomes. The Big Five personality traits (extraversion, agreeableness conscientiousness, neuroticism, and openness) are related to individual outcomes like well-being and psychopathology, interpersonal outcomes like quality of relationships, and social outcomes like volunteering and work (Ozer & Benet-Martínez, 2006). In fact, personality has been shown to be as predictive of life outcomes as socioeconomic status and cognitive ability (Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007). Changes in personality over the lifespan have also been shown to be important predictors of life outcomes like mortality (Mroczek & Spiro, 2007), self-rated health (Turiano et al., 2012), and psychopathology (Wright, Pincus, & Lenzenweger, 2011).

Personality pathology is also an important predictor of outcomes like impairments in psychosocial functioning, lower quality of life, and diagnoses of other mental disorders (Skodol,

2008; Zanarini, Frankenburg, Reich, & Fitzmaurice, 2010). Furthermore, personality pathology is related to poorer physical health outcomes and more healthcare utilization (Keuroghlian, Frankenburg, & Zanarini, 2013; Powers & Oltmanns, 2012) as well as relationship outcomes (Zanarini et al., 2015). Changes in personality disorder status over longitudinal follow-up are related to changes in other psychiatric disorders (Shea et al., 2004). Taken together, these results show that the study of the course of personality and personality pathology are important areas of research that provide useful information about life outcomes.

1.2 Personality Development over the Lifespan

Personality changes in characteristic ways across the lifespan. Before describing the ways that personality tends to change it is necessary to define what is meant by personality change. Although personality change can be measured in various ways the two types of change emphasized in this paper are mean-level changes and individual differences in change. Mean-level change describes how the population increases, decreases, or remains stable on traits during a specific time of development, while individual differences in change refers to any individual variability from the mean-levels (Roberts & Mroczek, 2008). Individual differences in change suggest that some individuals do not follow the mean-level changes, i.e., they may remain stable or change in opposite directions than the population level.

As individuals move from adolescence to adulthood, there tends to be mean-level trends of personality change towards maturity (Caspi, Roberts, & Shiner, 2005). In general, individuals become more conscientious, socially dominant (a component of extraversion), and agreeable, and less neurotic and open (Roberts & Mroczek, 2008; Roberts et al., 2006). Mean-level trends of personality change have also been shown for older adults. As adults age, they tend to become less conscientious after middle-age (Lucas & Donnellan, 2011; Specht, Egloff, & Schmukle,

2011). Older adults are also shown to decrease in extraversion and have larger decreases in openness after age 50 (Specht et al., 2011; Wortman, Lucas, & Donnellan, 2012). There is also evidence to suggest that individual differences in change exist across the lifespan and are not limited to specific time periods (Roberts & Mroczek, 2008).

1.3 Theories of Personality Development

Older theories of personality development often proposed that personality was biologically determined, and thus inherently stable over the lifespan, while newer theories have highlighted the impact of both environment and biology on personality (Roberts & Jackson, 2008). The sociogenomic model of personality acknowledges the importance of biological factors, like genetics, but also allows for environmental factors to directly influence state factors like thoughts, behaviors, and feelings, which in turn can alter personality traits in a "bottom-up" way (Roberts & Jackson, 2008). For example, the sociogenomic model of personality theorizes that maintaining a long-term relationship would result in sustained changes in state levels of thoughts, feelings, and behaviors, which in turn may change personality traits. In fact, many findings support the theory that environmental changes can lead to changes in personality, particularly when environment is conceptualized as the experience of major life events (Luhmann, Orth, Specht, Kandler, & Lucas, 2014; Roberts, 2009). A wide and diverse range of experiences and events can change personality, including military training (Jackson, Thoemmes, Jonkmann, Ludtke, & Trautwein, 2012), cognitive training interventions (Jackson, Hill, Payne, Roberts, & Stine-Morrow, 2012), entering a long-term relationship (Lehnart, Neyer, & Eccles, 2010), weight gain (Sutin et al., 2013), and also other life events like marriage and divorce (Specht et al., 2011).

Given this theory of personality development, older adults would also be likely to experience environmental effects on personality. If personality can change as a result of life events, and life events can occur at any point throughout the lifespan, then changes in personality should not be constrained to specific periods during the lifespan. As individuals transition from middle age to older adults they may experiences changes in work status or physical health that could impact personality. Furthermore, the socioemotional selectivity theory suggests that older adults are not stagnant in their goals and values and in fact change behavior, emotion regulation strategies, and social network composition as they begin to see time as limited (Carstensen, Isaacowitz, & Charles, 1999). Thus, theory and previous research suggest that normal-range personality changes throughout the entire lifespan.

1.4 Characteristic Patterns of Personality Pathology Change

Personality disorders also change in characteristic ways over time. Cross-sectional data suggest that the majority of personality disorder features are endorsed less frequently by older adults (Gutiérrez et al., 2012). Although most personality disorders are less likely to be diagnosed in older cohorts, schizoid personality disorder and obsessive-compulsive personality disorder may increase with age (Oltmanns & Balsis, 2011). Consistent with this pattern, in the longitudinal study used for this proposed analyses, obsessive-compulsive personality disorder was the most frequent PD found in a sample of 55-64 year olds (Oltmanns, Rodrigues, Weinstein, & Gleason, 2014).

Within longitudinal studies of personality disorders, personality disorders symptoms also tend to decrease (Lenzenweger et al., 2004; Skodol, 2008; Zanarini, Frankenburg, Hennen, Reich, & Silk, 2006). These results suggest that over a period of time, individuals improve. However, just like with personality traits, there are individual differences in personality disorder

change over time (Lenzenweger et al., 2004). Although longitudinal studies exist that track the course of personality disorders, there has been little emphasis on studying personality change in older adults (Oltmanns & Balsis, 2011). There are open questions about the rate of change of personality pathology in older adults.

1.5 The Unique Contribution of Informant-reports of Personality

The majority of research on personality change, either with the Big Five traits or personality pathology, has been conducted using self-report questionnaires or interviews. Very little research has incorporated other sources of information like informant-ratings of personality, particularly in the study of personality disorders (Oltmanns & Turkheimer, 2009). Yet, there has long been evidence that informant-reports of personality provide useful information about life outcomes and can often provide unique contributions to the understanding of personality (Carlson, Vazire, & Oltmanns, 2013; Clifton, Turkheimer, & Oltmanns, 2004; Fiedler, Oltmanns, & Turkheimer, 2004; Jackson, Connolly, Garrison, Leveille, & Connolly, 2015; Vazire, 2010).

Given that self- and informant-reports of personality are not redundant and can predict different outcomes, various models have been suggested to explain these discrepancies. The self-other knowledge asymmetry model posits that these differences can be explained by the observability (i.e., the information available) and evaluativeness (i.e., the motivation for ego-protection) of personality traits (Vazire, 2010). Similarly, other models that attempt to explain the differences in self- and informant-reports also point to differences that self and others have in access to information, motivation to report accurately, and a tendency to use overall evaluative judgments (Beer & Watson, 2008).

These models were initially developed to understand self and other discrepancies in normal personality, but also have implications for personality pathology. Personality disorders differ on observable behaviors and evaluativeness, e.g., antisocial PD has high observability and high evaluativeness, suggesting that informants may be more valid in identifying specific types of personality disorders (Carlson et al., 2013). Interestingly, peer reports of personality pathology are even predictive of early discharge from the military (Fiedler et al., 2004). Another intriguing finding is that informants report more features of personality pathology than is found in self-report, and also informants report the presence of personality pathology at lower levels of the disorder, at least in terms of narcissistic personality disorder (Cooper, Balsis, & Oltmanns, 2012). Consequently, there is a benefit to studying personality pathology change with both informant- and self-reports.

1.6 Informant Reports of Personality

There have been few studies of observer ratings of personality across the lifespan. Two studies using cross-sectional data concluded that observer ratings mostly follow the patterns of increased maturity found in self-report data (McCrae & Terracciano, 2005; McCrae et al., 2004). However, when longitudinal designs have been used to study self- and observer-reports, the self- and observer-ratings have not replicated the cross-sectional patterns. One study found that spouse ratings differed over 6 years of follow-up in that participants rated decreases or stability in neuroticism and stability in positive emotions (a facet of extraversion) whereas their partners reported increases in neuroticism and a decrease in positive emotions (Costa & McCrae, 1988). Consistent with these results, a more recent study found that over two years of follow-up, spouses' ratings differed from their partners' ratings of their personality (Watson & Humrichouse, 2006). Self-ratings of personality showed increases in conscientiousness and

agreeableness and decreases in neuroticism, whereas partner reports showed the opposite pattern with decreases in conscientiousness and agreeableness (and also extraversion and openness). The authors of this study termed this the "honeymoon effect" where spouses initially rate their partners higher on positive traits during the first assessment but then more negatively on positive traits at later assessments (Watson & Humrichouse, 2006). These findings highlight that our current conceptualization of the maturity principle of personality development may be dependent on the source of the information.

Building from the initial study on the honeymoon effect, Jackson, Fraley, Vicary, and Brumbaugh (2017) looked at personality trait development of romantic couples, using a Big Five personality trait measure assessed at 5 time points over the course of a year. The study found an increase in self-reported personality traits of agreeableness and conscientiousness and a decrease in neuroticism, i.e., in the expected positive direction towards maturity. However, partners reported change in the opposite direction by reporting decreases in conscientiousness, extraversion, and openness, replicating the honeymoon effect. Furthermore, this study explored possible explanations for this effect. They found that partners had an initial positive bias and also tended to rate their partner's personality based on changes in relationship quality and functioning. In addition to analyzing mean-level trends this study also examined individual differences in change and found that although the mean-level trends were in an opposite direction, change was positively correlated at the individual level (i.e., positive and significant correlations of slope estimates for self- and partner-report). This indicates that to some degree partners are able to observe and report on personality, and that the change estimates have some validity across assessment source (Jackson et al., 2017). This study will serve as a methodological example for the proposed study.

Whereas there is some evidence that self- and informant-report differ for normal personality, there is only one study that explores personality pathology development with both self- and informant-ratings (Cooper, Balsis, & Oltmanns, 2014). Consistent with the results on the honeymoon effect, the longitudinal course of PD symptoms as reported by both self- and informant- report differed. Self-reported PD symptoms decreased or remained stable over 2.5 years of follow-up as assessed by two different self-report measures and a diagnostic interview. These results were anticipated given the findings on personality pathology decreasing over time (Lenzenweger et al., 2004). However, informants reported that PD symptoms increased over time (Cooper et al., 2014). These results were completely novel in the field of maladaptive personality. Although the Cooper et al. (2014) study was an important starting point to understand the course of informant-rated personality disorder symptoms, there were some limitations of the analyses. First, the data analysis was strictly focused on examining change by setting baseline scores of both the participant and informant to 0 and calculating mean change scores. Therefore, these results do not provide information about the initial levels of personality (and personality pathology) reported. Secondly, there were only two data points available and more appropriate longitudinal analyses could not be used. With the addition of more data points, both latent growth curves and individual differences in personality change could be analyzed.

When taking into account all of the literature on personality and personality development, some broad statements can be made about the field and areas of future study. First, both personality traits and personality pathology are predictive of major life outcomes. Secondly, personality tends to change in consistent ways across the lifespan, although individual differences exist in the rate and direction of change. Studying these developmental processes are critical as they also predict important life outcomes. Third, there is a lack of research on how

older adults change (particularly in the realm of personality pathology) even though important life events occur during this period like retirement and physical health declines. Fourth, informant-reports of personality provide unique information for both normal personality and personality pathology. Yet, there is a dearth of research in the development of personality that uses other sources of information. Finally, the small amount of research that does take into account other sources of information appears to show different trajectories in change than self-report does.

1.7 Current Study

The focus of the current study was to examine some of these unanswered questions about personality development. The goal of this study was to use similar methods to the Jackson et al. (2017) study to explore more in depth the initial results from Cooper et al. (2014). We analyzed personality change by examining three different aspects of personality; 1) Big Five personality traits (i.e., normative personality), 2) personality pathology as assessed by a self-report DSM-IV measure, and 3) interview-rated personality pathology. In addition to self-reported personality, we analyzed informant-reported personality to broaden the scope of personality assessment. The main analysis of this study was to use latent growth curve modeling to examine the mean-level trends of personality development and to explore individual differences in change. Furthermore, if any discrepancies between self- and informant report were identified, informant type, e.g., living with the participant vs. living apart, was examined to determine if it was related to change. A major contribution of this research is that the participants were all adults transitioning from middle to older age (on average 60 years old at baseline). This is a particularly important age to study personality, as these adults transition from working to retirement and start to experience more health problems.

1.8 Aims and Hypotheses

Aim 1. To study mean-level changes in personality over time, i.e., whether average levels of personality are stable, as rated by both self- and informant-reports. The aim is also to test whether self-reported change in personality differs from informant-reported change in personality. Personality will be broadly conceptualized as both normative personality traits, e.g., the Five-Factor Model, and personality pathology.

Hypothesis 1. There will be mean-level change in personality over the period of the study. Consistent with Cooper et al. (2014), mean level change will differ between participant- and informant-reports, with participants reporting more positive change (i.e., less pathology and more normative personality development) whereas informants will report change in the opposite direction. For example, in terms of normal-range personality, participants will report increases in agreeableness and decreases in neuroticism, whereas informants will report decreases in agreeableness and increases in neuroticism. For personality disorders, participants will report less personality pathology, i.e., a decrease in mean scores of each disorder, whereas informants will report more pathology. Finally, interview-rated personality disorders will show a decrease over time and will be more consistent with self-report.

Aim 2. To examine individual differences in both initial personality levels and personality change. Also, to determine if, at the individual level, participants and informants ratings of personality development are related.

Hypothesis 2. Similar to the results in the Jackson et al. (2017), there will be individual differences (variability) in change for self- and informant-rated personality and personality disorders, indicating not everyone changes similarly. Further, there will be a positive correlation

at the individual level between perspectives, indicating that informants share the participants' view of the participants' personality cross-sectionally and longitudinally.

Aim 3. Assuming that participants and informants differ on mean-level change in personality, to test whether the type of informant (living together vs. living apart) is related to these differences. Although many different variables could be tested to try to understand the mean-level differences, type of informant is intended to be an exploratory analysis and not a comprehensive attempt to understand the mean-level differences.

Hypothesis 3. Although this aim is exploratory in nature, the type of informant will be related to the self- and informant-reported personality change. Informants that live with the participants should show less discrepancy between informant-report and self-report than informants who do not live with the participants, as they have access to more information about the participants and will be less likely to rely on global judgments of personality (Beer & Watson, 2008).

Chapter 2: Method

2.1 Design

The data used in this study are a subset from the St. Louis Personality and Aging Network (SPAN) (Oltmanns et al., 2014). The main aims of the SPAN study are to examine personality, health, and aging in late middle age. For a full description and explanation of recruitment procedures see Oltmanns et al. (2014). Initial data collection began in 2007 for the in-person baseline assessment and 1,630 participants were enrolled in the study (wave 1). Approximately 2.5 years later, a second in-person assessment was started and 1,270 participants were interviewed (wave 2). Approximately 7 years after baseline in 2014, a third in-person follow-up assessment began, and 756 participants had completed this follow-up by the spring of 2016 (wave 3).

2.2 Participants

The participants are a representative community sample of the population of St. Louis in the age range of 55-64. At baseline, the participants were 56% female, 65% Caucasian, and had a mean age of 60. The majority of participants (68%) reported some schooling above a high school education. Participants were asked to identify which range their annual household income fell into and the median household income was between $40,000 and $59,000.

2.3 Informants

Each participant was asked to nominate an informant who would be able to provide a description of his or her personality. Participants were encouraged to identify an informant that lived with them, although if that was not possible they were told to nominate the person who knows them “very well” and with whom they have regular contact. At baseline, 91% of

participants had an informant complete the assessment. About half of the informants are spouses or romantic partners, while family (22%) and friends (23%) made up the other informants.

2.4 Measures

Nature of relationship. Participants filled out a questionnaire about the nature of his or her relationship to the informant. This measure includes questions about the type of relationship (e.g., spouse, family member, friend, etc.), how long the participant has known the informant, and if the participant currently or has ever lived with the informant. The measure also asks how often the participant sees the informant face-to-face, how often the participant talks to the informant, how well the participant knows the informant, how much the participant likes the informant, and finally how close the participant is to the informant. The informant was also given the same questionnaire about his or her relationship with the participant.

Analyses were conducted to explore the relationship between participants and informants. At baseline, participants reported knowing their informants for an average of 32 years (ranging from .5 to 63 years) and approximately half of the participants reported currently living with their informants. The majority of participants reported seeing their informant face-to-face every day (54%), talking to their informant every day (66%), knowing their informant better than anyone else (52%), liking their informant more than anyone else (52%), and being closer to their informant than anyone else (50%). The informant responses were consistent with those of the participants. Taken together, these results indicate that the informants in our study should be appropriate for rating participants on a variety of measures.

Self-rated personality. Personality traits were assessed using the NEO-PI-R (Form S) (Costa & McCrae, 1992). The NEO-PI-R is a self-report measure that assesses the Five-Factor Model of personality as well as six facets within each of five domains, resulting in 30 total

facets. The Five-Factor Model of personality includes the domains of neuroticism, openness, conscientiousness, extraversion, and agreeableness. Participants were asked how much they agree with 240 items on a five-point scale ranging from 0 (*Strongly disagree*) to 4 (*Strongly agree*). For example "I am not a worrier" is an item that measures the fact of anxiety under the domain of neuroticism. The NEO-PI-R is a commonly used measure that has been shown to have good reliability and validity (Costa & McCrae, 1992).

Informant-rated personality. Informants were asked to rate the participant's personality with the informant version of the NEO-PI-R (Form R). The informant version has the same format and number of items as the self-report version but with the items worded in the third person, e.g., "she is not a worrier" for a woman participant.

Self-rated personality disorder symptoms. Personality disorder symptoms were measured with the Multisource Assessment of Personality Pathology (MAPP). The MAPP (Oltmanns & Turkheimer 2006) has a self-report version that asks for a rating on a scale of 0 (I am never like this – 0% of the time) to 4 (I am always like this – 100% of the time) of every diagnostic criterion from the 10 DSM-IV-TR personality disorders. The MAPP was developed to take DSM-IV criteria and turn them into non-psychological language. For example, the DSM-IV (and DSM 5) criterion of "preoccupation with fantasies of unlimited success, power, brilliance, beauty, or ideal love" (American Psychiatric Association, 2013, p. 669) of narcissistic personality disorder is translated to "I find myself daydreaming about power, success and/or the perfect relationship that will be mine someday." The MAPP allows for a continuous score to be calculated by summing the score of each criterion within a disorder and then dividing by the number of criteria. The MAPP has been shown to be related to two other measures of personality pathology and to have adequate reliability (Okada & Oltmanns, 2009).

Informant-rated personality disorder symptoms. An informant-report version of the MAPP was created to assess personality disorder symptoms from the perspective of the informant. The number of items and response options are the same as the self-report version except for the measure was written in the third-person, e.g., "she daydreams about power, success and/or the perfect relationship that will be hers someday."

Interview-rated personality disorders. Personality disorders were assessed using the Structured Interview for DSM-IV Personality (SIDP-IV) (Pfohl, Blum, & Zimmerman, 1997). The SIDP-IV is a semistructured diagnostic interview administered by trained raters that includes 101 questions that correspond to the diagnostic criteria for the 10 PDs. Responses are rated on a scale from 0 (not present) to 3 (strongly present) about the presence of the symptoms within the past five years. A scaled score for each disorder was calculated by summing the items associated with each PD and dividing by the number of items for that PD, so that the range of total scaled scores was 0 – 3.

Note about data collection at wave 2. Due to a gap in funding, data collection at wave 2 occurred in two phases. The majority of participants (n = 995) completed wave 2, on schedule, 2.5 years after the first assessment. However, some participants (n = 269) completed wave 2 approximately 4 years after wave 1.

Note about personality disorders at wave 3. At wave 3, three personality disorders were not assessed with either the MAPP or the SIDP. At wave 1, histrionic PD (n = 3), dependent PD (n = 2), and schizotypal PD (n = 1) were seldom diagnosed with the SIDP, and therefore were removed from the protocol to save time. Thus, these PDs will be excluded from longitudinal analyses.

2.5 Analytic Plan

First, means and standard deviations for each of the variables were calculated. Then, zero-order correlations were examined at each assessment between self- and informant-report. These correlations allowed us to examine test-retest correlations (also know as rank-order consistency), and the convergent validity between measures.

For the first aim, latent growth curve models were used to analyze mean-level change over time. These analyses were conducted in R, using structural equation modeling in the lavaan package with a full information maximum likelihood estimator (Rosseel, 2012). Different models were analyzed for each of the five personality traits and each of the seven personality disorders. In these models, the latent slope parameter indicated whether participants changed over time and the latent intercept indicated initial levels of the trait at baseline. For each trait and PD, participant and informant ratings were included in the same model to directly test any differences in intercept or slope using bivariate latent growth models (Jackson & Allemand, 2014). The intercept factor was set to 0, while the slope factor was set to 0 at wave 1, either .36 or .57 at wave 2 (to account for discrepancies in assessment times; see above note about data collection at wave 2), and 1 at wave 3. In order to properly account for the differences in assessment periods at wave 2, multiple-group models were included in each change model. This additional parameter allowed the slope factor to differ at wave 2 while constraining all other parameters including means, variances, and covariances. Fit indices were examined to determine model fit including chi-square, root mean square error of approximation (RMSEA), comparative fit index (CFI), and standardized root-mean-square residual (SRMR). For acceptable fit in longitudinal models, RMSEA should be below .08, CFI should be above .90, and SRMR should be below .10 (Byrne, Lam, & Fielding, 2008).

Measurement invariance tests were conducted for each personality trait over the three waves of data for both participants and informants using confirmatory factor analysis (see Jackson & Allemand, 2014 for an explanation of the importance of testing for measurement invariance while using latent growth curve models). Each personality trait was tested separately, meaning that 10 total models were run with both self- and informant-report personality traits analyzed. Before conducting CFA, it was determined that the 6 facets of each personality trait would be used as latent indicators. The first level of analysis was to test a configural invariance model where model fit indices were used to determine if configural invariance was met. Then, a weak invariance model where the factor loadings were constrained across time was nested within the configural invariance model. Finally, a strong invariance model where both the factor loadings and item intercepts were constrained to be equal across time was nested within the weak invariance model. At each stage, model fit was tested with a chi-square difference test and also CFI change was examined. If either the chi-square difference test was not significant or the CFI change was less than .01 then the models were determined to be longitudinally invariant (Cheung & Rensvold, 2002). These measurement invariance models were then used to run second-order latent growth models.

For the second aim, individual differences in change were analyzed by examining the variance parameters of the intercepts and slopes of both self- and informant-ratings of traits and pathology. Significant variance of these two parameters indicated that individual participants differed in their initial levels and change within traits. Next, the correlations (i.e., covariance) of the slope parameters between self-report and informant report of personality were examined to determine whether there was a relationship between the two assessment methods on the individual level. A positive correlation indicated that participants self-report of personality and

informant-reported personality displayed similar patterns of change over time. A zero or negative correlated indicated that that participants and informants were not reporting similar patterns of change.

Finally, for the third aim, two conditions must have been met in order to test whether the different types of informants (live-in vs. live-apart) have varying trajectories. Self- and informant-report would first have to be shown to have significant differences in the slope parameter as tested by a chi-square difference test. Furthermore, as the hypothesis is that the direction of change will be different in these two types of report, these significant differences must be in direction (e.g., self-report shows an increase while informant report shows a decrease) and not just magnitude (e.g., informant-report shows faster declines than self-report). Second, there would have had to have been significant variance in the slope parameter for informant-report. As both of these conditions were not met for any personality disorder or personality trait, the planned exploratory analyses were not conducted.

Chapter 3: Results

Table 1 presents the descriptive statistics for all personality variables across the three waves of data collection. Table 1 shows that self- and informant-report of personality disorder features were endorsed more frequently than in an interview-rated assessment. For example, the means of self- and informant-report of schizoid PD features were 1.07 and 1.05 at wave 1, respectively, indicating that both participants and informants rated that, on average, the participants "occasionally" (i.e., 25% of the time) engaged in behaviors and experiences consistent with schizoid personality disorder features. However, the mean for interview-rated schizoid PD was .14, indicating that schizoid PD features, on average, were rated as "not present" by interviewers. Table 1 reveals the relative frequency of which personality disorders were more commonly endorsed. For example, obsessive-compulsive PD features were more commonly endorsed than antisocial PD features across all three assessment measures. Table 1 also includes the means for personality traits as rated by both self- and informant-report.

The associations between self-, informant-, and interview-report of personality disorders across the three waves of data collection are found in Tables 2-8. The tables include test-retest reliability (i.e., estimates on the diagonal) and estimates of convergent validity between the measures (i.e., estimates off the diagonal). As anticipated, the test-retest reliability for each of the personality disorder assessments are higher than the across measure associations. For example in Table 2, the correlation between self-reported antisocial PD at wave 1 and self-reported antisocial PD at wave 2 is .53. In comparison, the correlation of self-reported antisocial PD and interview-rated antisocial PD at wave 1 is .27, while the correlation of interview-rated antisocial PD and informant-reported antisocial PD at wave 1 and is .21. In general, the correlations across

Table 1
Means and standard deviations for all personality variables

	Wave 1[a] M(SD)			Wave 2[b] M(SD)			Wave 3[c] M(SD)		
Personality Disorder	Int.	Self	Inf.	Int.	Self	Inf.	Int.	Self	Inf.
Antisocial	0.05	0.51	0.58	0.02	0.49	0.59	0.02	0.55	0.60
	(0.16)	(0.37)	(0.50)	(0.08)	(0.35)	(0.52)	(0.08)	(0.36)	(0.50)
Avoidant	0.16	0.63	0.59	0.11	0.58	0.62	0.11	0.68	0.66
	(0.34)	(0.56)	(0.60)	(0.28)	(0.52)	(0.65)	(0.27)	(0.59)	(0.66)
Borderline	0.13	0.43	0.55	0.10	0.39	0.54	0.08	0.46	0.56
	(0.21)	(0.40)	(0.54)	(0.19)	(0.37)	(0.55)	(0.19)	(0.40)	(0.53)
Narcissistic	0.18	0.64	0.76	0.14	0.61	0.74	0.13	0.66	0.76
	(0.28)	(0.42)	(0.58)	(0.25)	(0.39)	(0.59)	(0.21)	(0.40)	(0.62)
Obsessive-	0.37	1.16	1.38	0.32	1.12	1.33	0.23	1.19	1.42
compulsive	(0.34)	(0.56)	(0.62)	(0.29)	(0.55)	(0.65)	(0.25)	(0.56)	(0.64)
Paranoid	0.17	0.73	0.94	0.13	0.74	0.96	0.12	0.85	0.94
	(0.26)	(0.55)	(0.72)	(0.24)	(0.51)	(0.73)	(0.21)	(0.56)	(0.70)
Schizoid	0.14	1.07	1.05	0.15	1.06	1.06	0.10	1.09	1.11
	(0.25)	(0.53)	(0.61)	(0.26)	(0.54)	(0.62)	(0.22)	(0.53)	(0.60)
Personality									
Agree.		2.70	2.59		2.73	2.57		2.70	2.61
		(0.32)	(0.48)		(0.30)	(0.49)		(0.32)	(0.50)
Cons.		2.57	2.67		2.60	2.63		2.57	2.64
		(0.36)	(0.53)		(0.36)	(0.53)		(0.38)	(0.51)
Extra.		2.25	2.30		2.24	2.25		2.21	2.24
		(0.38)	(0.45)		(0.39)	(0.43)		(0.40)	(0.44)
Neuro.		1.51	1.62		1.44	1.62		1.51	1.57
		(0.43)	(0.55)		(0.43)	(0.54)		(0.45)	(0.53)
Open.		2.34	2.21		2.33	2.22		2.35	2.22
		(0.38)	(0.40)		(0.39)	(0.40)		(0.40)	(0.41)

Note. Int. = Structured Interview for DSM-IV Personality, Self = Multisource Assessment of Personality Pathology (MAPP) self-report, and Inf. = MAPP informant-report. [a] n = 1630. [b] n = 1270. [c] n = 756.

Table 2

Correlations between interview, self-, and informant-report of antisocial PD over three waves

Antisocial PD	**Interview**			**Self-report**			**Informant-report**	
Interview	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2
Wave 1	1							
Wave 2	0.34	1						
Wave 3	0.27	0.34	1					
Self-report								
Wave 1	0.27	0.19	0.22	1				
Wave 2	0.15	0.13	0.11	0.53	1			
Wave 3	0.14	0.12	0.14	0.47	0.49	1		
Informant-report								
Wave 1	0.21	0.17	0.14	0.22	0.19	0.19	1	
Wave 2	0.13	0.15	0.17	0.23	0.27	0.22	0.59	1
Wave 3	0.10	0.13	0.08	0.16	0.19	0.22	0.57	0.64

Note. Interview = Structured Interview for DSM-IV Personality, Self –report = Multisource Assessment of Personality Pathology (MAPP) self-report, and Informant-report = MAPP informant-report.

Table 3

Correlations between interview, self-, and informant-report of avoidant PD over three waves

Avoidant PD	**Interview**			**Self-report**			**Informant-report**	
Interview	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2
Wave 1	1							
Wave 2	0.68	1						
Wave 3	0.69	0.75	1					
Self-report								
Wave 1	0.59	0.53	0.57	1				
Wave 2	0.50	0.57	0.62	0.68	1			
Wave 3	0.53	0.52	0.57	0.66	0.71	1		
Informant-report								
Wave 1	0.29	0.23	0.27	0.27	0.27	0.27	1	
Wave 2	0.29	0.27	0.31	0.26	0.30	0.31	0.67	1
Wave 3	0.27	0.23	0.24	0.28	0.30	0.30	0.68	0.76

Note. Interview = Structured Interview for DSM-IV Personality, Self –report = Multisource Assessment of Personality Pathology (MAPP) self-report, and Informant-report = MAPP informant-report.

Table 4
Correlations between interview, self-, and informant-report of borderline PD over three waves

Borderline PD	**Interview**			**Self-report**			**Informant-report**	
Interview	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2
Wave 1	1							
Wave 2	0.53	1						
Wave 3	0.58	0.67	1					
Self-report								
Wave 1	0.42	0.46	0.51	1				
Wave 2	0.33	0.49	0.51	0.62	1			
Wave 3	0.33	0.42	0.50	0.57	0.65	1		
Informant-report								
Wave 1	0.34	0.34	0.30	0.26	0.25	0.27	1	
Wave 2	0.33	0.34	0.28	0.27	0.28	0.29	0.66	1
Wave 3	0.33	0.40	0.35	0.31	0.28	0.32	0.65	0.72

Note. Interview = Structured Interview for DSM-IV Personality, Self –report = Multisource Assessment of Personality Pathology (MAPP) self-report, and Informant-report = MAPP informant-report.

Table 5
Correlations between interview, self-, and informant-report of narcissistic PD over three waves

Narcissistic PD	**Interview**			**Self-report**			**Informant-report**	
Interview	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2
Wave 1	1							
Wave 2	0.52	1						
Wave 3	0.45	0.52	1					
Self-report								
Wave 1	0.33	0.33	0.34	1				
Wave 2	0.29	0.32	0.35	0.62	1			
Wave 3	0.27	0.29	0.35	0.53	0.60	1		
Informant-report								
Wave 1	0.24	0.17	0.17	0.13	0.15	0.12	1	
Wave 2	0.21	0.19	0.18	0.16	0.22	0.12	0.70	1
Wave 3	0.23	0.19	0.21	0.15	0.20	0.18	0.67	0.73

Note. Interview = Structured Interview for DSM-IV Personality, Self –report = Multisource Assessment of Personality Pathology (MAPP) self-report, and Informant-report = MAPP informant-report.

Table 6

Correlations between interview, self-, and informant-report of obsessive-compulsive PD over three waves

OCPD	**Interview**			**Self-report**			**Informant-report**	
Interview	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2
Wave 1	1							
Wave 2	0.46	1						
Wave 3	0.46	0.58	1					
Self-report								
Wave 1	0.35	0.41	0.40	1				
Wave 2	0.30	0.43	0.43	0.62	1			
Wave 3	0.30	0.41	0.46	0.59	0.59	1		
Informant-report								
Wave 1	0.20	0.20	0.18	0.19	0.24	0.20	1	
Wave 2	0.16	0.22	0.19	0.19	0.24	0.23	0.62	1
Wave 3	0.22	0.27	0.21	0.19	0.25	0.22	0.67	0.72

Note. Interview = Structured Interview for DSM-IV Personality, Self –report = Multisource Assessment of Personality Pathology (MAPP) self-report, and Informant-report = MAPP informant-report.

Table 7
Correlations between interview, self-, and informant-report of paranoid PD over three waves

Paranoid PD	**Interview**			**Self-report**			**Informant-report**	
Interview	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2
Wave 1	1							
Wave 2	0.44	1						
Wave 3	0.43	0.45	1					
Self-report								
Wave 1	0.43	0.42	0.40	1				
Wave 2	0.36	0.39	0.40	0.62	1			
Wave 3	0.34	0.38	0.44	0.63	0.66	1		
Informant-report								
Wave 1	0.20	0.17	0.13	0.27	0.21	0.18	1	
Wave 2	0.22	0.18	0.19	0.25	0.22	0.23	0.69	1
Wave 3	0.24	0.22	0.21	0.26	0.22	0.24	0.70	0.74

Note. Interview = Structured Interview for DSM-IV Personality, Self –report = Multisource Assessment of Personality Pathology (MAPP) self-report, and Informant-report = MAPP informant-report.

Table 8
Correlations between interview, self-, and informant-report of schizoid PD over three waves

Schizoid PD	**Interview**			**Self-report**			**Informant-report**	
Interview	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2
Wave 1	1							
Wave 2	0.60	1						
Wave 3	0.57	0.62	1					
Self-report								
Wave 1	0.33	0.37	0.32	1				
Wave 2	0.30	0.34	0.31	0.57	1			
Wave 3	0.29	0.34	0.35	0.52	0.53	1		
Informant-report								
Wave 1	0.21	0.23	0.16	0.25	0.21	0.24	1	
Wave 2	0.24	0.23	0.15	0.23	0.22	0.27	0.60	1
Wave 3	0.13	0.15	0.14	0.25	0.20	0.25	0.55	0.60

Note. Interview = Structured Interview for DSM-IV Personality, Self –report = Multisource Assessment of Personality Pathology (MAPP) self-report, and Informant-report = MAPP informant-report.

measures demonstrated convergent validity, as all of the associations were positive and significant. Comparing across tables also yields information about the differences in the assessment of specific personality disorders. For example, Table 2 shows that interview-rated antisocial PD at wave 1 and wave 2 were correlated at .34, while Table 3 shows that interview-rated avoidant PD at wave 1 and wave 2 were correlated at .68, demonstrating that test-retest reliability varied across personality disorders. Of note, unlike self- and informant-report, interview-rated personality disorders were assessed at each wave by a different interviewer.

Tables 9-13 show the correlations of self- and informant-report of personality traits. Test-retest correlations were very high for personality traits. For example, Table 9 shows that wave 1 and wave 2 agreeableness were correlated at .80 for self-report and .81 for informant-report. Self- and informant-report also show convergent validity. For example, Table 9 shows that self- and informant-report of agreeableness were correlated at .37 at wave 1. These results are consistent with effect sizes from other studies indicating that there is significant overlap between self- and informant-report of personality traits (Vazire, 2010; Vazire & Carlson, 2010).

Table 9

Correlations between self- and informant-report of agreeableness over three waves

Agreeableness	**Self-report**			**Informant-report**		
Self-report	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3
Wave 1	1					
Wave 2	0.80	1				
Wave 3	0.78	0.82	1			
Informant-report						
Wave 1	0.37	0.32	0.32	1		
Wave 2	0.37	0.36	0.35	0.81	1	
Wave 3	0.35	0.36	0.37	0.77	0.83	1

Note. Self -report= Multisource Assessment of Personality Pathology (MAPP) self-report, and Informant-report = MAPP informant-report.

Table 10

Correlations between self- and informant-report of conscientiousness over three waves

Conscientiousness	**Self-report**			**Informant-report**		
Self-report	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3
Wave 1	1					
Wave 2	0.84	1				
Wave 3	0.82	0.85	1			
Informant-report						
Wave 1	0.45	0.44	0.44	1		
Wave 2	0.43	0.45	0.42	0.83	1	
Wave 3	0.41	0.42	0.42	0.80	0.85	1

Note. Self -report= Multisource Assessment of Personality Pathology (MAPP) self-report, and Informant-report = MAPP informant-report.

Table 11
Correlations between self- and informant-report of extraversion over three waves

Extraversion	**Self-report**			**Informant-report**		
Self-report	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3
Wave 1	1					
Wave 2	0.88	1				
Wave 3	0.86	0.88	1			
Informant-report						
Wave 1	0.55	0.53	0.55	1		
Wave 2	0.53	0.53	0.54	0.81	1	
Wave 3	0.51	0.53	0.55	0.80	0.86	1

Note. Self -report= Multisource Assessment of Personality Pathology (MAPP) self-report, and Informant-report = MAPP informant-report.

Table 12
Correlations between self- and informant-report of neuroticism over three waves

Neuroticism	**Self-report**			**Informant-report**		
Self-report	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3
Wave 1	1					
Wave 2	0.83	1				
Wave 3	0.82	0.84	1			
Informant-report						
Wave 1	0.45	0.41	0.39	1		
Wave 2	0.41	0.44	0.44	0.80	1	
Wave 3	0.41	0.43	0.44	0.77	0.85	1

Note. Self -report= Multisource Assessment of Personality Pathology (MAPP) self-report, and Informant-report = MAPP informant-report.

Table 13
Correlations between self- and informant-report of openness over three waves

Openness	**Self-report**			**Informant-report**		
Self-report	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3
Wave 1	1					
Wave 2	0.89	1				
Wave 3	0.87	0.89	1			
Informant-report						
Wave 1	0.56	0.56	0.55	1		
Wave 2	0.56	0.57	0.58	0.84	1	
Wave 3	0.57	0.59	0.60	0.81	0.86	1

Note. Self -report= Multisource Assessment of Personality Pathology (MAPP) self-report, and Informant-report = MAPP informant-report.

3.1 Changes in Personality

Interview-rated personality disorder change. Table 14 shows model fit indices for the SIDP. Except for antisocial personality disorder (RMSEA = .12, CFI = .72, SRMR = .10), model fit is acceptable (RMSEA range .05 - .11, CFI range .94 - .98, SRMR range .04 - .10).[1] Table 15 shows the latent growth model estimates of the intercept and slope of each personality disorder, as well as variance estimates for each of these parameters. Figures 1–7 also visually show the growth curves of each interview-rated personality disorder. As predicted, personality disorders as assessed by interviews all show significant declines over the course of the study (slope estimates range from -.01 to -.13).

[1] The hypothesis is that the model for antisocial personality disorder does not fit well given that SIDP antisocial PD has very little variability in the initial level of pathology (mean = .04 at wave 1; see also Figure 1).

Table 14
SIDP fit indices

Model	χ 2	*df*	RMSEA	CFI	SRMR
Antisocial	91.99*	7	0.12	0.72	0.10
Avoidant	58.39*	7	0.10	0.97	0.07
Borderline	72.03*	7	0.11	0.94	0.09
Narcissistic	48.35*	7	0.09	0.94	0.07
Obsessive-compulsive	21.48*	7	0.05	0.98	0.04
Paranoid	25.88*	7	0.06	0.97	0.04
Schizoid	46.48*	7	0.08	0.96	0.10

Note. ***p* values < .001.

Table 15

Latent growth model estimates of personality disorder SIDP change

		Mean	Variance
Antisocial	Intercept	**0.029 (.003)**	**0.004 (.001)**
	Slope	**-0.010 (.004)**	0.000 (.002)
Avoidant	Intercept	**0.143 (.008)**	**0.071 (.004)**
	Slope	**-0.048 (.008)**	-0.002 (.008)*
Borderline	Intercept	**0.112 (.005)**	**0.020 (.002)**
	Slope	**-0.030 (.006)**	0.007 (.004**)**
Narcissistic	Intercept	**0.172 (.006)**	**0.041 (.003)**
	Slope	**-0.044 (.008)**	**0.024 (.007)****
Obsessive-compulsive	Intercept	**0.363 (.008)**	**0.048 (.004)**
	Slope	**-0.132 (.009)**	**0.023 (.010)****
Paranoid	Intercept	**0.159 (.006)**	**0.028 (.003)**
	Slope	**-0.042 (.008)**	0.001 (.007)
Schizoid	Intercept	**0.148 (.006)**	**0.043 (.003)**
	Slope	**-0.038 (.007)**	**0.020 (.006)****

Bold = estimate is significantly different than 0. Standard errors are given in the parentheses. * negative variance should be treated as 0 variance, ** indicates that the slope variance is significantly different than 0 as tested by a model fit chi-square difference test. Intercept variances were not tested using a model fit chi-square difference test as this was not the primary research question.

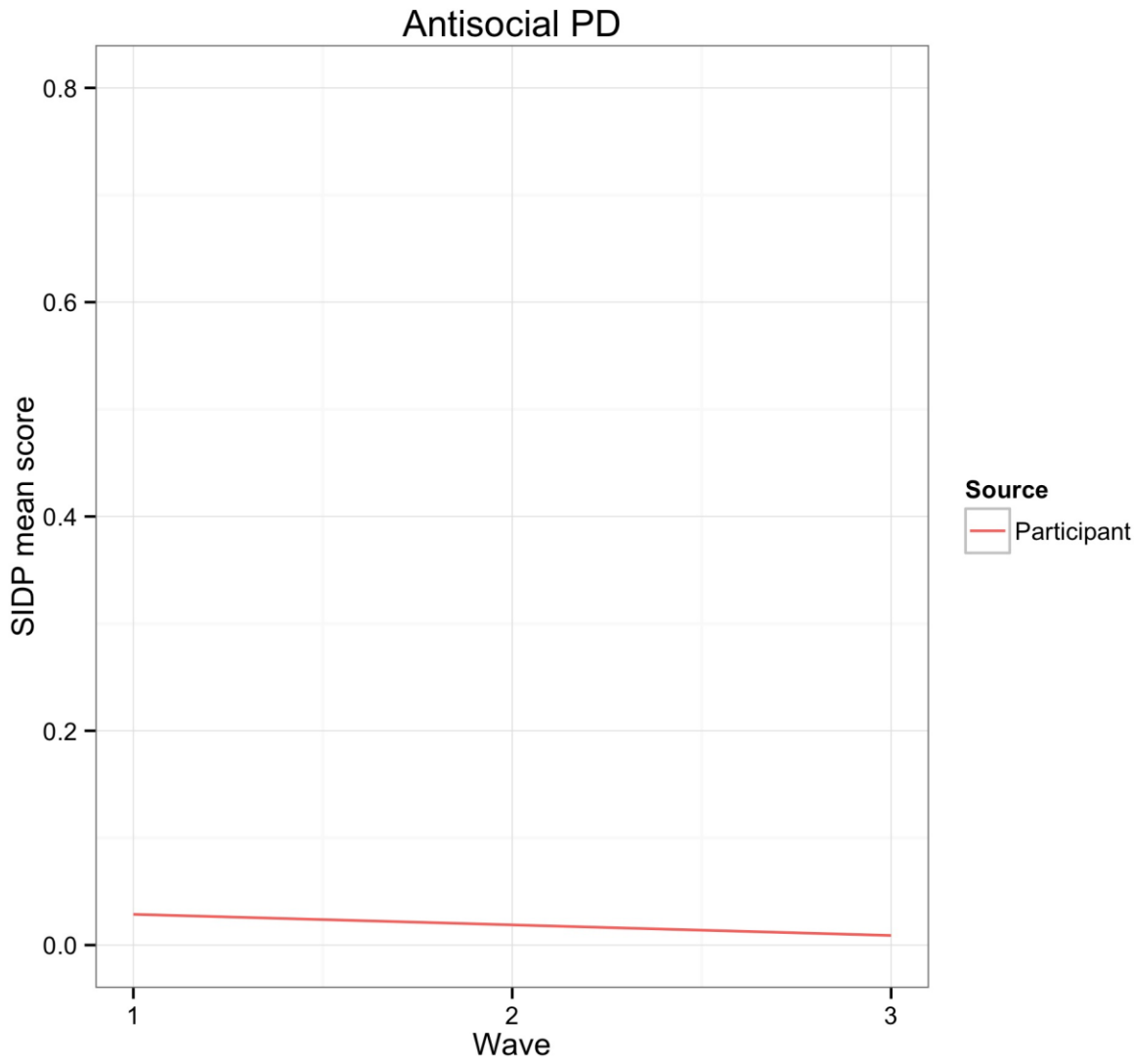

Figure 1. Antisocial PD SIDP change.

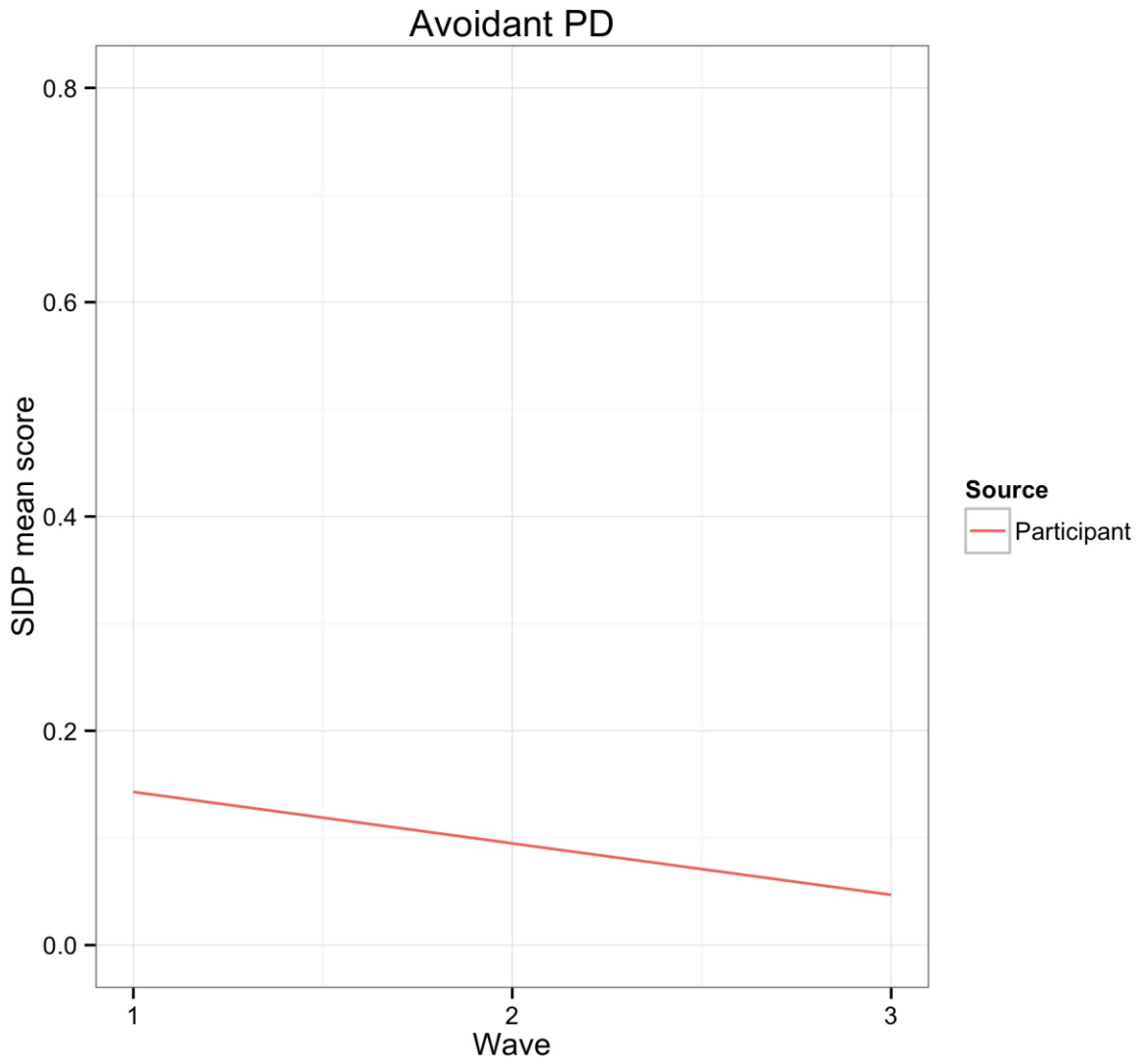

Figure 2. Avoidant PD SIDP change.

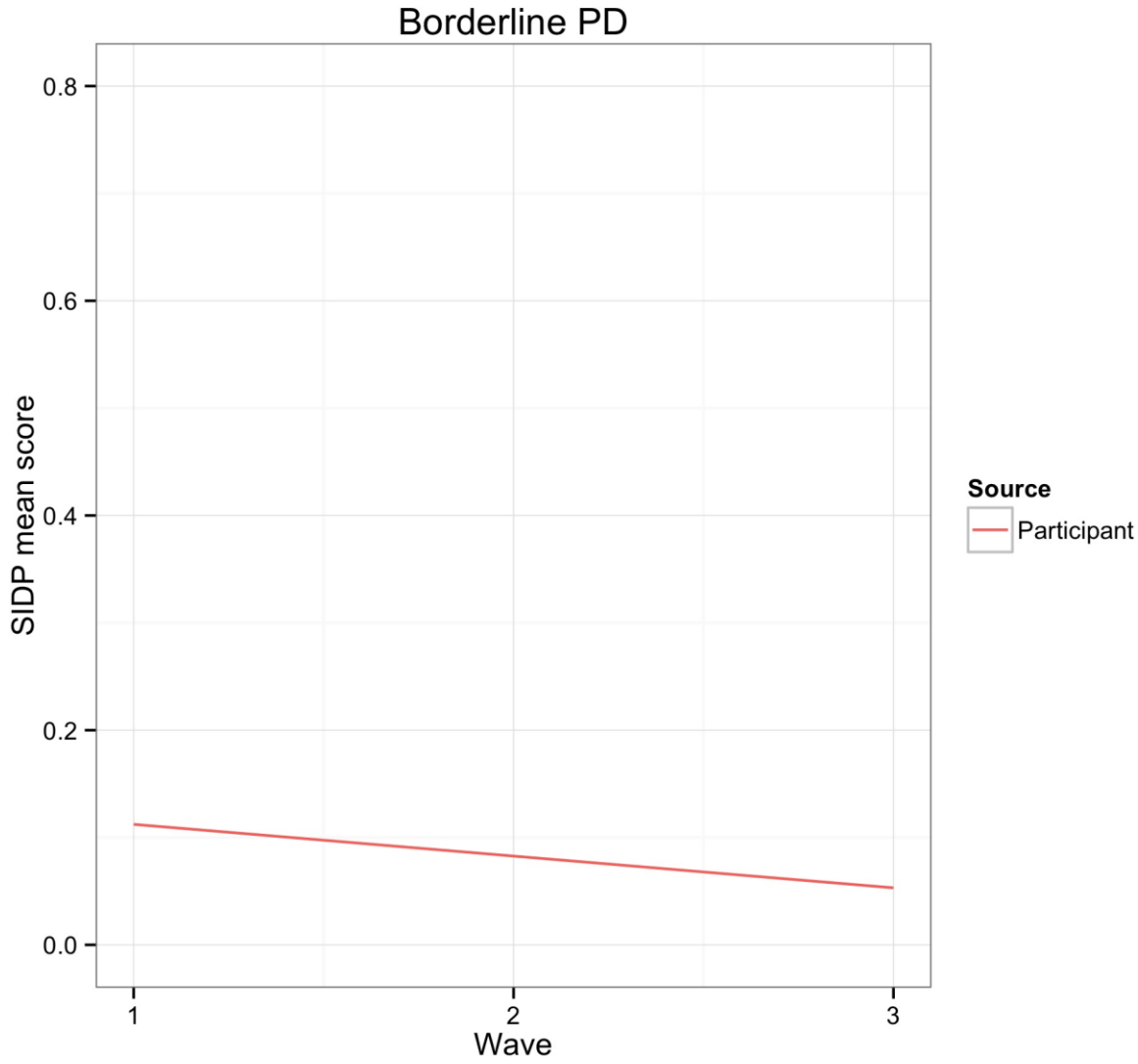

Figure 3. Borderline PD SIDP change.

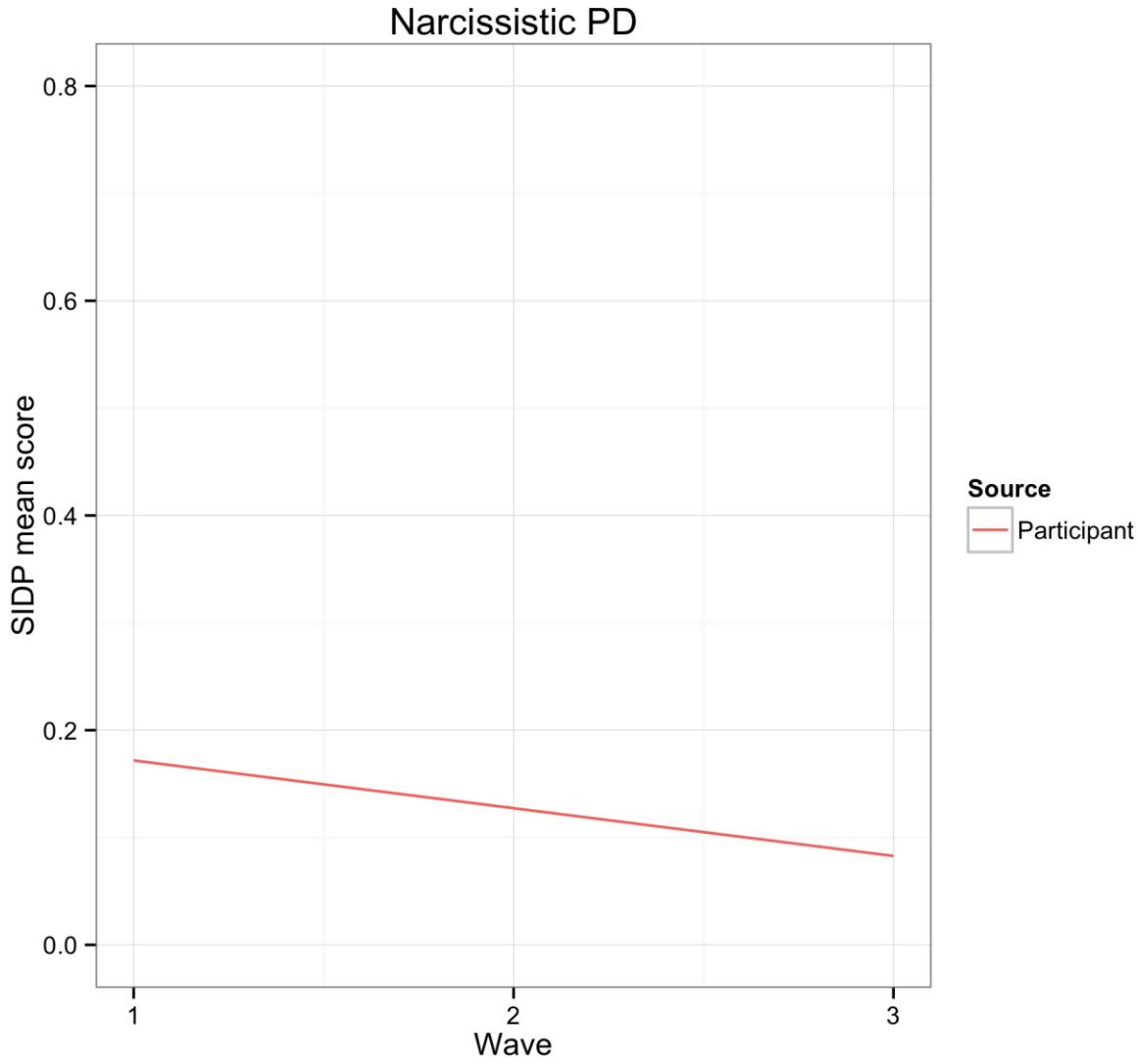

Figure 4. Narcissistic PD SIDP change.

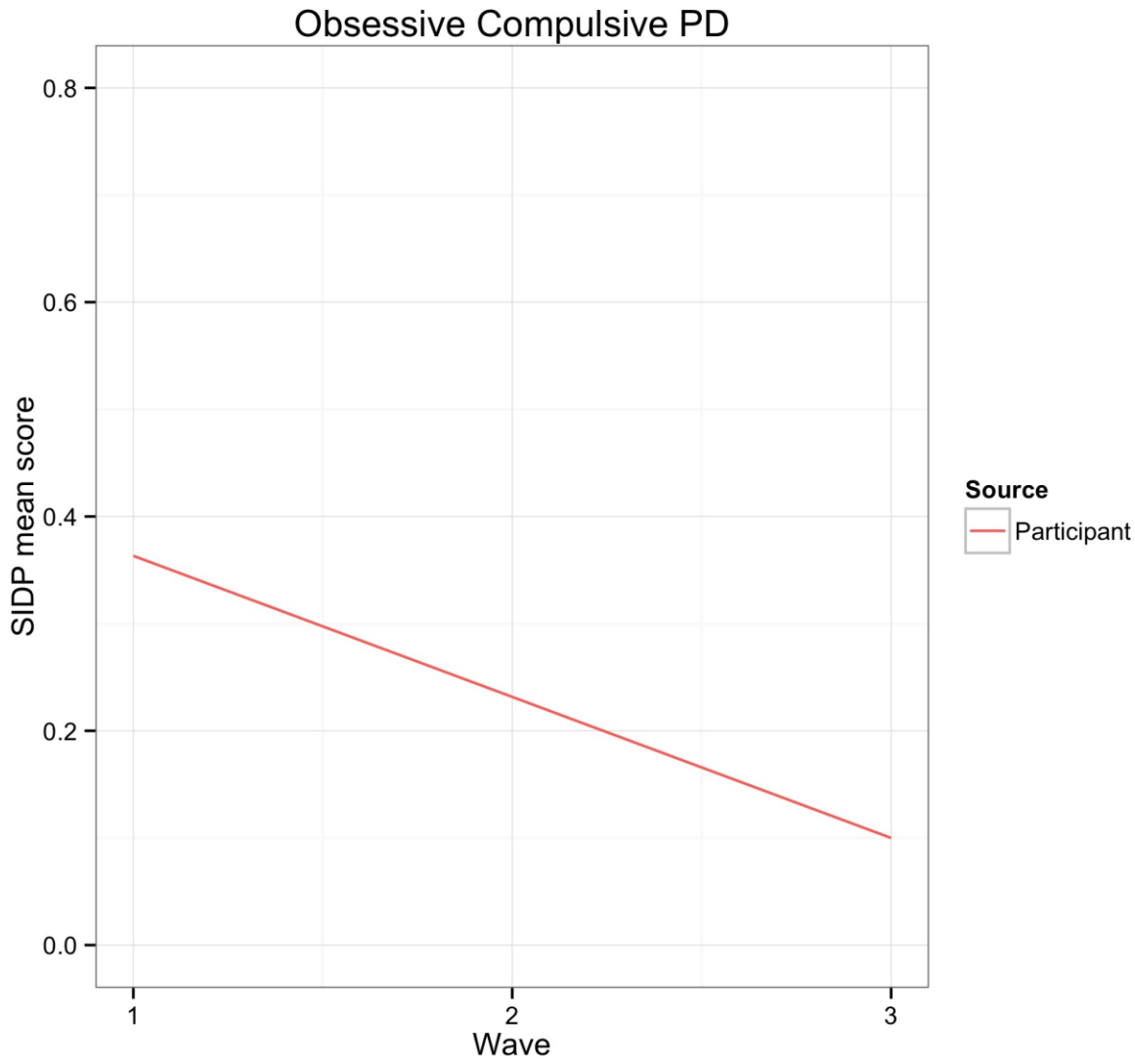

Figure 5. Obsessive Compulsive PD SIDP change.

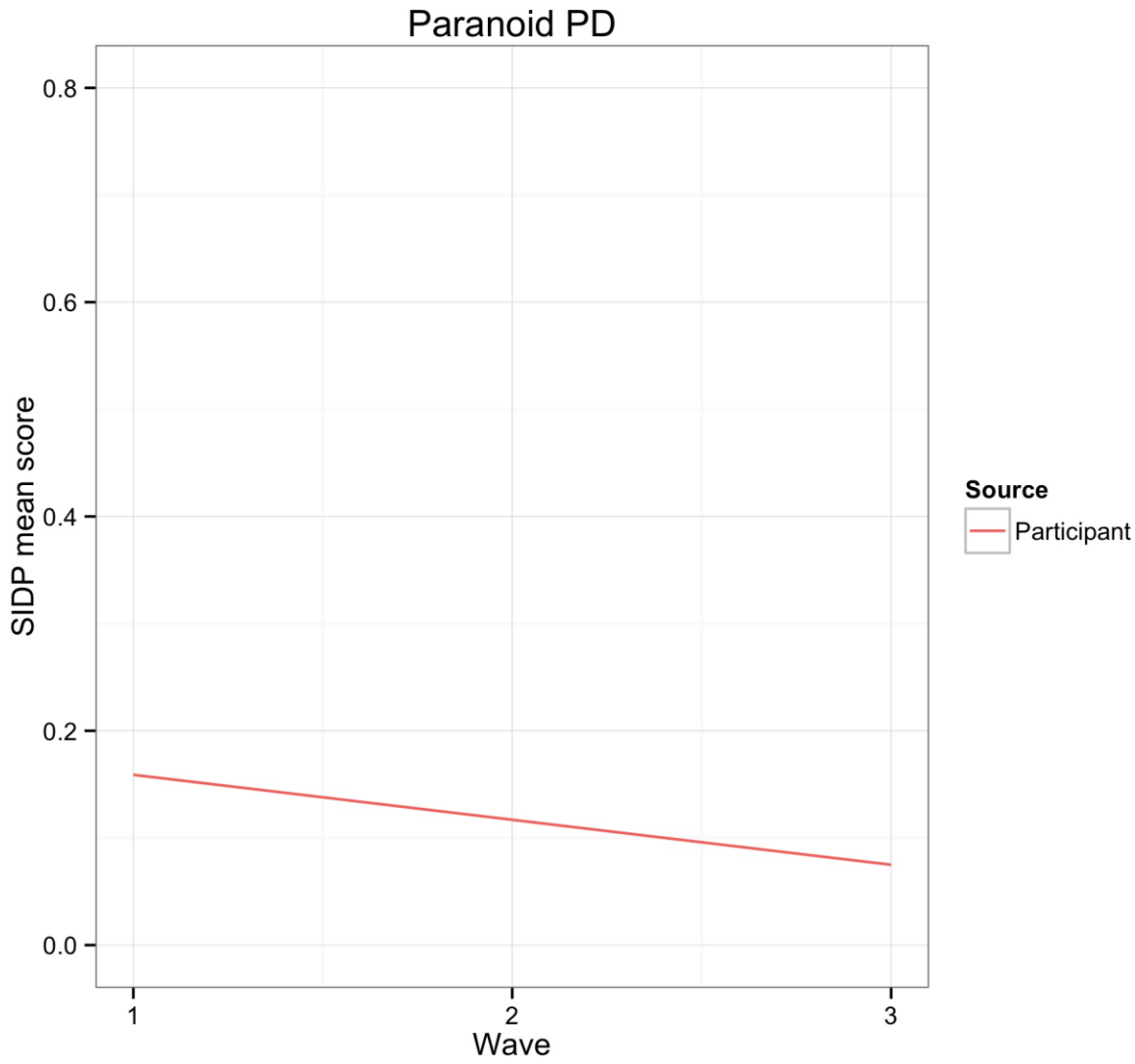

Figure 6. Paranoid PD SIDP change.

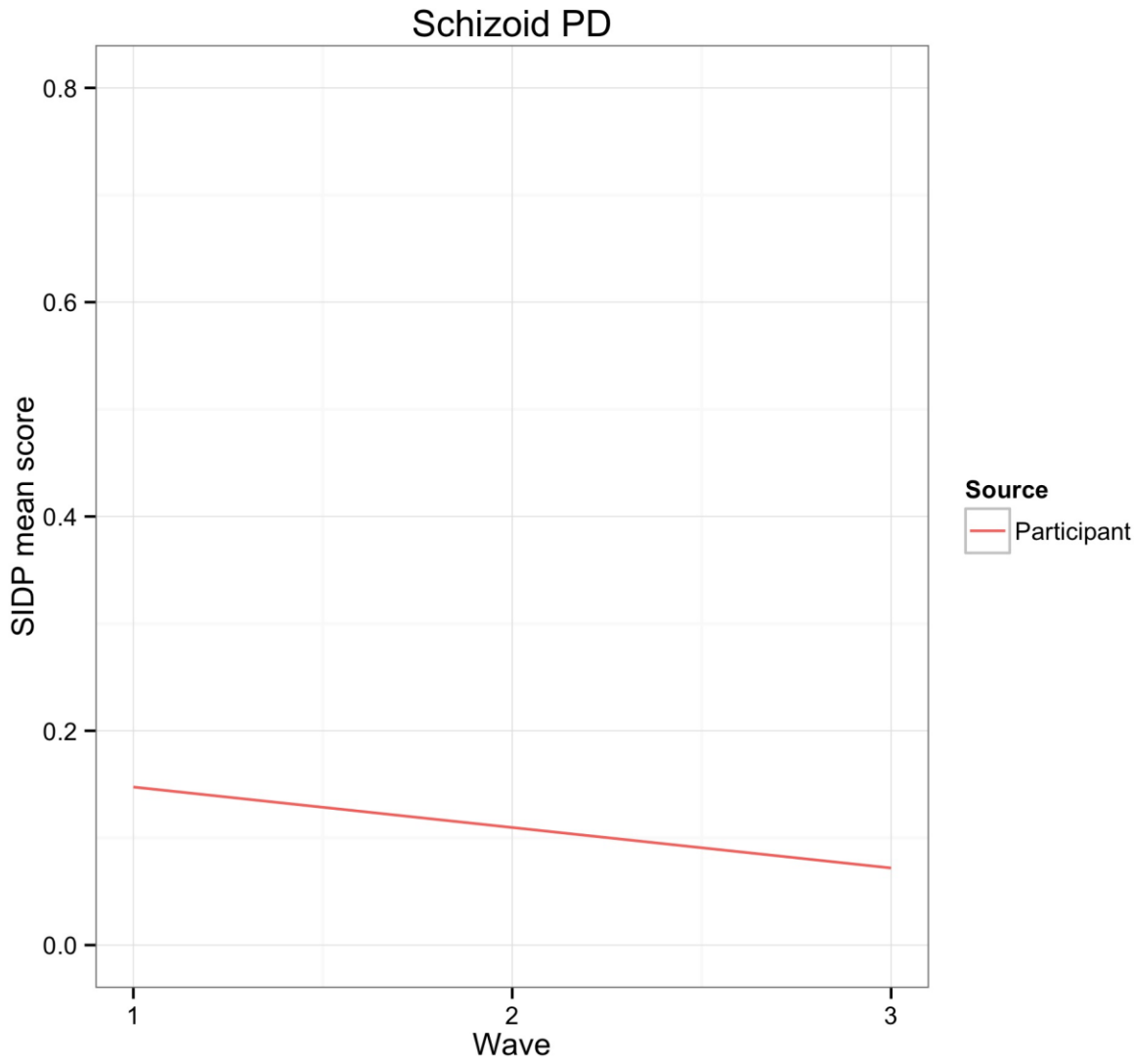

Figure 7. Schizoid PD SIDP change.

In terms of variance, all of the personality disorders have significant variance in the intercept parameter, indicating that there were individual differences in initial levels of personality pathology for the participants. However, contrary to expectations, only three personality disorders show significant variance in the slopes, indicating that there are not individual differences in personality disorder change for all disorders. That is, most interview-rated personality pathology is changing in the same way across participants. Narcissistic PD, obsessive-compulsive PD, and schizoid PD are the personality disorders that show significant individual variability in change over the course of the study.

Self- and informant-rated personality disorder change. Table 16 shows model fit indices for the bivariate models of self- and informant-report MAPP change. Model fit is acceptable for all models (RMSEA range .01 - .07, CFI range .96 - .99, SRMR range .03 - .06). As noted in the method, these models include both self- and informant-report of personality pathology modeled together to directly test any differences in slope. Table 17 shows the latent growth model estimates of the intercept and slope of each personality disorder for both self- and informant-report, as well as variance estimates for each of these parameters. Figures 8 – 14 also visually show the growth curves of each personality disorder. These figures show that self- and informant-report differed in initial levels of pathology. Except for avoidant PD and schizoid PD (Figures 9 and 14 show similar initial levels of pathology), informants reported higher levels of pathology for the participants than the participants rated themselves. Table 17 shows that in stark contrast to the SIDP change estimates, MAPP self-report of personality pathology shows increases in all personality disorders over the course of the study (slope estimates range from .02 to .16). Informant-report of antisocial and narcissistic PD show stability (i.e., no change) in personality pathology over the study, while informant-report of the other five personality

disorders show increases similar to that in the MAPP self-report (slope estimates range from .03 to .08). Figure 13 highlights that self- and informant-report of paranoid PD are discrepant in initial reports of pathology, but converge at wave 3. In fact, paranoid PD is the only personality disorder in which the slope estimate of self-report and the slope estimate of informant-report are significantly different from each other as determined by a chi-square difference test. Although both self- and informant-report show increases in paranoid PD pathology over the course of the study, self-report shows a more rapid increase in pathology. Thus, contrary to hypothesis 1, self- and informant-report of personality change are not discrepant and instead show the same pattern of change.

In terms of individual differences in change (also found in Table 17), all of the personality disorders as assessed by the MAPP had significant variance in the intercept parameter, indicating that there were individual differences in initial levels of personality pathology for the participants in both self- and informant-report. In terms of slope variance, only self-reported narcissistic PD had significant variance in the slope, while informant-reported avoidant PD, borderline PD, narcissistic PD, paranoid PD, and schizoid PD showed significant variance in the slope parameters. Thus, informant-report of pathology showed more variability (i.e., individual differences) in the trajectory of change than self-report. That is, participants' self-report followed the same trend of increases in pathology over the course of the study while informant-report slopes were more variable from the mean-level estimates. Thus, the mean-level estimate was more accurate for self-report than informant-report. Table 18 shows the unstandardized and standardized covariance of slopes for self- and informant-report. Although the majority of the correlated change was positive, these results were not statistically significant which means that there was no significant association between self- and informant-report slopes.

Table 16
MAPP fit indices for bivariate self- and informant-report models

Model	χ^2	*df*	RMSEA	CFI	SRMR
Antisocial	77.69*	28	0.05	0.97	0.03
Avoidant	96.07*	28	0.06	0.98	0.05
Borderline	124.76*	28	0.07	0.96	0.06
Narcissistic	63.56*	28	0.04	0.98	0.04
Obsessive-compulsive	72.84*	28	0.04	0.98	0.04
Paranoid	45.55*	28	0.03	0.99	0.04
Schizoid	31.62	28	0.01	0.99	0.03

***p* values < .001.

Table 17

Latent growth model estimates of personality disorder MAPP change

		Mean		Variance	
		Self	Informant	Self	Informant
Antisocial	Intercept	**0.497 (.009)**	**0.581 (.013)**	**0.077 (.006)**	**0.159 (.011)**
	Slope	**0.038 (.011)**	0.030 (.017)	0.003 (.016)	0.060 (.033)
Avoidant	Intercept	**0.601 (.014)**	**0.596 (.015)**	**0.199 (.012)**	**0.265 (.016)**
	Slope	**0.046 (.016)**	**0.061 (.019)**	-0.012 (.028)*	**0.124 (.039)****
Borderline	Intercept	**0.409 (.010)**	**0.554 (.014)**	**0.096 (.006)**	**0.206 (.013)**
	Slope	**0.052 (.012)**	**0.034 (.016)**	0.022 (.016)	**0.075 (.032)****
Narcissistic	Intercept	**0.627 (.010)**	**0.758 (.015)**	**0.117 (.007)**	**0.241 (.014)**
	Slope	**0.028 (.013)**	0.012 (.018)	**0.039 (.018)****	**0.077 (.037)****
Obsessive-compulsive	Intercept	**1.145 (.014)**	**1.365 (.016)**	**0.189 (.013)**	**0.245 (.017)**
	Slope	**0.033 (.017)**	**0.052 (.019)**	-0.025 (.034)*	0.047 (.044)
Paranoid	Intercept	**0.718 (.013)**	**0.946 (.018)**	**0.176 (.012)**	**0.388 (.022)**
	Slope	**0.164 (.016)*****	**0.049 (.021)*****	-0.016 (.031)*	**0.105 (.051)****
Schizoid	Intercept	**1.066 (.013)**	**1.055 (.015)**	**0.177 (.013)**	**0.251 (.017)**
	Slope	**0.037 (.017)**	**0.080 (.021)**	0.055 (.032)	**0.118 (.045)****

Bold = estimate is significantly different than 0. Standard errors are given in the parentheses. * negative variance should be treated as 0 variance, ** indicates that the slope variance is significantly different than 0 as tested by a model fit chi-square difference test. Intercept variances were not tested using a model fit chi-square difference test as this was not the primary research question. *** indicates the slopes of self- and informant- report are significantly different from each other.

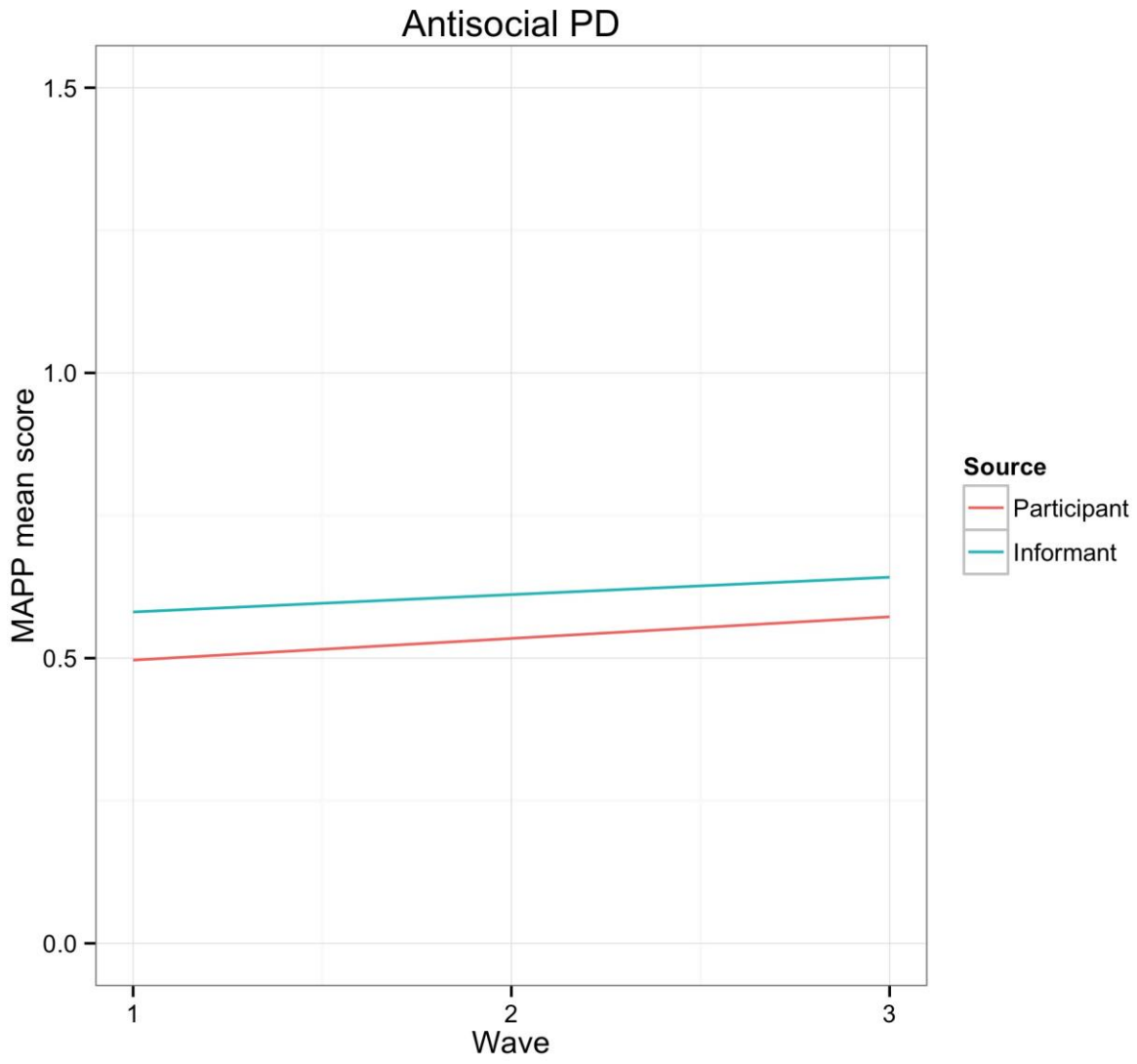

Figure 8. Antisocial PD MAPP self- and informant- change.

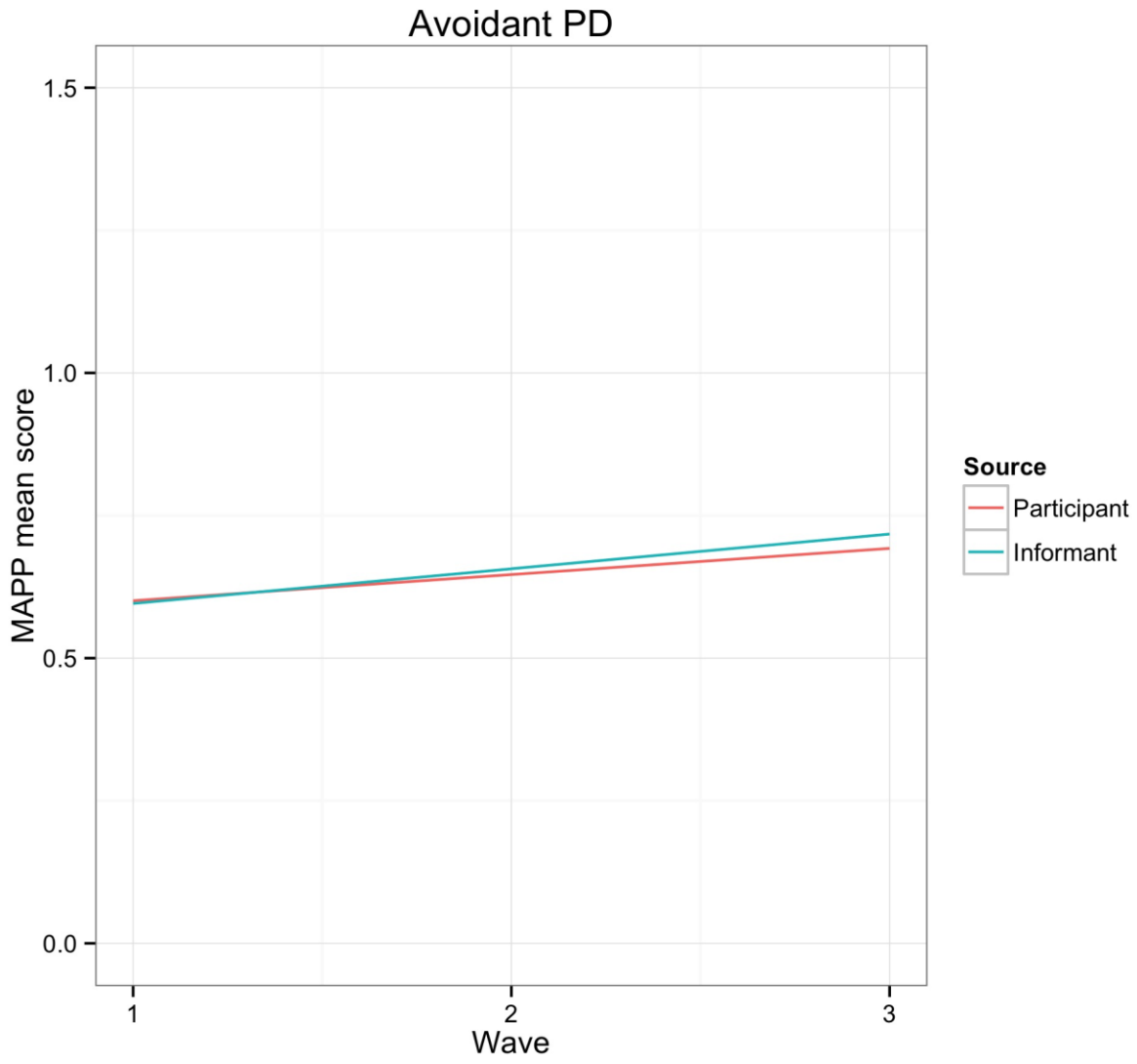

Figure 9. Avoidant PD MAPP self- and informant- change.

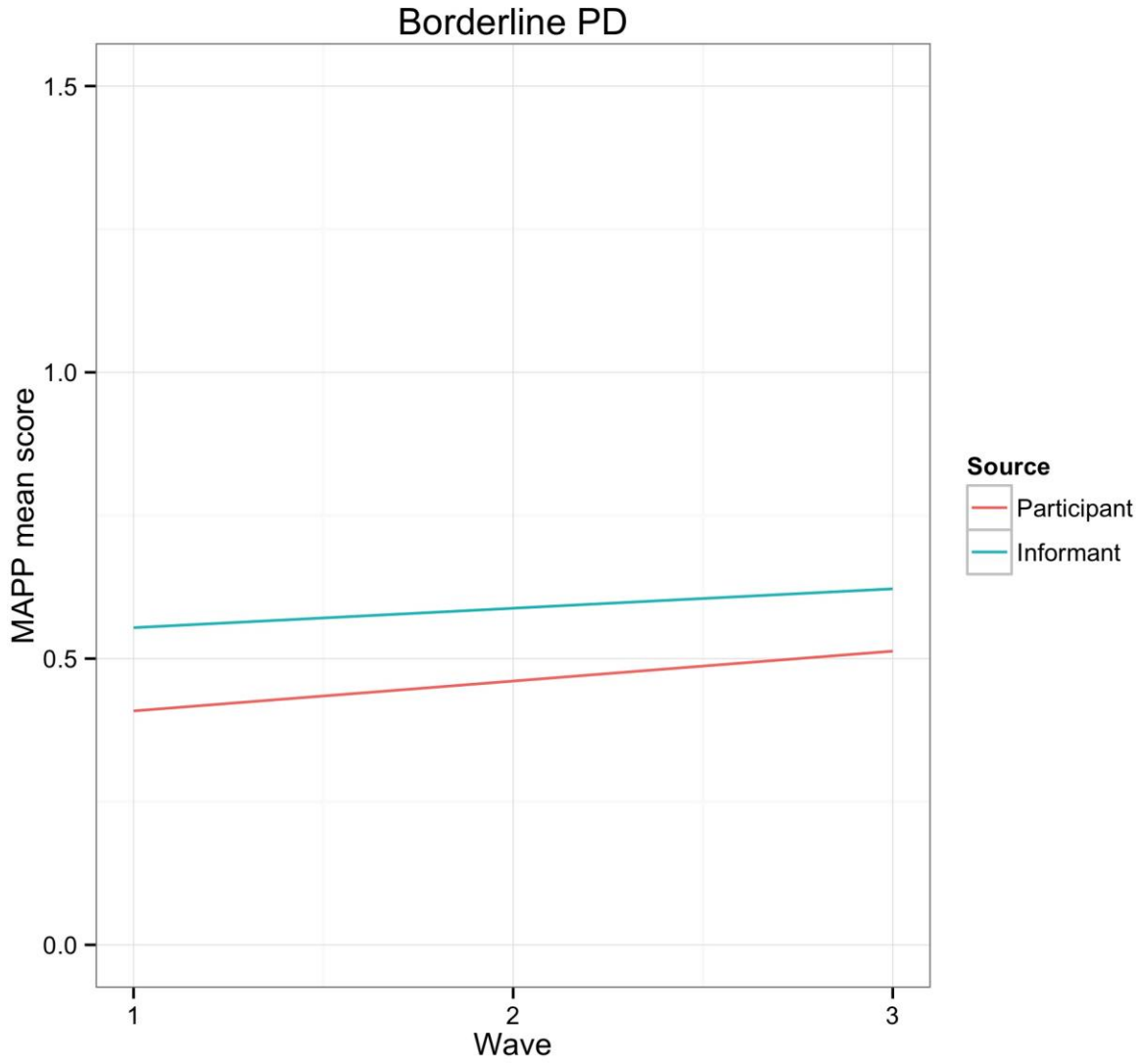

Figure 10. Borderline PD MAPP self- and informant- change.

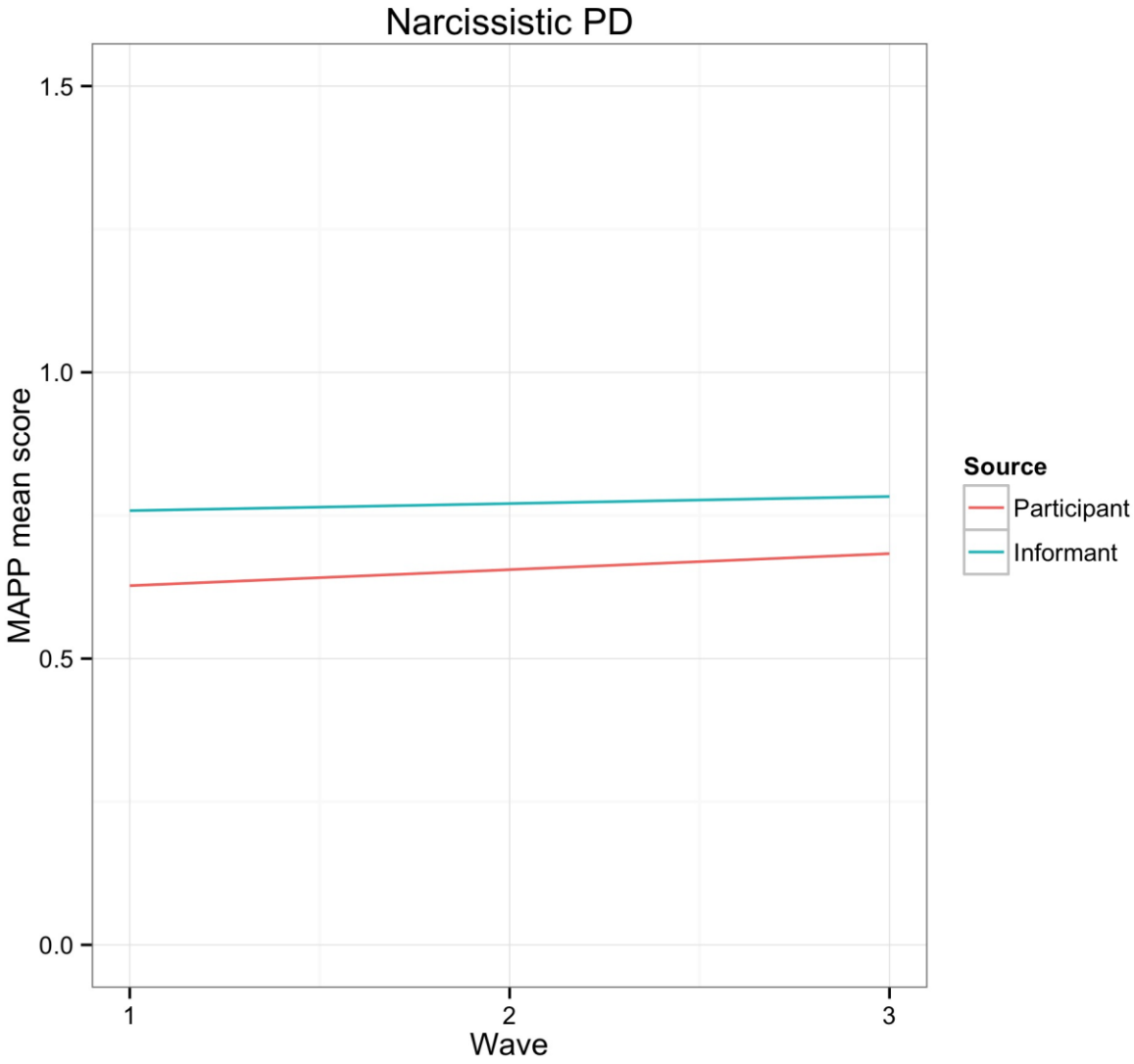

Figure 11. Narcissistic PD MAPP self- and informant- change.

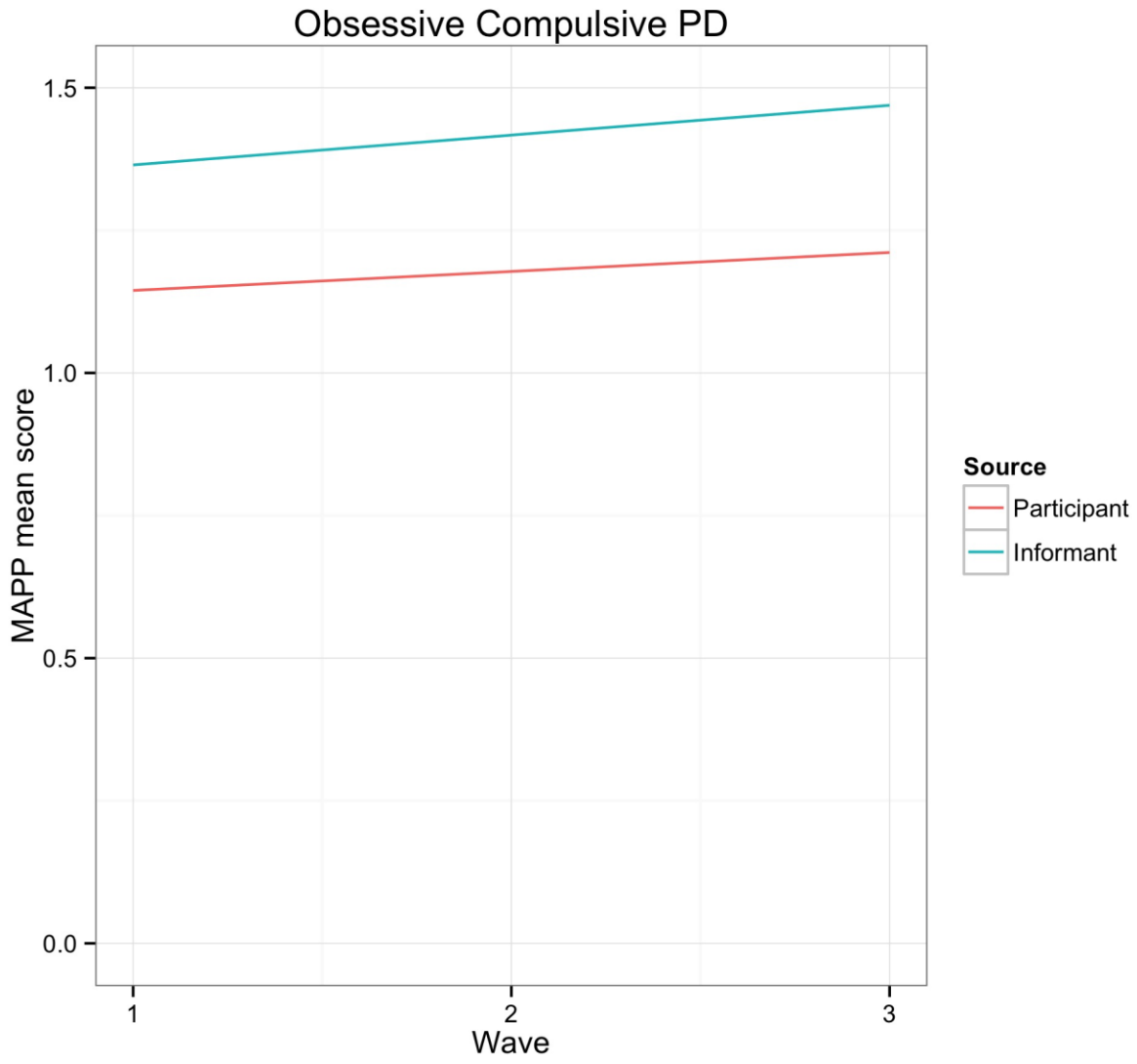

Figure 12. Obsessive Compulsive PD MAPP self- and informant- change.

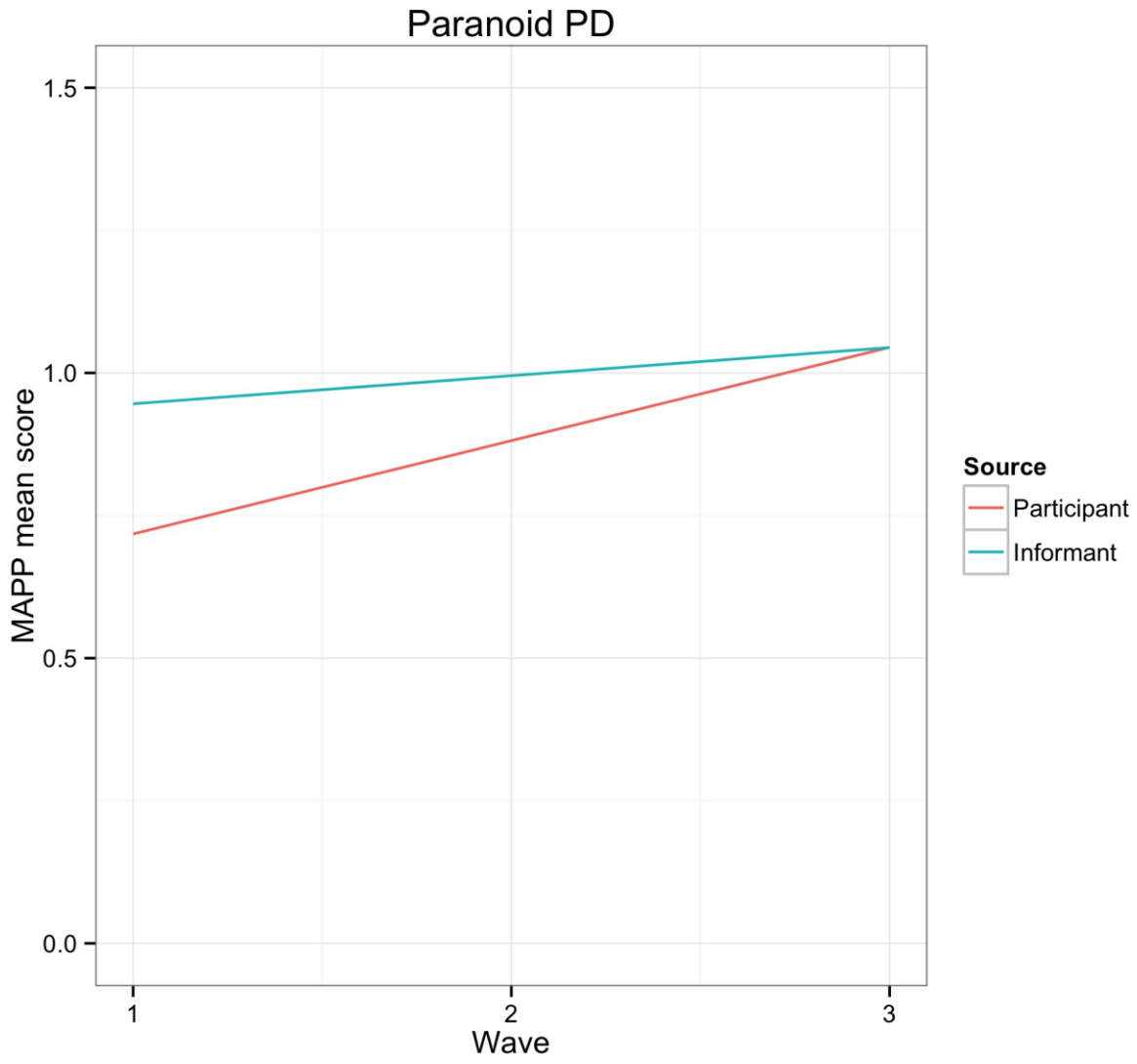

Figure 13. Paranoid PD MAPP self- and informant- change.

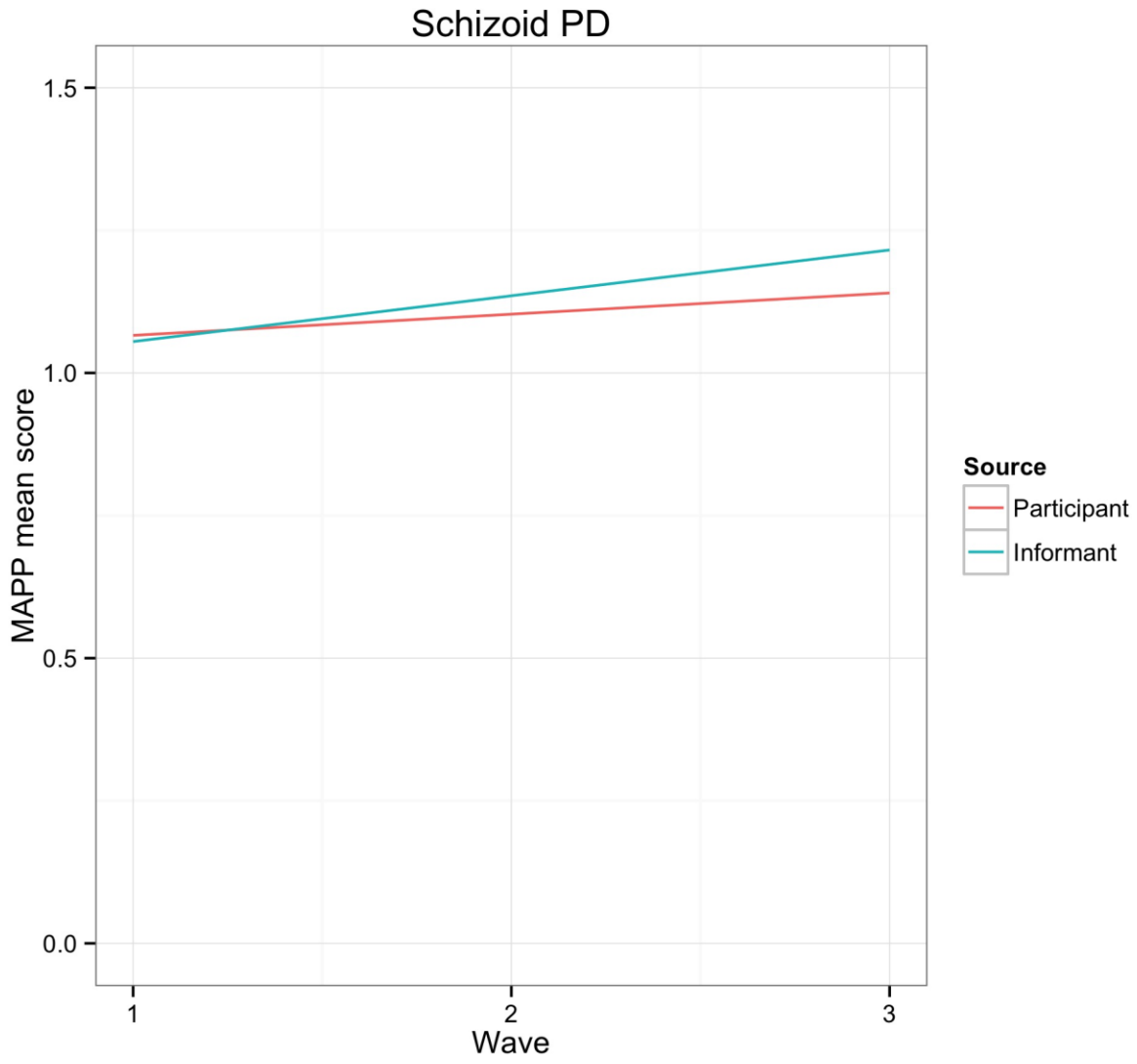

Figure 14. Schizoid PD MAPP self- and informant- change.

Table 18
MAPP correlated change (covariance of slopes)

Self	Informant Unstandardized	Informant Standardized
Antisocial	0.00	0.19
Avoidant	0.01	0.37
Borderline	0.01	0.15
Narcissistic	-0.00	-0.07
Obsessive-compulsive	0.02	0.54
Paranoid	0.01	0.15
Schizoid	0.01	0.11

Note. None of these estimates were statistically significant. The correlation of self- and informant-report of Obsessive-compulsive PD approached significance, $p = .08$.

Self- and informant-rated personality measurement invariance. Personality trait change was assessed with two types of models. In order to be consistent with the analyses above, latent growth curve modeling was conducted for each trait. In addition, second-order latent growth curve modeling was completed for the five personality traits. The main difference between these two models is that in second-order models the measures are latent to reduce measurement error, in addition to the latent intercept and slope parameters found in both types of models (Jackson & Allemand, 2014). In order to conduct a second-order latent growth curve model, measurement invariance must be shown. Measurement invariance tests were conducted on each self-reported and informant-reported personality trait. All personality traits were found to have strong longitudinal invariance, except informant-reported conscientiousness that was found to have only weak invariance (Table 19 presents model fit indices for informant-reported

conscientiousness). However, the CFI change was only 0.016 indicating that informant-reported conscientiousness was close to showing strong invariance.

Self- and informant-rated personality trait change. Table 20 shows model fit indices for the bivariate models of self- and informant personality trait change with second-order latent growth curve modeling. Model fit is acceptable for all models (RMSEA range .05- .06, CFI range .89 - .94, SRMR range .07 - .10). Table 21 shows the latent growth model estimates of the intercept and slope of each personality trait for both self- and informant-report, as well as variance estimates for each of these parameters. Figures 15 – 19 also visually show the growth curves of each personality trait. Table 21 and Figures 15 – 19 show that there are differences in initial levels of self- and informant-report of personality traits and also different patterns of change through the study. For agreeableness (Figure 15), participants rate themselves as more agreeable than do their informants, and both self- and informant-reports show stability in agreeableness over time. In terms of conscientiousness (Figure 16), informants initially rate the participants as more conscientious than the participants rate themselves, but informant-report and self-report converge over the course of the study. Specifically, there is a significant difference in the slopes of self- and informant-report; participants show stability in their ratings of conscientiousness while informant-report shows a decline in conscientiousness (slope = -.04). With regard to extraversion (Figure 17), participants and informant-report show a slight discrepancy in initial levels of extraversion with informants reporting more extraversion for the participants, but both self- and informant-report show decreases in extraversion over the course of the study (slope estimates of -.02 and -.05, respectively). However, there is a significant difference in the self- and informant- slopes; informants report a faster decline in extraversion than do the participants. For neuroticism (Figure 18), informants rate the participant as higher on

neuroticism than the participants rate themselves, and they show different patterns of change over the course of study. Self-report shows stability of neuroticism, while informant-report shows decreasing neuroticism (slope estimate = -.03), leading to a significant difference in the slope parameters. Finally in terms of openness (Figure 19), participants show higher levels of openness in self-report than informant-report, and both self- and informant-report show stability in openness.[2]

In terms of individual differences in change (also found in Table 21), all of the personality traits had significant variance in the intercept parameter, indicating that there were individual differences in initial levels of personality traits for the participants in both self- and informant-report. In terms of slope variance, self-reported extraversion and neuroticism had significant variance in the slope parameters, while all five personality traits showed significant variance in the slope parameters as assessed by informant-report. Thus, similar to the MAPP results, informant-report showed more variability in the trajectory of change over time than did self-report. Table 22 shows the unstandardized and standardized covariance of slopes for self- and informant-report of personality traits. Similar to the MAPP results, all correlated change is positive, while in contrast to the MAPP, three of the five personality disorders show significant correlations in both standardized and unstandardized coefficients. This indicates that self-report and informant-report of personality traits are significantly associated with each other.

[2] Given the similarities between the second-order latent growth models and the latent growth models, Tables 23-25 are included for reference but will not be discussed.

Table 19
Measurement invariance for informant-report NEO conscientiousness

Model	χ^2	*df*	RMSEA	SRMR	CFI	ΔCFI
Configural Invariance	637.94 *	114	0.06	0.04	0.970	-
Weak Invariance	666.84*	124	0.05	0.05	0.969	0.001
Strong Invariance	960.24*	136	0.06	0.06	0.953	0.016

Note. In the configural invariance model all latent variables are allowed to covary with the same factor structure across time.
***p* values < .001

Table 20
NEO fit indices for bivariate self- and informant-report models (Second-order models)

Model	χ^2	*df*	RMSEA	CFI	SRMR
Agreeableness	3295.14*	1148	0.05	0.92	0.07
Conscientiousness	3881.93*	1148	0.05	0.92	0.07
Extraversion	4670.74*	1148	0.06	0.89	0.10
Neuroticism	3210.44*	1148	0.05	0.94	0.07
Openness	3678.51*	1148	0.05	0.91	0.09

***p* values < .001.

Table 21

Latent growth model estimates of personality trait change (Second-order models)

		Mean		Variance	
		Self	Informant	Self	Informant
Agree.	Intercept	**2.714 (.009)**	**2.586 (.013)**	**0.061 (.004)**	**0.169 (.010)**
	Slope	-0.013 (.008)	-0.011 (.013)	0.003 (.007)	**0.037 (.016)****
Cons.	Intercept	**2.576 (.010)**	**2.655 (.015)**	**0.097 (.005)**	**0.213 (.011)**
	Slope	-0.004 (.008)***	**-0.043 (.013)*****	0.012 (.007)	**0.055 (.017)****
Extra.	Intercept	**2.243 (.010)**	**2.285 (.012)**	**0.106 (.006)**	**0.129 (.008)**
	Slope	**-0.024 (.008)*****	**-0.056 (.011)*****	**0.023 (.007)****	**0.029 (.011)****
Neuro.	Intercept	**1.488 (.012)**	**1.635 (.015)**	**0.140 (.007)**	**0.220 (.012)**
	Slope	0.016 (.011)***	**-0.036 (.014)*****	**0.025 (.011)****	**0.066 (.018)****
Open.	Intercept	**2.340 (.010)**	**2.216 (.011)**	**0.106 (.005)**	**0.107 (.006)**
	Slope	-0.010 (.007)	-0.019 (.010)	0.011 (.005)	**0.024 (.009)****

Bold = estimate is significantly different than 0. Standard errors are given in the parentheses. * negative variance should be treated as 0 variance, ** indicates that the slope variance is significantly different than 0 as tested by a model fit chi-square difference test. Intercept variances were not tested using a model fit chi-square difference test as this was not the primary research question. *** indicates the slopes of self- and informant- report are significantly different from each other.

Table 22

NEO correlated change (covariance of slopes) with second-order models

Self	**Informant** Unstandardized	**Informant** Standardized
Agreeableness	0.01*	0.60
Conscientiousness	0.01	0.21
Extraversion	0.01*	0.37*
Neuroticism	0.02*	0.46*
Openness	0.01*	0.35*

Note. The standardized informant agreeableness is not significant despite the large estimate.
******p* values < .05.

Table 23
NEO fit indices for bivariate self- and informant-report models

Model	χ 2	*df*	RMSEA	CFI	SRMR
Agreeableness	102.55*	28	0.06	0.98	0.04
Conscientiousness	106.84*	28	0.06	0.98	0.04
Extraversion	54.98*	28	0.03	0.99	0.03
Neuroticism	208.02*	28	0.09	0.96	0.04
Openness	34.12	28	0.02	1.00	0.02

Note. These are for comparison purposes to the second-order models. ***p* values < .001.

Table 24
Latent growth model estimates of personality trait change

		Mean		Variance	
		Self	Informant	Self	Informant
Agree.	Intercept	**2.713 (.008)**	**2.584 (.012)**	**0.077 (.004)**	**0.195 (.009)**
	Slope	**-0.021 (.007)**	-0.023 (.013)	0.002 (.007)	**0.046 (.017)****
Cons.	Intercept	**2.578 (.009)**	**2.655 (.014)**	**0.111 (.005)**	**0.245 (.011)**
	Slope	-0.004 (.008)***	**-0.055 (.012)*****	0.008 (.008)	**0.059 (.018)****
Extra.	Intercept	**2.252 (.009)**	**2.294 (.011)**	**0.131 (.005)**	**0.165 (.008)**
	Slope	**-0.039 (.007)*****	**-0.064 (.010)*****	**0.024 (.07)****	**0.037 (.012)****
Neuro.	Intercept	**1.488 (.011)**	**1.631 (.014)**	**0.157 (.007)**	**0.247 (.012)**
	Slope	**0.022 (.010)*****	**-0.026 (.013)*****	0.012 (.012)	**0.071 (.020)****
Open.	Intercept	**2.334 (.009)**	**2.213 (.010)**	**0.131 (.005)**	**0.131 (.006)**
	Slope	-0.011 (.007)	**-0.020 (.009)**	0.012 (.006)	**0.022 (.009)****

Note. These are for comparison purposes to the second-order models. Bold = estimate is significantly different than 0. Standard errors are given in the parentheses. * negative variance should be treated as 0 variance, ** indicates that the slope variance is significantly different than 0 as tested by a model fit chi-square difference test. Intercept variances were not tested using a model fit chi-square difference test as this was not the primary research question. *** indicates the slopes of self- and informant- report
are significantly different from each other.

Table 25
NEO correlated change (covariance of slopes)

Self	**Informant** Unstandardized	**Informant** Standardized
Agreeableness	0.01*	0.59
Conscientiousness	0.01	0.23
Extraversion	0.01*	0.35*
Neuroticism	0.02*	0.60
Openness	0.01*	0.42*

Note. These are for comparison purposes to the second-order models. ***p*** values < .05.

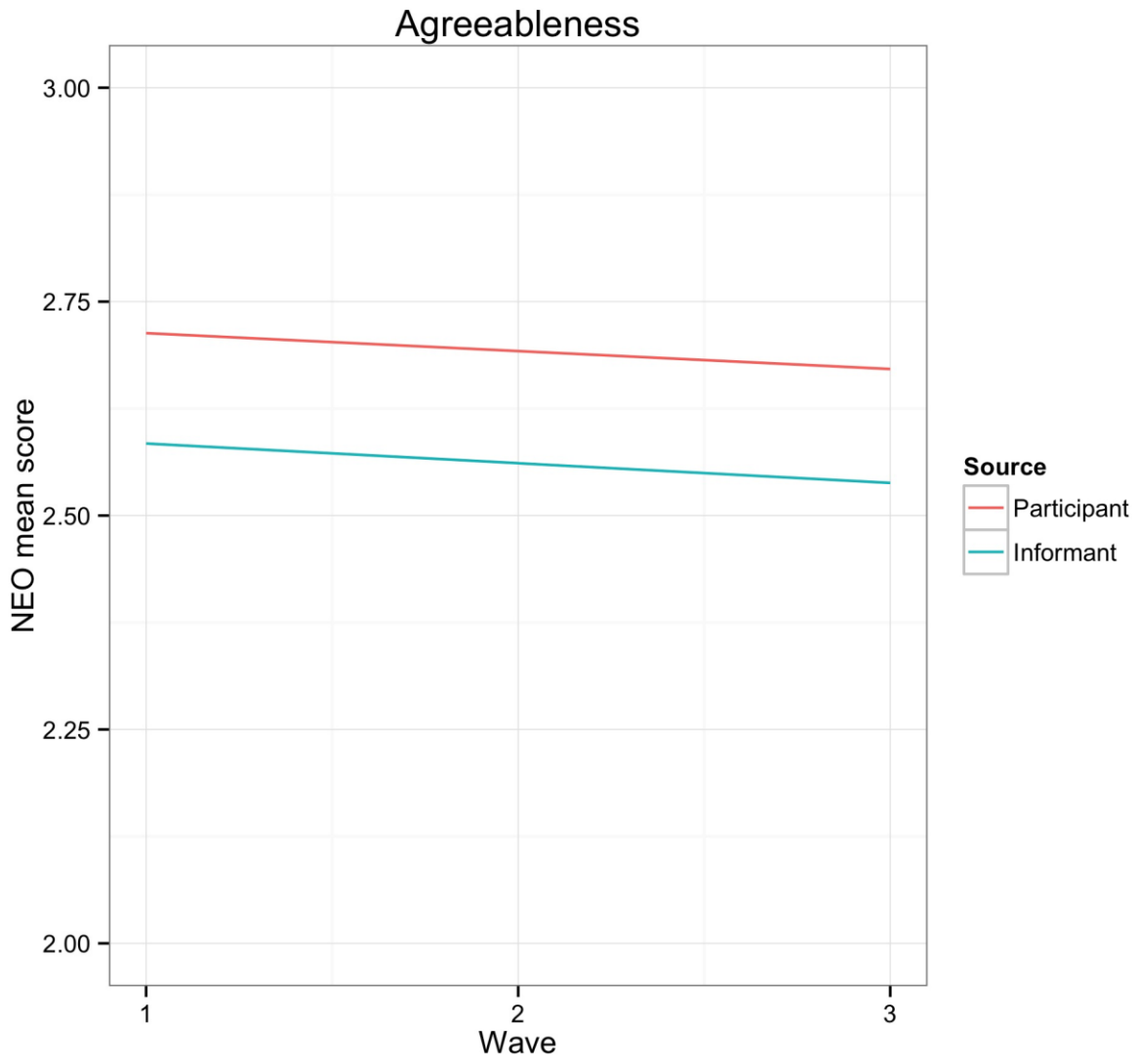

Figure 15. Agreeableness NEO self- and informant- change.

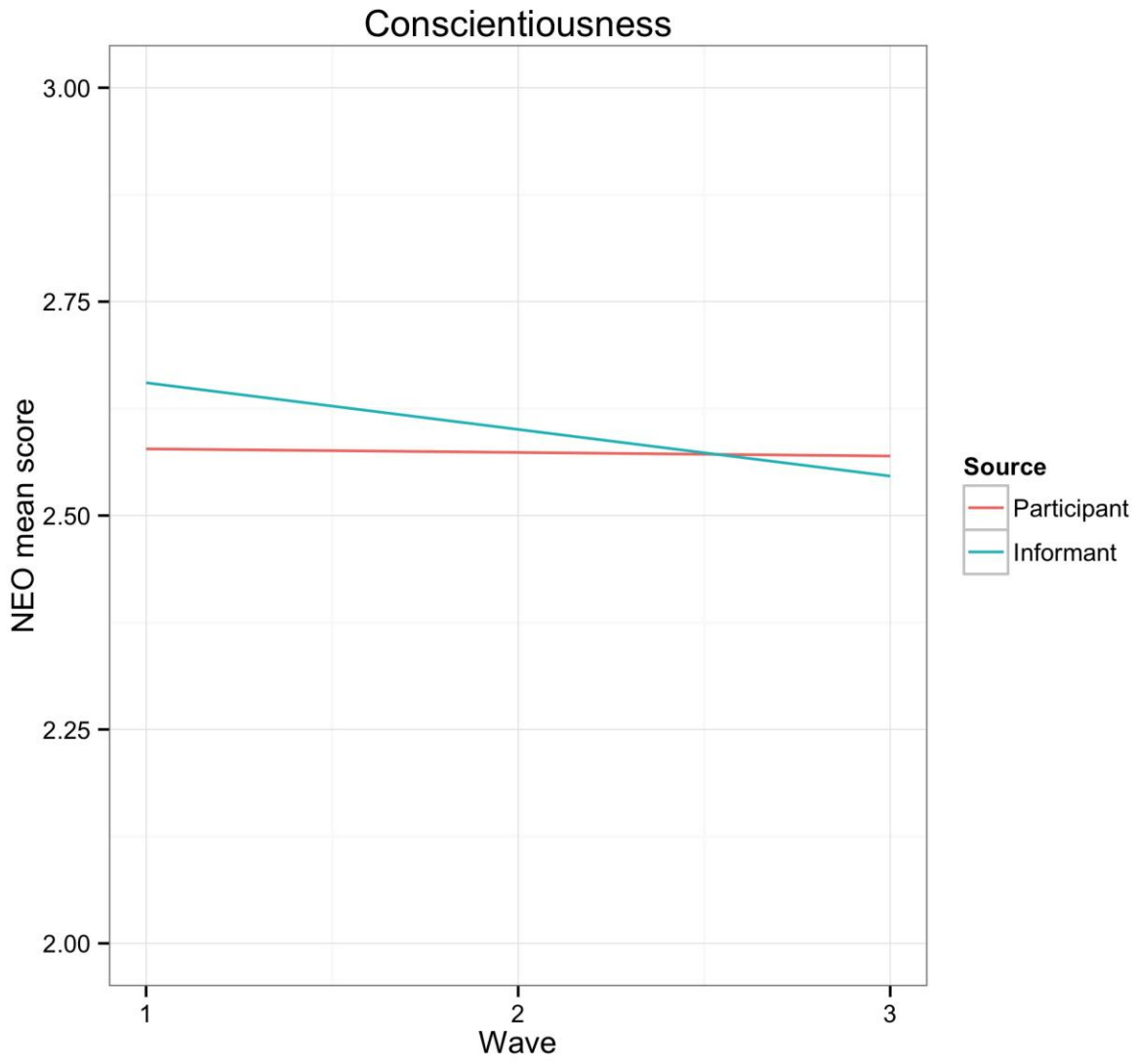

Figure 16. Conscientiousness NEO self- and informant- change.

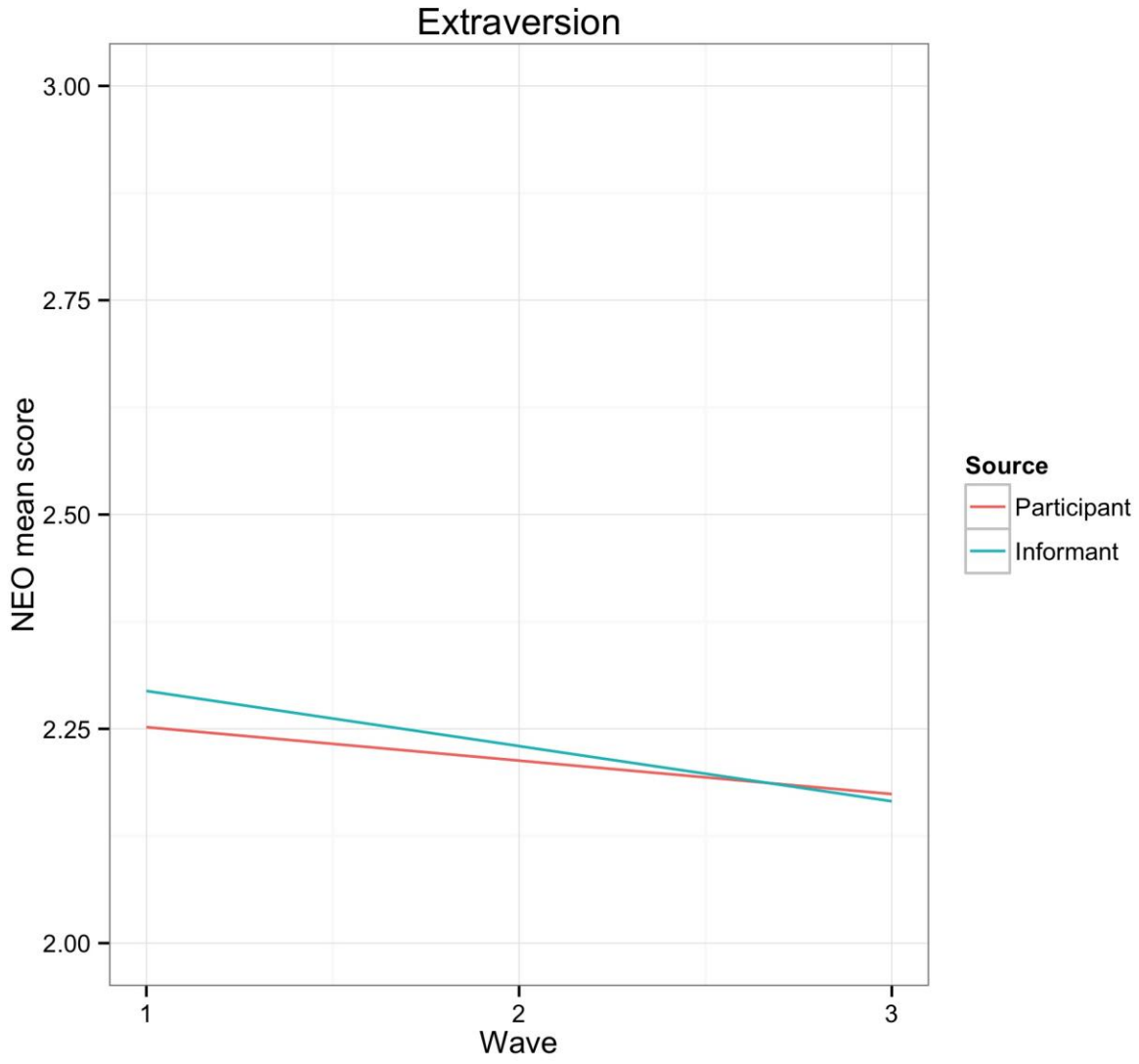

Figure 17. Extraversion NEO self- and informant- change.

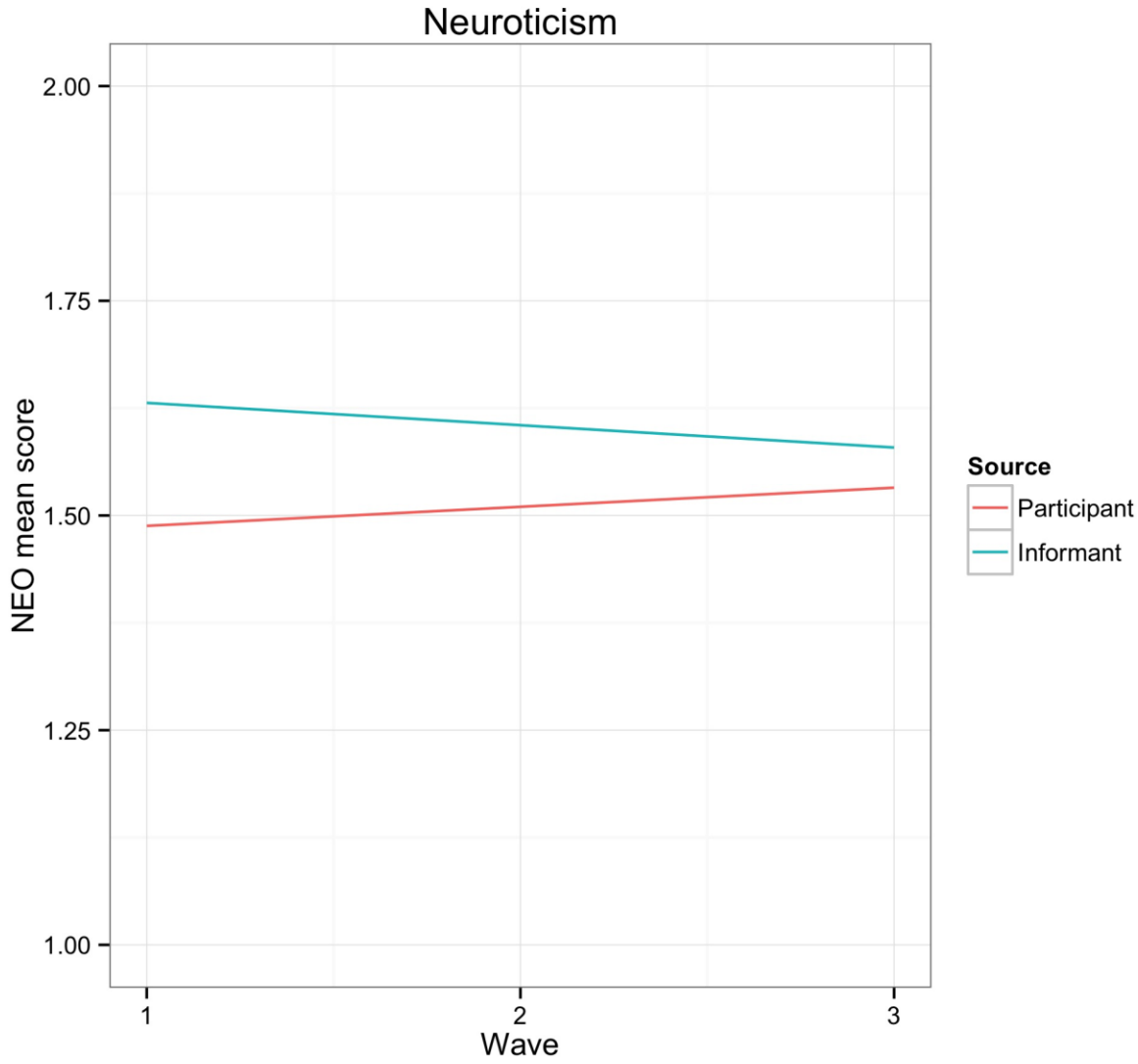

Figure 18. Neuroticism NEO self- and informant- change.

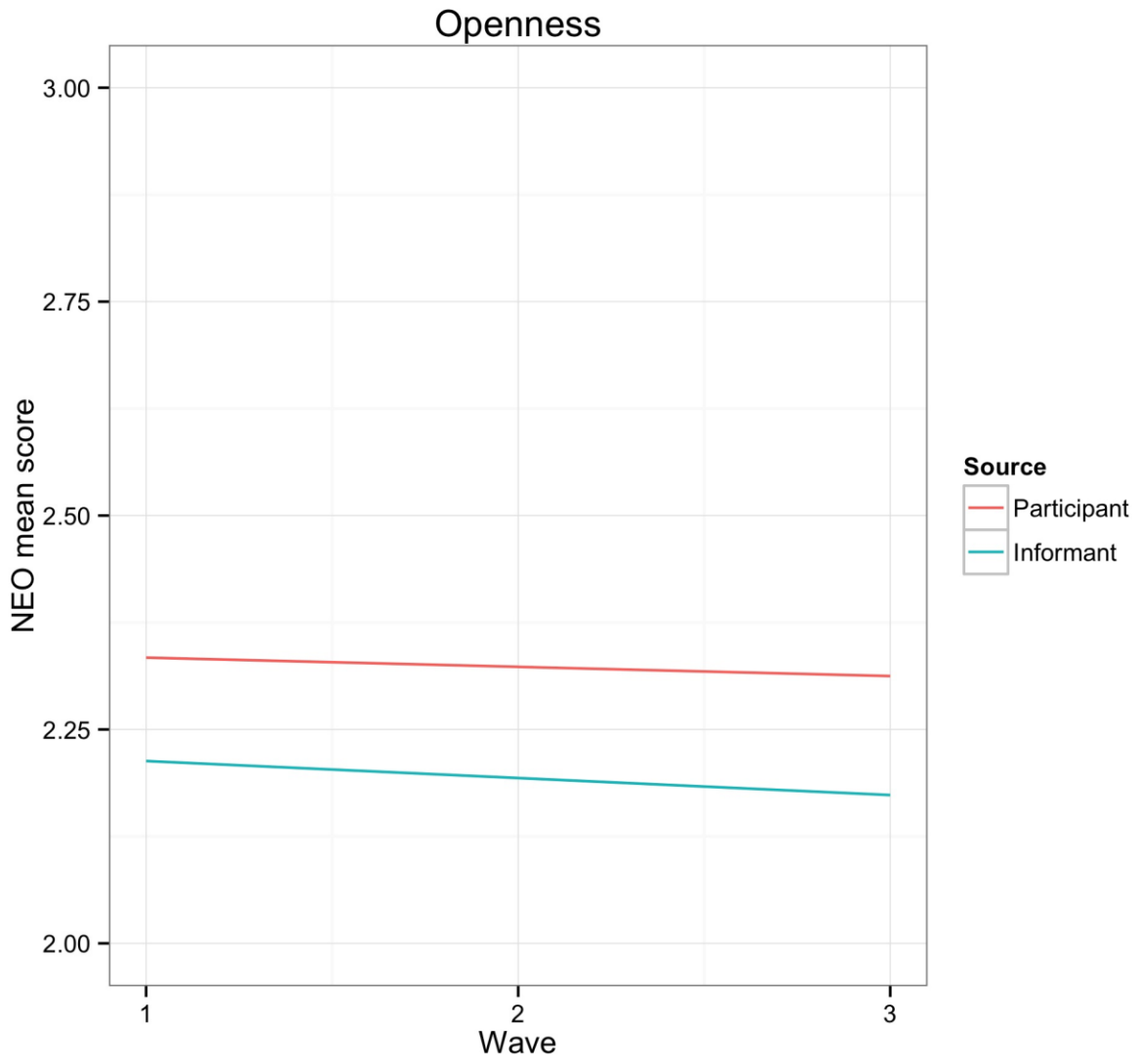

Figure 19. Openness NEO self- and informant- change.

Chapter 4: Discussion

The two main aims of this study were to examine change in personality traits and personality disorders, and to identify any individual differences in change. The unique contributions of this study are the addition of informant-reported personality and the focus on late middle age adults. The results of this study show that the direction of change, and individual differences in change, depended on the source of information: interview, self-report, or informant-report. Given the different findings for personality disorders and personality traits, these will be reviewed separately. However, even though there are differences in change between assessment measurements, all forms of report were correlated with each other and showed convergent validity and these findings will be discussed first.

4.1 The Relationship between Personality Assessments

Although not the main focus of this study, the correlations between interview, self-report, and informant-report contain a wealth of information. First, test-retest correlations provide useful information about change in this study. In fact, test-retest correlations are a common measure of rank-order consistency or stability within the field of personality (Roberts & DelVecchio, 2000). Rank-order consistency is a measure of the "relative placement of individuals within a group" (Roberts & DelVecchio, 2000, p. 4), and is distinct from mean-level changes. That is, traits can have high levels of rank-order consistency and still show mean-level changes. In our study, both personality traits and personality disorders show moderate to high levels of rank-order consistency. Our estimates of rank-order consistency for personality traits and dimensional personality disorders are comparable to other studies (Roberts & DelVecchio, 2000; Samuel et al., 2011). As these rank-order consistency estimates are not 1, we can assume that there is some

level of change in these measures. Second, these associations provide information about the convergent validity of our assessments. Our results show that each measure was significantly and positively correlated with the other measures, indicating convergent validity of our assessments. Taken together, these associations between measures show high, but not perfect, test-retest correlations and a moderate level of convergent validity, and allow us to move forward in our interpretation of the next series of change analyses.

4.2 Personality Disorder Change

As predicted, all interview-rated personality disorders decreased over the course of the study. This is consistent with previous research that has found that personality disorders decrease in longitudinal studies, with or without clinical intervention (Lenzenweger et al., 2004; Skodol, 2008; Zanarini et al., 2006). In addition, our analyses showed relatively low levels of pathology when the SIDP was the assessment measure. Low levels of interview-rated pathology are not surprising given that this was a community sample of late middle age adults in which the interviewers were trained to identify pathological levels of the symptoms with requisite functional impairment. Even the personality disorders that have been found to be more common in older adults across multiple studies, like obsessive-compulsive and schizoid personality disorder (Oltmanns & Balsis, 2011), showed decreases over the course of the study. This finding indicates that even personality disorders with symptoms that may be more common in older adults (e.g., rigidity as a symptom of OCPD) show "burnout" over time in our sample. The term burnout, in reference to personality pathology, is the idea that as adults age, pathology that was previously present begins to decrease in severity and functional impairment (Oltmanns & Balsis, 2011), and our interview-rated findings are consistent with this pattern. Contrary to our hypothesis, we did not find individual differences in the majority of interview-rated personality

disorders. Thus, individuals tended to change in the same way over the study (i.e., no significant variance in the slope parameter), except for narcissistic PD, obsessive-compulsive PD, and schizoid PD. Of note, a lack of individual differences in change does not mean that no individual showed a different pattern of change. Instead, it means that the majority of individuals followed the general trend.

Self- and informant-report of personality disorders as assessed by the MAPP primarily showed increases in pathology, except for informant-reported antisocial PD and narcissistic PD that showed no change. Although the direction of change was similar for self- and informant-report, our analyses showed that informants reported higher levels of pathology than did participants at wave 1 for most personality disorders. This is consistent with a previous study that used item response theory analyses and found informants report narcissistic personality features at lower levels than participants do (Cooper et al., 2012). Even so, our findings contradicted our hypotheses in two important ways. First, we expected self-reported personality pathology to be consistent with interview-rated pathology and to show decreases over the course of the study. Second, given the results of Cooper et al. (2014), we expected self- and informant-reports to be discrepant. Interestingly, the only significant difference in change between self- and informant-report we found was with paranoid personality disorder. This significant difference was the result of a discrepancy in rate of change and not direction of change. One explanation for the inconsistency in results between our study and Cooper et al.'s (2014) study is that their results may have been a result of not accounting for initial differences in the levels of pathology reported by self- and informant-report. In addition, their study only had access to two waves of data to analyze. In terms of individual differences, contrary to our hypothesis but consistent with interview-rated PDs, self-reported pathology showed few individual differences in change. In

contrast, informant-reported pathology did show evidence for individual differences in the slope parameter, indicating that informant-report was more likely to vary from the mean-level estimate. Also contrary to our predictions, there were no significant correlations between the slope variance estimates of self- and informant-report. However, given the lack of individual differences in slope this finding is expected.

In sum, our hypothesis that there would be more discrepancy between change estimates for self- and informant-report was inaccurate. Self- and informant-report actually showed agreement in the direction of change over the course of the study. In fact, the main difference in the direction of change was between the interview-rated assessment and the other two assessment measures. Although this was contrary to our prediction, and little research has been done on self-reported change in personality pathology, there is some evidence to suggest that self-report questionnaires and semistructured interviews differ on mean-levels of stability for dimensional PD scores (Samuel et al., 2011). As noted by Samuel et al. (2011), there are many reasons why interviews and self-reports of personality pathology may be discrepant including increased error variance in interview assessment due to different interviewers at each assessment time. The characteristics of an interview assessment are also different than self-report (or informant-) measures. Interviewers are trained to assess for pathological levels of a specific symptom with multiple questions whereas participants are asked to report how often they are "like this" in response to one question per symptom. Extrapolating from reasons why self- and informant-report may differ, self- and interview may also differ on factors like access to information, motivation, and a tendency to use overall evaluative judgments (Beer & Watson, 2008). These identified differences in the characteristics of interview and self-report suggest that these two assessments may be measuring different conceptualizations of personality pathology.

One explanation for this discrepancy is that self- (or informant-) report of personality pathology is picking up on more trait-like personality disorder symptoms with or without impairment, whereas interview assessment is picking up on "true" maladaptive symptoms.

4.3 Personality Trait Change

For personality traits, we predicted that self-report would show normative personality development (i.e., continued maturity), and again anticipated that self- and informant-reports of personality traits would differ. These hypotheses were only partially supported. Self-reported personality primarily showed stability in trait levels, except for the trait of extraversion that showed a decrease. Extraversion has been shown to decrease in older adults and this result is consistent with normative personality development (Specht et al., 2011; Wortman et al., 2012). Self- and informant-report showed the smallest discrepancy on the trait of extraversion, and this supports the idea that traits with high observability will show the most agreement between different forms of self-report (Vazire, 2010). The data did not support our hypothesis that the participants would continue to increase on agreeableness and decrease on neuroticism as assessed by self-report. Consistent with the MAPP results, there were initial differences in self- and informant-report of personality traits. These differences were only partially in line with our hypotheses. As expected, informants reported that the participants were less agreeable, more neurotic, and less open at wave 1. Surprisingly, informants reported that the participants were more conscientious than the participants rated themselves. It would be tempting to suggest that informants either had a positivity bias, or a negativity bias, but no consistent pattern emerges from this study. Also, informant-reported personality showed unexpected decreases in neuroticism and expected decreases in conscientiousness throughout the study. Conscientiousness and extraversion evidenced a crossover of self- and informant-report

indicating that self- and informant-perspectives became more similar over the course of the study. Taken together, no clear pattern emerged across the traits to support our hypothesis that self-report would show positive and normative development, whereas informant-report would show a different trend. Potential reasons that explain these findings are an important area for future study.

In terms of individual differences in personality trait change, the results were again consistent with the MAPP results. Partially supporting our hypothesis, all personality traits showed evidence for individual differences in informant-report whereas only self-reported extraversion and neuroticism had individual differences in slope. These results indicate that there is more variability in the slope estimate for informants (i.e., more deviation from the mean-level trends). It is somewhat surprising to not find individual differences in self-reported agreeableness and conscientiousness, as these traits are associated with common events in the lives of late middle age adults like health changes and retirement (Mike, Jackson, & Oltmanns, 2014; Turiano et al., 2012). In contrast to the MAPP, we did find significant correlated change within the NEO personality traits. Specifically, the slope variances of self- and informant-reported extraversion, neuroticism, and openness were associated. That is, at the individual change level there was agreement between self- and informant-perspectives.

4.4 Limitations, Future Directions, and Conclusions

Although these results are an important first step in understanding the course of personality pathology and personality traits in late middle age, it is outside the scope of this paper to answer two important questions. First, are these changes clinically significant? That is, are these changes noticeable (and if so, to whom are they noticeable) and do they predict important outcomes? When thinking about this question it is critical to remember that the

participants, informants, and interviewers in this study were not asked to assess "changes" in personality. They were instead asked to report on current personality and personality pathology at three different assessment points. Thus, even though we found mean-level changes in personality and personality disorders, it does not mean that the self or the informant would be able to notice or reflect on the change. In fact, that is an entirely separate question that can (and should) be empirically tested. Would an individual who changed more than the mean-level trend be able to identify his or her change? For example, if a participant is more concerned about being a burden to loved ones after the onset of an illness would she be able to identify that she has changed on the item "I prefer to do things alone." Would her informant also notice this change? These are very important questions that are ripe for future study. Although the issue of clinical significance of change is not addressed in this study, past research has shown that small changes can be clinically significant even with an important outcome like mortality (Mroczek & Spiro, 2007).

Second, if assessment measures are discrepant, which one is "correct?" In terms of personality disorders, should we put more weight on interview-rated assessment – the gold standard of personality disorder assessment? What does it mean about the utility of the interview-rated assessment when it is discrepant from both self- and informant-report? As noted above, one interpretation of these findings is that interview assessment is measuring something different than self- and informant-report. In terms of which assessment is correct, does it matter which outcome is of interest? For example, different sources of report can be meaningful for different types of outcomes, like in the case of peer reports predicting early discharge from the military (Fiedler et al., 2004). If there are differences in the direction of change for these assessments, is it meaningful to aggregate the sources of information to predict outcomes? A

recent study, using the same sample as ours, used principal components analysis to compute a component score of borderline personality disorder from interview assessment, self-report, informant-report, and NEO personality count scores of BPD in order to study the relationship between borderline personality disorder, work status, and health (Cruitt, Boudreaux, Jackson, & Oltmanns, 2016). These are important questions that can be answered with future studies that include multiple sources of report as well as well as the ability to study important life outcomes.

Another logical next step of this research is to identify events that may contribute to changes in both personality and pathology. As noted above, environmental factors may have an impact on personality development across the lifespan and the SPAN study has the potential to be examined for a wide variety of variables that may lead to change. Retirement, the onset of illness, death of a close relative, and caretaking of grandchildren could all be important life events related to personality development. More than three assessment points would also be helpful to identify whether personality and personality pathology return to a set point after life events or if personality continues to develop in the same way. Furthermore, recent research has focused on the relationship between trait change and personality pathology change and has explored whether these two personality constructs change in parallel (Wright, Hopwood, & Zanarini, 2015; Wright et al., 2011; Wright, Pincus, & Lenzenweger, 2013). A natural extension of this work would be to study the trajectories of personality traits and personality pathology in the same models.

This study examined mean-level and individual differences in change for personality disorders and personality traits. Uniquely, this study used three different assessment measures to analyze change and focused on late middle age adults. We found that interview-rated personality disorders show decreases in pathology whereas self- and informant-report show stability or

increases in pathology. Personality traits did not follow a consistent trend, although both self- and informant-report showed that extraversion was decreasing. Contrary to expectations, we found little evidence for individual differences in interview-rated or self-report, and more evidence for individual differences in informant-report. Taken together, personality research would benefit from taking into account more sources of information when studying personality change.

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