

ORIGINAL ARTICLE

Self–other personality agreement and internalizing problems in adolescence

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Abstract

Objective: Achieving a clear self-view is a lifelong task that is particularly salient during adolescence. Theory and research suggest that close others' perceptions of individuals' personality may influence the formation and maintenance of coherent self-views. The degree to which adolescents develop a stable and coherent self-view, in turn, may have perennial influences on their mental health and well-being. This 1-year longitudinal study investigated the associations between the agreement of self- and other-rated Big Five personality traits and internalizing problems in adolescence.

Method: Participants were 570 Dutch adolescents (51% girls), their mothers, friends, and siblings. We examined the cross-sectional and longitudinal associations between self–other personality agreement and internalizing problems using polynomial regression analyses and response surface analyses.

Results: Results indicated strong main effects of self- and other-rated personality traits on internalizing problems but provided little evidence for longitudinal associations between self–other personality agreement and internalizing problems.

Conclusion: Our results cast doubt on the generalizability of the beneficial effects of self–other agreement documented in the adult literature to adolescents but highlight the importance of self- and other-rated personality in youth's mental health development. Discussion focuses on the theoretical implications and recommendations for future investigations of self–other agreement.

KEYWORDS

adolescence, internalizing problems, personality, self–other agreement

1 | INTRODUCTION

An important developmental task in adolescence involves the development of a clear and stable self-view (Erikson, 1994; Harter, 2007). Successful mastery of this task has been associated with psychological adjustment and mental health, whereas failures to develop a stable and coherent identity have been related to maladjustment and

developmental problems (Bleidorn & Ködding, 2013; Cooley, 1902; Harter, 2007). A significant aspect of successful identity development is a coherent idea of one's own personality. To develop a coherent self-view, adolescents not only observe their behaviors, thoughts, and feelings but also internalize personality-relevant feedback from others (Campbell, 1990; Campbell & Lavalley, 1993; Cooley, 1902; Donahue, Robins, Roberts, & John, 1993; Erikson,

1994; Harter, 2007; Mead, 1934; Srivastava, 2012; Swann & Bosson, 2008; van Dijk et al., 2014). Confusion and uncertainty may therefore arise when close others perceive adolescents' personality in a different way as how adolescents perceive themselves. In contrast, self–other personality agreement may facilitate identity development, which in turn could buffer adolescents from developing internalizing problems. Besides this *epistemic* benefit of self–other personality agreement for the target individuals (i.e., psychological coherence), theories have also proposed some *pragmatic* benefits such as facilitating effective communication and collaboration (Kwang & Swann, 2010; Swann, De La Ronde, & Hixon, 1994).

Cross-sectional research on adult samples has found positive links between self–other personality agreement and psychological adjustment (for a review, see Human & Biesanz, 2013). However, we know little regarding whether and to what degree the positive implications of self–other personality agreement may generalize to samples of adolescents. Moreover, agreement and disagreement can manifest in multiple ways (e.g., positive vs. negative self- or other-views may have different implications for adolescents' adjustment). Past research on self–other agreement has typically relied on methods that may produce inaccurate or incomplete results regarding the implications of self–other agreement at different levels of the personality measures such as difference scores or regression residuals (cf. Barranti, Carlson, & Côté, 2017). The purpose of the present study was to address this and other limitations of past approaches by examining the degree to which self–other personality agreement is associated with internalizing problems in adolescence, using response surface analysis (RSA) and 1-year longitudinal data from 570 Dutch adolescents and their parents, siblings, and friends.

1.1 | Self–other personality agreement and mental health

Theory and research on adults have shown that people prefer to be known and understood by others according to how they see themselves (Bleidorn et al., 2016; Edwards et al., 1999; Harms, Roberts, & Winter, 2006). For example, self-verification theory (Swann, 2012) asserts that people strive to be seen by their close others in the same way as they see themselves, even when their self-views are negative. Such strivings are supposed to provide stability making individual's social experiences more coherent, orderly, and comprehensible than they would be otherwise (Kwang & Swann, 2010; Swann, 2012). Research on the correlates of self–other personality agreement has found self–other personality agreement to be related to various positive outcomes including better mental health, well-being, and stress regulation (Ayduk, Gyurak, Akinola, & Mendes, 2013; for a review, see Human & Biesanz, 2013).

Self-verification theory includes some boundary conditions that outline certain conditions in which strivings for self-verification may be largely attenuated if not vanished. For instance, Swann and Buhrmester (2012) proposed that *self-view certainty and accessibility* may play important roles in the effects of self–other agreement. Specifically, feedback that contradicts one's self-view might be experienced as more threatening to the degree that it is perceived as challenging a certain and accessible self-view thereby questioning their life narratives and identity (McAdams & Pals, 2006). Consistent with this notion, lower self–other agreement has been shown to have fewer negative consequences for those individuals whose self-views are relatively uncertain or inaccessible (Swann & Buhrmester, 2012).

In summary, the literature on self–other agreement suggests that there are psychological benefits of high self–other personality agreement in adulthood, although in some cases these benefits may be attenuated. We know little regarding whether and to what degree the psychological benefits of self–other agreement may generalize to adolescents. This apparent lack of research is surprising given that this life stage has been argued to be particularly relevant for the development of a stable and coherent self-view (Erikson, 1994; Harter, 2007). Extant theories and research yielded different predictions regarding the implications of self–other agreement on mental health in adolescence, which we discuss next.

1.2 | Perspectives on the implications of self–other agreement in adolescence

Different theoretical perspectives have come to divergent predictions regarding the importance of self–other personality agreement for psychological adjustment in adolescence. On the one hand, low versus high self–other agreement may have similar implications for adolescents as observed in adult samples. In fact, it has been argued that adolescence is characterized by heightened self-reflections and need for clarity (Harter, 2007). As such, adolescence may be especially vulnerable to the negative implications of low self–other agreement.

On the other hand, it has been argued that adolescents are not yet fully committed to a stable self-view (Erikson, 1994), and may be therefore less vulnerable to incongruent perceptions of their personalities (Swann & Buhrmester, 2012). Given that adolescents' self-views are on average less crystallized and stable than adults' self-views (Luan, Hutteman, Denissen, Asendorpf, & van Aken, 2017; Meeus, van de Schoot, Keijsers, Schwartz, & Branje, 2010), incongruent personality feedback may thus be less threatening to adolescents than to adults.

Moreover, the magnitude of self–other agreement appears to differ across *relationship dyads* (e.g., Kwang & Swann, 2010). In particular, intimacy and relationship quality have

been found to moderate the level of self–other personality agreement (Connelly & Ones, 2010; Watson, Hubbard, & Wiese, 2000). Although past studies have typically focused on adult samples, similar trends can be expected for adolescents and close others such as family members and friends. For example, parents and siblings may have access to a relatively broad range of adolescents' personality-relevant behaviors and, to a lesser degree, also their thoughts and feelings (Connelly & Ones, 2010; Jenkins & Dunn, 2009; Luan, Poorthuis, Hutteman, Denissen, et al., 2018). Over the course of adolescence, peers may become increasingly important and gain access to relevant information that may be hidden to parents and siblings (Borghuis et al., 2017; Frijns, Keijsers, Branje, & Meeus, 2010; Koepke & Denissen, 2012). To capture potential differences across relationship dyads, we examine the implications of adolescents' agreement with their parents, friends, and siblings.

Existing research provided indirect results concerning the implications of self–other personality agreement in adolescence. One exception is a recent study by Luan and colleagues who have found some support for a positive association between self–parent (but not self–friend) personality agreement and self-esteem development (Luan, Poorthuis, Hutteman, Asendorpf, et al., 2018). However, as the authors pointed out, this study used a person-centered approach and operationalized agreement as personality profile agreement (Luan, Poorthuis, Hutteman, Asendorpf, et al., 2018), which may obscure more nuanced associations between outcome variables and different traits or levels of agreement. To our knowledge, no study to date has adopted a variable-centered approach to examine the implications of agreement on adolescent Big Five personality traits (John, Naumann, & Soto, 2008).

The person-centered (profile) approach and variable-centered (trait) approach address related but distinct questions about self–other agreement (Back & Nestler, 2016; Bleidorn, Kandler, Riemann, Angleitner, & Spinath, 2012; Borkenau & Leising, 2016; Connelly & Ones, 2010). Profile correlations capture agreement regarding the relative importance of traits within individuals but are not suited to address questions concerning the relevance of self–other agreement on specific personality trait domains. In the present paper, we adopted a variable-centered approach and RSA to address the latter type of question. We evaluated the two aforementioned perspectives on self–other personality agreement and psychological adjustment in adolescence across different *relationship dyads* and *personality traits*. Moreover, adopting RSA allowed us to examine the correlates of self–other agreement across different levels of different trait dimensions and address several methodological challenges associated with traditional approaches that were not designed specifically for studying agreement. We next turn to these methodological considerations.

1.3 | Methodologies for studying agreement effects

The operationalization of self–other personality agreement has been the subject of long-standing debate (Wood & Furr, 2016). Recently, studies in personality and social psychology have begun to use polynomial regression in combination with RSA to address questions about the implications of congruence versus incongruence in personality ratings (e.g., Bleidorn et al., 2016; Denissen et al., 2018; Franken, Laceulle, van Aken, & Ormel, 2017; van Scheppingen, Chopik, Bleidorn, & Dennisen, 2018). RSA provides more accurate answers to more nuanced questions by assessing different forms of self–other (dis)agreement (e.g., congruently positive vs. congruently negative views) while reducing statistical biases and interpretation problems associated with traditional approaches (Barranti et al., 2017; Edwards & Parry, 1993; Shanock, Baran, Gentry, Pattison, & Heggstad, 2010).

Specifically, RSA allows researchers to study (dis)agreement effects without the need to firstly transform the self- and other-reports into difference scores or regression residuals (Edwards, 1994, 2007). These latter, more traditional approaches are problematic because they involve untested assumptions (Cronbach, 1958; Edwards, 1994; Nestler, Humberg, & Schönbrodt, 2018). For example, difference score approaches assume that there are no linear main effects of self- and other-rated personality (i.e., $b_{\text{self}} = b_{\text{other}} = 0$), and their quadratic main effects are identical (i.e., $b_{\text{self}}^2 = b_{\text{other}}^2$).

To address this problem, RSA explicitly tested these assumptions by including linear and quadratic main effects of self- and other-ratings, in addition to their interaction in the model (Edwards, 1994; Shanock et al., 2010). This benefit of RSA is particularly relevant for the present study given the large body of evidence regarding main effects of self- and other-rated personality traits (especially Extraversion and emotional stability) on mental health and well-being outcomes (e.g., De Pauw & Mervielde, 2010; Luan, Poorthuis, Hutteman, Denissen, et al., 2018; Ozer & Benet-Martínez, 2006; Tackett, 2006). In addition to its less strict assumptions, the visualization of the results in RSA plots allows for a more comprehensive examination of self–other agreement, for instance, regarding whether agreement is more or less beneficial at high versus low levels of Extraversion, Emotional Stability, Openness, Agreeableness, or Conscientiousness.

1.4 | The present study

In this study, we examined whether adolescents' agreement with close others regarding their Big Five personality traits were associated with internalizing problems concurrently and 1 year later, using multi-informant longitudinal data and state-of-the-art RSA techniques. Using this approach, we hoped to achieve more accurate and nuanced answers to the

question whether and how agreement between adolescents and various close others (i.e., parents, friends, and siblings) is related to psychological adjustment.

To test the two perspectives stated above, we investigated both cross-sectional and longitudinal associations between self–other personality agreement and internalizing problems. Based on past research on the association between personality and internalizing problems (De Pauw & Mervielde, 2010; Tackett, 2006), we expected to find main *cross-sectional* effects of self- and other-rated personality on internalizing problems, especially for Emotional Stability and Extraversion, because current evidence is most consistent regarding these traits (Tackett, 2006). In addition, we explored the *longitudinal* association between self–other personality agreement and internalizing problems 1 year later, while controlling for baseline internalizing problems.

2 | METHOD

2.1 | Participants and procedure

Participants were 570 adolescents from 288 Dutch families with both parents and at least two adolescent children. These data were part of a larger project (the longitudinal Family and Personality Research Project; Haselager & van Aken, 1999). A representative selection of 23 municipalities throughout the Netherlands provided lists of families with at least two adolescents between 11 and 16 years old. After sending a letter announcing the study, interviewers called families and invited them to participate, to which 50% of the contacted families agreed. The majority of the respondents were of Dutch origin—in 4% of the families, parents reported that they were not born in the Netherlands (compared with 9% of the general Dutch population; Central Intelligence Agency, 2006).

The 288 families completed three annual home interviews with trained interviewers. At each measurement wave, interviewers asked mothers, fathers, and adolescents to each independently complete a questionnaire battery. Additionally, at the second wave, interviewers asked each family member to invite their best friend to participate in the study. These friends were instructed to complete the questionnaire at home and send it back by mail.

For the present investigation, we used data from the second and third waves (here referred to as T1 and T2, collected in 1999 and 2000, respectively) because friend reports were only available at the second assessment wave. For each target adolescent, we used self-, mother-, sibling-, and friend-reported Big Five personality traits at T1 ($n = 570, 568, 568,$ and $344,$ respectively) and examined whether and how the agreement on personality traits was associated with adolescent self-reported internalizing problems assessed at T1 and T2.

Most families participated throughout the course of the study, with 285 families (99%) providing self- and

other-reported data at both T1 and T2. Ninety-nine percent of the families provided complete data on the research variables at T1, and 98% at T2. Attrition analyses showed that, compared to adolescents with complete data ($n = 337$), those with missing data ($n = 239$) were more likely to be boys (95% confidence interval: $[0.53, 0.64]$ vs. $[0.35, 0.48]$). There were no group differences in personality or internalizing problems.

Power analysis for RSA is not straightforward. Following previous studies (e.g., Denissen et al., 2018), we used the sample size and the number of predictors to calculate the statistical power of polynomial regression analyses. Results indicated that the present sample size allowed us to detect small effects in polynomial regressions with six predictors ($f^2 = 0.023$ for self–parent and self–sibling agreement; $f^2 = 0.038$ for self–friend agreement) with the power of 0.80.

At T1, adolescents and siblings were on average 14.50 years old ($SD = 0.80$), best friends were on average 14.41 years old ($SD = 1.18$), and mothers were on average 42.70 years old ($SD = 3.25$). After completing each measurement wave, target adolescents were reimbursed with a CD gift certificate worth approximately 6.80 Euros. If they provided a friend report, both target adolescents and their friends received an extra CD gift certificate. As an additional incentive, a lottery was organized in which 10 families could win a travel voucher of about 900 Euros.

2.2 | Measures

2.2.1 | Personality

At T1, adolescents' Big Five personality traits were rated by adolescents themselves, their mothers, siblings, and best friends via the Dutch adaptation (Gerris et al., 1998) of the 30 adjective personality makers (six items per trait) selected from Goldberg (1992). Sample items included “sympathetic” and “kind” for Agreeableness; “talkative” and “reserved” (reverse coded) for Extraversion; “anxious” and “nervous” (both reverse coded) for Emotional Stability; “careful” and “organized” for Conscientiousness; and “imaginative” and “creative” for Openness. Personality was rated on a 7-point Likert scale (from 1 = *very untrue of this person* to 7 = *very true of this person*). We calculated mean scores for each personality trait and each reporter (i.e., in total five traits and four reporters). Cronbach's alphas across reporters ranged from .80 to .87 for Agreeableness; from .81 to .90 for Extraversion; from .77 to .82 for Emotional Stability; from .85 to .94 for Conscientiousness; and from .68 to .86 for Openness.

2.2.2 | Internalizing problems

Adolescents reported on their internalizing problems at T1 and T2 using the subscales of anxiety/depression (five items;

such as “I feel sad and unhappy”) and withdrawal (five items; such as “I behave awkwardly in dealing with others”) of the Nijmegen Problem Behaviour List (Scholte, Vermulst, & de Bruyn, 2001), which is the Dutch adaptation of the Child Behaviour Checklist (Verhulst, van der Ende, & Koot, 1996). Participants and informants responded to the 10 NPBL items on a 5-point Likert scale (ranging from 1 = *does not apply to this person at all*, to 5 = *applies to this person very well*). We computed a mean score for internalizing problems for each wave. Cronbach's alphas were .85 and .87, respectively.

2.3 | Analytic strategy

Data were analyzed using the RSA package (Schönbrodt & Humberg, 2017) in the statistical software R (R Core Team, 2017). We used polynomial regression analyses and RSA to test the joint impact of self- and other-rated Big Five personality traits on adolescents' internalizing problems both *cross-sectionally* and *longitudinally*. Specifically, we first examined the cross-sectional associations between internalizing problems and self–other personality agreement at T1. Afterward, we explored whether self–other personality agreement at T1 predicted *changes* in internalizing problems from T1 to T2.

Each type of self–other agreement (self–mother, self–sibling, and self–friend) and each Big Five personality trait were modeled separately. To reduce the false positive rate, we considered findings with $p < .005$ (two-tailed) as significant, and findings with $.005 < p < .05$ as suggestive (Benjamin et al., 2018). To facilitate interpretation, unstandardized predictors were centered on the scale midpoint (Barranti et al., 2017; Edwards, 1994). We used multilevel modeling to account for the nested data structure with adolescents nested within families using *lme* function and maximum likelihood to compare multilevel models (Barranti et al., 2017).

To avoid overfitting the data, for each self–other dyad and for each trait, we compared the following three models using the Akaike Information Criterion (AIC). A significant model-fit improvement was indicated by a decrease of AIC that was larger than 2 (Burnham & Anderson, 1998). We only examined agreement effects in the RSA surface when model comparison tests indicated that the full RSA model fit the data best.

2.3.1 | Model 1: Internalizing problems predicted by covariates

For cross-sectional analyses, we controlled for age and gender of adolescents. For longitudinal analyses, we controlled for age, gender, and internalizing problems at T1. Results without controlling for age and gender were highly similar, which we report in the online supplemental materials (see Table S2 and S3).

2.3.2 | Model 2: Internalizing problems predicted by covariates and self- and other-rated personality

Model 2 added the linear effects of self- and other-rated personality to Model 1, examining the unique predictive power of adolescent self- and other-rated personality.

2.3.3 | Model 3: Internalizing problems predicted by covariates, self- and other-rated personality, and personality agreement

To examine the role of self- and other-rated personality and personality agreement, Model 3 added the polynomial regression coefficients to Model 2 (see equation 2). In addition to the linear effects of self- and other-rated personality (i.e., $b1$ and $b2$), Model 3 further estimate three second-order terms—quadratic effects of self- and other-rated personality (i.e., $b3$ and $b5$) and an interaction effect between the linear effects of self- and other-reports (i.e., $b4$). These three second-order terms collectively reflect agreement effects, which can be examined with RSA.

When justified (i.e., when the full RSA model fit the data best), results from the polynomial regression analyses were used to construct a three-dimensional response surface (see Figure 1a), with the two horizontal axes representing self- and other-rated Big Five personality traits, respectively. The vertical axis represented the predicted internalizing problems (Edwards, 2007). In addition, coefficients from the polynomial regression analyses ($b1$ – $b5$) were transformed to five RSA parameters $a1$ – $a5$ ¹ (Nestler, Humberg, & Schönbrodt, 2018; Shanock et al., 2010). We next explain each of the RSA parameters in relation to three key features of the response surface: the Line of Congruence, the Line of Incongruence, and the First Principal Axis.

The Line of Congruence (LOC) represented the blue line on the response surface running from the front corner to the back corner. This diagonal contains all congruent combinations (i.e., self-ratings = other-ratings), such that self- and other-rated personality are congruently high or low in a trait. *The Line of Incongruence (LOIC)* represented the other blue line running from the left corner to the right corner. This diagonal contains all combinations where self- and other-rated personality are equal in magnitude but opposite in sign (i.e., self-ratings = other-ratings). The midpoint of the LOIC, where the LOIC crosses the LOC, reflects perfect self–other personality agreement. Moving away from this midpoint on the LOIC in either direction decreases self–other agreement. RSA parameters $a3$ and $a4$ determine the shape of the LOIC, while $a1$ and $a2$ determine the shape of the LOC.

Specifically, personality agreement effects should be reflected in a curvilinear slope of the LOIC, which is indicated by RSA parameter $a4$. In the example Figure 1a,

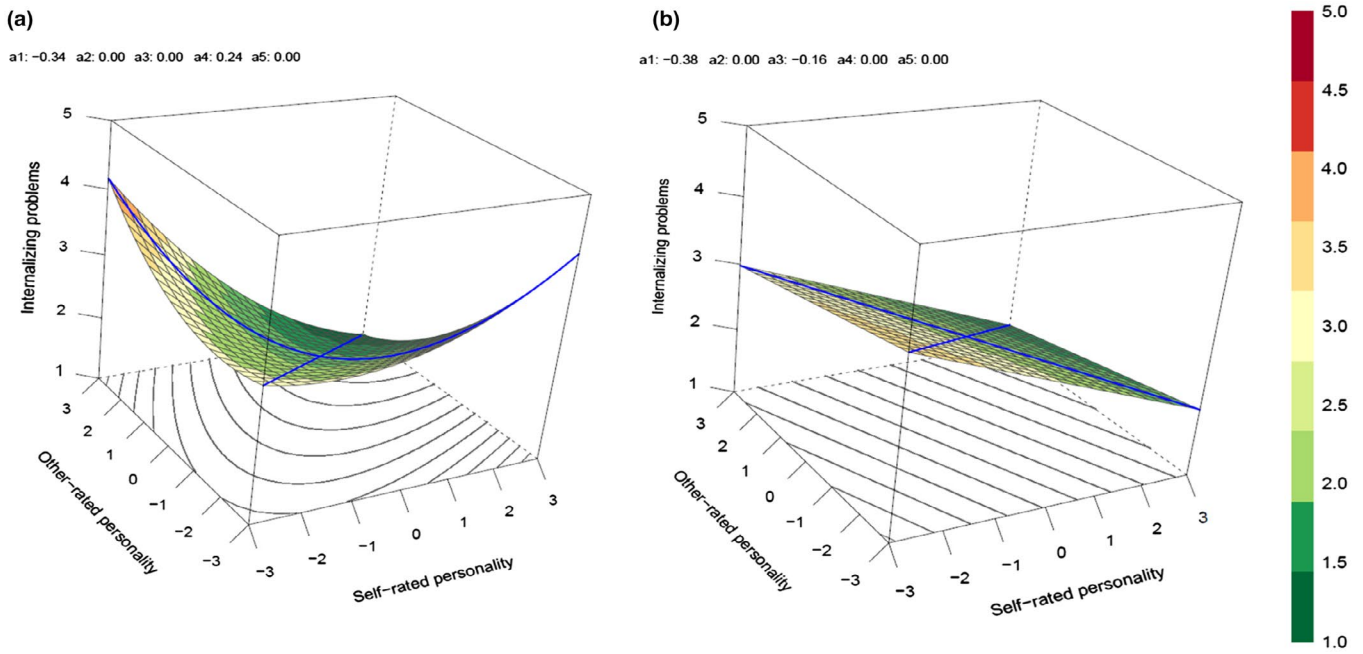


FIGURE 1 Example of response surface reflecting a combination of: (a) negative main effects of self- and other-rated personality (e.g., Emotional Stability) that are equal in size, and a negative personality agreement effect on internalizing problems; (b) negative main effects of self- and other-rated personality, with self-rating effects greater than other-rating effects, and no personality agreement effects on internalizing problems [Color figure can be viewed at wileyonlinelibrary.com]

the LOIC has a U shape, suggesting that the level of internalizing problems increases as self- and other-ratings become more incongruent (a significant and positive a_4). A significant and negative a_4 would lead to an inverted U shape, indicating higher levels of internalizing problems when self–other agreement is higher. If a_4 is significant, a_3 reflects at which point of the LOIC the lowest/highest level of internalizing problems is reached.

In cases where internalizing problems varied along the LOC, we examined how different levels of congruent self- and other-rated personality were related to internalizing problems (e.g., fewer internalizing problems when both the self and others reported high vs. low levels of Extraversion). We investigated both linear (parameter a_1 ; both views are congruently high vs. low) and quadratic (parameter a_2 ; both views are congruently extreme vs. neutral) effects. Finally, when a response surface has a ridge, this line is called the *First Principal Axis (FPA)*. The position of the FPA is indicated by the recently introduced parameter a_5 . To establish an agreement effect, the FPA should equal to the LOC instead of shifting away from the LOC (Humberg, Nestler, & Back, 2019; Nestler et al., 2018).

Considering the rich literature on main effects of self- and other-rated personality on internalizing problems, a_1 was allowed to be significantly different from zero but a_2 was not (Humberg et al., 2019). A significant a_1 would suggest that, due to main effects, personality agreement effects could rely on the level of self- and other-rated personality. To establish

an agreement effect, a_4 should be significant, a_2 , a_3 , and a_5 should be nonsignificant, and a_1 can be either significant or nonsignificant (Humberg et al., 2019; Nestler et al., 2018).

Figure 1a presents an example response surface that meets these requirements for establishing a personality agreement effect. In this hypothetical RSA plot, internalizing problems is lowest at the midpoint of the LOIC, and increases as moving to either direction along the LOIC, when self- and other-ratings becomes more discrepant ($a_4 > 0$, $a_3 = 0$). The LOC equals the ridge line ($a_5 = 0$) and the level of internalizing problems decreases linearly as moving from the front corner to the back corner ($a_1 < 0$, $a_2 = 0$). This figure suggests that personality agreement is best at high levels of this personality trait due to additional linear main effects of self- and other-rated personality (e.g., higher self- and friend-rated emotional stability).

Alternatively, Figure 1b is an example response surface where these requirements are not met. This hypothetical RSA plot shows a situation with only linear main effects of the self- and other-rated personality ($a_1 < 0$, $a_2 = 0$), self-rating effects stronger than other-rating effects, and no personality agreement effects ($a_3 < 0$, $a_4 = 0$).

3 | RESULTS

The mean levels, standard deviations, and intercorrelations of all focal variables can be seen in Table S1 of the online

supplemental materials. Data and the code for data analyses are available from the first-author upon request.

3.1 | Personality agreement and concurrent internalizing problems

Table 1 presents the fit indices of all cross-sectional models for each Big Five trait and each dyad. For the best-fitting models, Table 2 shows the polynomial regression coefficients and, in cases where the full RSA model was the best-fitting model, the RSA parameters. Figure 2 shows the RSA plots.

3.1.1 | Emotional stability

Model 2 was the best-fitting model for all types of self–other agreement on Emotional Stability, suggesting that adding self- and other-rated Emotional Stability substantially improved model fit, but further adding the second-order terms did not. Higher self-rated Emotional Stability predicted fewer internalizing problems, whereas other ratings did not show any unique predictive power.

3.1.2 | Extraversion

For self–mother and self–sibling agreement on Extraversion, Model 2 was the best-fitting model suggesting that adding self- and other-rated Extraversion substantially improved model fit. However, adding the second-order terms did not significantly improve model fit. The parameters suggested that higher levels of self-rated Extraversion predicted fewer internalizing problems, but the predictive effects of mother- and sibling-rated Extraversion were not statistically significant.

For self–friend agreement, Model 3 was the best-fitting model. However, only self-rated Extraversion significantly predicted fewer internalizing problems. The p values of the interaction term did not meet the cutoff value of .005 ($b_{\text{self*friend}} = 0.06, p = .007$). RSA parameters $a1$ and $a3$ were both significant and negative (see Figure 2a). The negative $a1$ indicates that congruent combinations of high (vs. low) levels of Extraversion were associated with fewer internalizing problems. The negative $a3$ indicates that adolescents whose friend-rated Extraversion exceeded self-rated Extraversion showed the highest level of internalizing problems.

3.1.3 | Conscientiousness

For self–sibling and self–friend agreement on Conscientiousness, none of the predictors were significant at the .005 level. For self–mother agreement, Model 3 was the best-fitting model. Only the quadratic term of self-rated Conscientiousness was significant ($b_{\text{self}}^2 = -0.05, p = .005$). Adolescents who saw themselves as either highly conscientious or barely conscientious showed fewer internalizing problems compared to adolescents who saw themselves as moderately conscientious (Figure 2b). None of the RSA parameters were significant.

3.1.4 | Agreeableness

For self–mother agreement on Agreeableness, Model 2 was the best-fitting model, suggesting that both self- and mother-rated Agreeableness substantially improved model fit but adding the second-order terms did not. Self-rated Agreeableness predicted significantly fewer internalizing

Trait	Dyad	AIC (Model 1)	AIC (Model 2)	AIC (Model 3)
Emotional stability	Self–mother	1,033.50	861.21	860.83
	Self–sibling	1,034.13	861.88	863.95
	Self–friend	631.74	518.64	523.98
Extraversion	Self–mother	1,033.50	803.71	808.29
	Self–sibling	1,034.13	804.12	809.97
	Self–friend	631.74	475.00	471.25
Conscientiousness	Self–mother	1,033.50	1,031.46	1,029.22
	Self–sibling	1,034.13	1,030.00	1,031.10
	Self–friend	631.74	630.96	631.89
Agreeableness	Self–mother	1,033.50	985.18	985.25
	Self–sibling	1,034.13	988.47	980.29
	Self–friend	631.74	601.91	593.07
Openness	Self–mother	1,033.50	1,016.20	1,013.47
	Self–sibling	1,034.13	1,026.46	1,027.93
	Self–friend	631.74	625.77	619.43

TABLE 1 Results of model comparison tests: self- and other-rated Big Five personality traits and concurrent internalizing problems

Note: Best-fitting models (based on AIC values) in bold. Model 1 = covariates (i.e., age and gender). Model 2 = covariates + self- and other-rated personality (linear terms). Model 3 = covariates + full RSA model.

TABLE 2 Self- and other-rated Big Five personality traits and concurrent internalizing problems

Trait	Dyad	Best-fitting model (R^2)	Self-rated personality ($b1$)	Other-rated personality ($b2$)	Self-rated personality ² ($b3$)	Self-rated personality × Other-rated personality ($b4$)	Other-rated personality ² ($b5$)
Emotional stability	Self-mother	Model 2 (40.76%)	-0.31, $p < .001$ [-0.35, -0.26]	0.01, $p = .539$ [-0.03, 0.06]	-	-	-
	Self-sibling	Model 2 (40.37%)	-0.30, $p < .001$ [-0.35, -0.26]	-0.01, $p = .581$ [-0.05, 0.03]	-	-	-
	Self-friend	Model 2 (42.88%)	-0.30, $p < .001$ [-0.35, -0.24]	-0.06, $p = .044$ [-0.11, -0.00]	-	-	-
Extraversion	Self-mother	Model 2 (43.89%)	-0.33, $p < .001$ [-0.37, -0.29]	0.03, $p = .121$ [-0.01, 0.07]	-	-	-
	Self-sibling	Model 2 (42.54%)	-0.31, $p < .001$ [-0.35, -0.27]	-0.02, $p = .415$ [-0.06, 0.02]	-	-	-
	Self-friend	Model 3 (48.56%)	-0.37, $p < .001$ [-0.44, -0.30]	-0.05, $p = .242$ [-0.12, 0.03]	0.00, $p = .786$ [-0.03, 0.04]	0.06, $p = .007$ [0.02, 0.10]	-0.03, $p = .067$ [-0.07, 0.00]
Conscientiousness	Self-mother	Model 3 (23.59%)	-0.04, $p = .118$ [-0.09, 0.01]	0.01, $p = .594$ [-0.03, 0.06]	-0.05, $p = .005$ [-0.09, -0.02]	0.04, $p = .109$ [-0.01, 0.08]	-0.00, $p = .755$ [-0.03, 0.03]
	Self-sibling	Model 2 (24.48%)	-0.03, $p = .248$ [-0.06, $p = .006$]	-0.02, $p = .255$ 0.04, $p = .085$	$a3 (b1 - b2) =$ -0.05, $p = .221$	$a4 (b3 - b4 + b5) =$ $p = .042$	$a5 (b3 - b5) =$ $p = .031$
	Self-friend	Model 1 (24.44%)	-	[-0.01, 0.08]	-	-	-
Agreeableness	Self-mother	Model 2 (24.70%)	-0.21, $p < .001$ [-0.28, -0.15]	-0.09, $p = .009$ [-0.16, -0.02]	-	-	-
	Self-sibling	Model 3 (25.04%)	-0.13, $p = .120$ [-0.30, 0.03]	-0.14, $p = .017$ [-0.26, -0.03]	-0.08, $p = .005$ [-0.14, -0.02]	0.10, $p = .007$ [0.03, 0.18]	-0.03, $p = .045$ [-0.07, -0.00]
	Self-friend	Model 3 (34.07%)	$a1 (b1 + b2) =$ -0.27, $p = .019$ 0.27, $p = .050$ [0.00, 0.54]	$a2 (b3 + b4 + b5) =$ -0.01, $p = .757$ 0.16, $p = .237$ [-0.11, 0.43]	$a3 (b1 - b2) =$ $p = .914$ -0.07, $p = .045$ [-0.13, -0.00]	$a4 (b3 - b4 + b5) =$ $p < .001$ -0.18, $p = .002$ [-0.29, -0.07]	$a5 (b3 - b5) =$ $p = .153$ 0.01, $p = .792$ [-0.07, 0.09]
			$a2 (b3 + b4 + b5) =$ -0.24, $p < .001$	$a3 (b1 - b2) =$ $p = .482$	$a4 (b3 - b4 + b5) =$ 0.12, $p = .136$	$a5 (b3 - b5) =$ $p = .140$	

(Continues)

TABLE 2 (Continued)

Trait	Dyad	Best-fitting model (R^2)	Self-rated personality (b1)	Other-rated personality (b2)	Self-rated personality ² (b3)	Self-rated personality × Other-rated personality (b4)	Other-rated personality ² (b5)
Openness	Self-mother	Model 3 (24.81%)	-0.07, $p = .160$	-0.11, $p = .001$	-0.03, $p = .132$	0.08, $p = .004$	-0.02, $p = .174$
			[-0.16, 0.03]	[-0.18, -0.04]	[-0.08, 0.01]	[0.02, 0.13]	[-0.06, 0.01]
	Self-sibling	Model 2 (23.47%)	$a1 (b1 + b2) = -0.18, p = .001$	$a2 (b3 + b4 + b5) = 0.02, p = .471$	$a3 (b1 - b2) = 0.04, p = .458$	$a4 (b3 - b4 + b5) = -0.13, p = .006$	$a5 (b3 - b5) = -0.01, p = .687$
			-0.09, $p = .003$	-0.02, $p = .494$	-	-	-
	Self-friend	Model 3 (28.07%)	[-0.15, -0.03]	[-0.07, 0.04]	-	-	-
			0.04, $p = .559$	-0.02, $p = .757$	-0.03, $p = .291$	-0.11, $p = .006$	0.07, $p = .007$
			[-0.09, 0.16]	[-0.12, 0.09]	[-0.09, 0.03]	[-0.19, -0.03]	[0.02, 0.13]
			$a1 (b1 + b2) = 0.02, p = .807$	$a2 (b3 + b4 + b5) = -0.07, p = .088$	$a3 (b1 - b2) = 0.05, p = .482$	$a4 (b3 - b4 + b5) = 0.16, p = .020$	$a5 (b3 - b5) = -0.10, p = .011$

Note: R^2 refers to the variance explained of the model. The table represents the estimates and 95% confidence intervals of unstandardized regression coefficients, with significant effects ($p < .005$, two-tailed) in bold. Model 1 = covariates (i.e., age and gender). Model 2 = covariates + self- and other-rated personality (linear terms). Model 3 = covariates + full RSA model.

problems. Mother-rated Agreeableness showed a similar trend but the p value was below the cutoff value of .005 ($b_{\text{mother}} = -0.09, p = .009$).

For self-sibling and self-friend agreement on Agreeableness, Model 3 was the best-fitting model, suggesting that adding the second-order terms substantially improved model fit. For self-sibling agreement (Figure 2c), the only significant RSA parameter was a negative $a4$, suggesting that self-sibling agreement on Agreeableness was associated with more internalizing problems.

For self-friend agreement on Agreeableness (Figure 2d), only the interaction term was significant. The only significant RSA parameter was $a2$, indicating that congruent combinations of extreme (vs. moderate) levels of Agreeableness predicted with fewer internalizing problems.

3.1.5 | Openness

For self-sibling agreement on Openness, Model 2 was the best-fitting model. Self-rated Openness significantly predicted fewer internalizing problems, whereas sibling-rated Openness showed no unique predictive power.

For self-mother and self-friend agreement on Openness, Model 3 was the best-fitting model, suggesting that adding the second-order terms substantially improved model fit. For self-mother agreement (see Figure 2e), mother-rated Openness significantly predicted fewer internalizing problems, and its interaction with self-rated Openness was also significant. The only significant RSA parameter was $a1$, indicating that congruent combinations of high (vs. low) levels of Openness were associated with fewer internalizing problems. For self-friend agreement on Openness, none of the parameters was significant at the .005 level.

3.2 | Personality agreement and changes in internalizing problems

We next explored the longitudinal associations between self-other personality agreement and changes in internalizing problems over 1 year, controlling for baseline internalizing problems. Table 3 presents the model-fit indices for all traits. In none of these models, Model 3 was the best-fitting model, suggesting that the second-order terms did not substantially improve model fit when predicting changes in internalizing problems across 1 year.

Table 4 presents the regression coefficients of the best-fitting models. Only self-rated Emotional Stability significantly predicted changes in internalizing problems. For Extraversion, Conscientiousness, and Agreeableness, there was some suggestive evidence for the predictive power of self- and/or other-rated personality, but the p values did not meet the .005 criterion.

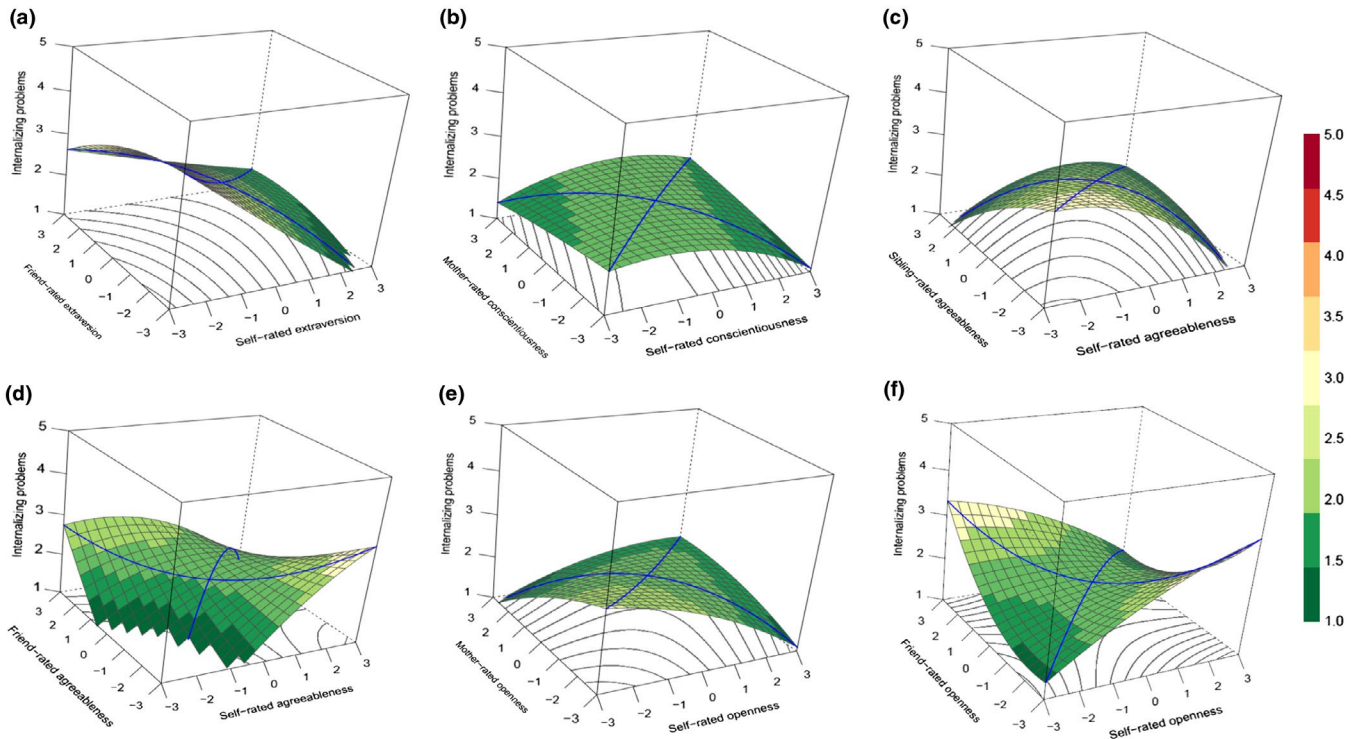


FIGURE 2 Self- and other-rated personality and concurrent internalizing problems [Color figure can be viewed at wileyonlinelibrary.com]

Trait	Dyad	AIC (Model 1)	AIC (Model 2)	AIC (Model 3)
Emotional stability	Self–mother	789.57	782.97	797.39
	Self–sibling	789.97	783.29	787.02
	Self–friend	431.73	431.68	436.38
Extraversion	Self–mother	789.57	782.07	784.17
	Self–sibling	789.97	783.40	787.79
	Self–friend	431.73	429.10	428.98
Conscientiousness	Self–mother	789.57	790.52	795.64
	Self–sibling	789.97	788.89	792.17
	Self–friend	431.73	429.18	431.88
Agreeableness	Self–mother	789.57	785.46	789.28
	Self–sibling	789.97	786.98	785.49
	Self–friend	431.73	434.38	437.71
Openness	Self–mother	789.57	791.83	795.65
	Self–sibling	789.97	788.63	793.61
	Self–friend	431.73	434.61	437.51

TABLE 3 Results of model comparison tests: self- and other-rated Big Five personality traits and changes in internalizing problems

Note: Best-fitting models (based on AIC values) in bold. Model 1 = covariates (i.e., age, gender, and internalizing problems at T1). Model 2 = covariates +self- and other-rated personality (linear terms). Model 3 = covariates +full RSA model.

4 | DISCUSSION

Others’ perceptions of our personality have been theorized to be important for the formation of a coherent self-view, particularly during the formative period of adolescence. Coherent self-views in turn, have been associated with better

mental health and well-being (Cooley, 1902; van Dijk et al., 2014; Donahue et al., 1993; Erikson, 1994).

Besides this *epistemic benefit* of personality agreement, researchers have also proposed some *pragmatic benefits* of personality agreement such as facilitating effective communication and collaboration (Kwang & Swann, 2010; Swann

TABLE 4 Self- and other-rated Big Five personality traits and changes in internalizing problems

Trait	Dyad	Best-fitting model (R^2)	Self-rated personality ($b1$)	Other-rated personality ($b2$)	Self-rated personality ² ($b3$)	Self-rated personality × Other-rated personality ($b4$)	Other-rated personality ² ($b5$)
Emotional stability	Self-mother	Model 2 (49.52%)	-0.07, $p = .004$ [-0.12, -0.02]	-0.01, $p = .583$ [-0.05, 0.03]	-	-	-
	Self-sibling	Model 2 (49.66%)	-0.08, $p = .002$ [-0.12, -0.03]	-0.01, $p = .490$ [-0.05, 0.03]	-	-	-
	Self-friend	Model 1 (57.64%)	-	-	-	-	-
Extraversion	Self-mother	Model 2 (49.00%)	-0.04, $p = .097$ [-0.09, 0.01]	-0.04, $p = .043$ [-0.08, -0.01]	-	-	-
	Self-sibling	Model 2 (48.63%)	-0.05, $p = .024$ [-0.10, -0.01]	-0.04, $p = .076$ [-0.08, 0.00]	-	-	-
	Self-friend	Model 2 (57.06%)	-0.06, $p = .041$ [-0.11, -0.00]	-0.03, $p = .253$ [-0.07, 0.02]	-	-	-
Conscientiousness	Self-mother	Model 1 (48.61%)	-	-	-	-	-
	Self-sibling	-	-	-	-	-	-
	Self-friend	Model 2 (58.80%)	-0.04, $p = .054$ [-0.08, 0.00]	0.05, $p = .024$ [0.01, 0.10]	-	-	-
Agreeableness	Self-mother	Model 2 (49.76%)	-0.07, $p = .034$ [-0.13, -0.00]	-0.04, $p = .151$ [-0.10, 0.02]	-	-	-
	Self-sibling	Model 2 (49.82%)	-0.07, $p = .024$ [-0.13, -0.01]	-0.02, $p = .293$ [-0.06, 0.02]	-	-	-
	Self-friend	Model 1 (57.64%)	-	-	-	-	-
Openness	Self-mother	Model 1 (48.61%)	-	-	-	-	-
	Self-sibling	-	-	-	-	-	-
	Self-friend	-	-	-	-	-	-

Note: R^2 refers to the variance explained of the model. The table represents the estimates and 95% confidence intervals of unstandardized regression coefficients, with significant effects ($p < .005$, two-tailed) in bold. Model 1 = covariates (i.e., age, gender, and internalizing problems at T1). Model 2 = covariates + self- and other-rated personality. Model 3 = covariates + full RSA model.

et al., 1994). Past research has predominantly focused on self–other personality agreement in adult samples (Human & Biesanz, 2011, 2013; Kwang & Swann, 2010), leaving it open whether the implications of self–other personality agreement can be generalized to adolescents.

In the present study, we addressed this gap by examining two alternative perspectives on the developmental consequences of self–other personality agreement in adolescence. The first perspective holds that self–other personality agreement may promote the mental health and well-being of adolescents, who may be particularly vulnerable to incongruent personality feedback because they are in the middle of identity development (Erikson, 1994; Srivastava, 2012). In contrast, the second perspective asserts that self–other personality agreement may be less relevant to individuals who are less committed to a specific self-view (Swann, 2012). Most theories of identity development see adolescence as the beginning of a longer identity development process (Erikson, 1994; Meeus, Schoot, Keijsers, Schwartz, & Branje, 2010). As such, adolescents should have a more flexible and less committed self-view than adults, and may thus be better able to cope with the incongruent feedback regarding their personality traits.

We examined these competing perspectives using multi-informant data from a large sample of adolescents and their close others and employing state-of-the-art statistical analyses. To our knowledge, we were the first to study the implications of self–sibling personality agreement. Overall, we found very little evidence for the beneficial effects of self–other personality agreement on adolescents' mental health. Specifically, across the five personality traits and three self–other dyads, there was only one marginally significant result involving self–friend agreement on Openness ($a4 = 0.16, p = .020$), which may reflect a chance finding. In one case, we even found that self–sibling agreement on Agreeableness predicted *more* internalizing problems ($a4 = -0.22, p < .001$). As this is the first time the impact of self–sibling personality agreement has been examined and this effect did not appear for any other trait measure, this exploratory finding should be interpreted with caution until replicated by future studies.

Overall, our findings appear to support theoretical perspectives that emphasize that adolescents are still in the process of developing a stable identity and have not yet committed to a particular self-view (Erikson, 1994; Meeus et al., 2010). As such, adolescents should be better able to cope with contradicting feedback regarding their personality than adults (Human & Biesanz, 2011, 2013; Kwang & Swann, 2010). Adults who receive incongruent feedback regarding their personalities might feel misunderstood and/or pressure to reorganize or reevaluate their self-views. In contrast, adolescents might perceive new and potentially incongruent feedback regarding their personality traits as less self-threatening.

It is also possible that agreement with close others on the broad Big Five personality traits is less relevant for

adolescents' mental health than agreement on other aspects of the self, such as attitudes, interests, and beliefs. Thus, beyond self–other agreement on personality, future research is needed to better understand the implications of different forms of self–other agreement on mental health and well-being.

Rather than effects of self–other agreement, we found several main effects of both self-rated and other-rated personality traits on internalizing problems assessed both concurrently and 1 year later. Specifically, adolescents showed fewer internalizing problems when they or their close others described them as being high, especially in Emotional Stability and Extraversion, but also in Agreeableness and Openness. This finding is consistent with previous research on the associations between Big Five personality traits and internalizing problems (De Pauw & Mervielde, 2010; Tackett, 2006, 2011). These results provide an important replication and extension of the literature, given that we used both self- and informant reports to assess personality, demonstrating the utility of multi-informant studies in better predicting, diagnosing and understanding adolescent's mental health. Taken together, using RSA we only found main effects of self- and other-rated personality, but no preventive effects of self–other agreement regarding personality traits on adolescents' internalizing problems.

5 | LIMITATIONS AND FUTURE DIRECTIONS

This study has several strengths. First, compared to past approaches on self–other agreement, RSA models allowed us to examine the fit of alternative models and provided a rigorous test of competing hypotheses regarding the implications of self–other personality agreement in adolescence. In addition, the large sample size, multirater assessments, and longitudinal design enabled a high-powered examination of the response surface patterns. Nevertheless, this study needs to be considered in the light of important limitations.

First, our sample was composed of adolescents from intact families from a Western individualistic country. As such, our findings may be less likely to generalize to other cultures and other age groups. It would be interesting for future studies to shed light on the implications of self–other agreement across different cultures (e.g., cultures with different levels of uncertainty avoidance and individualism; Hofstede, 1994) and age groups.

Second, because our longitudinal data only spans 1 year, we were unable to examine the long-term effects of self–other agreement on internalizing problems. It may be that self–other agreement impacts adolescent's psychological adjustment in a more gradual way. Future longitudinal studies covering longer time period (e.g., from late childhood to young adulthood) are needed to more thoroughly examine the effects of self–other personality agreement.

Third, consistent with previous research, self–other personality agreement was modest in the present study, and lowest for less visible traits such as Emotional Stability (Connelly & Ones, 2010; Luan et al., 2017; Vazire, 2010). Past research suggested that self–other personality agreement tends to be lower in younger samples such as adolescents (Rohrer, Egloff, Kosinski, Stillwell, & Schmukle, 2018). More research on the processes of personality judgement is needed to identify the reasons for differences in personality agreement across different life stages.

Fourth, personality agreement can refer to actual agreement or perceived agreement (being known vs. feeling known; Kwang & Swann, 2010). Actual agreement is typically defined as the extent to which self-ratings are congruent with others' ratings of personality (i.e., agreement between self- and other-reports). Perceived agreement captures the extent to which self-ratings are congruent with their own perceptions of how their personality would be rated by close others (i.e., agreement between self-reports). In this study, we adopted a multirater approach to focus on the effects of actual agreement between self- and other-rated personality traits on the development of internalizing problems (cf., Kwang & Swann, 2010; Neff & Karney, 2005; Swann et al., 1994).

As previously noted, self-verification theory proposed both *epistemic* and *pragmatic benefits* of self–other agreement (Kwang & Swann, 2010; Swann, 2012), and we reasoned that actual agreement (i.e., being known) plausibly provide both types of benefits to the target individual. Specifically, in terms of *epistemic benefits*, self–other agreement could promote the stability and coherence of self-views to the degree that people are aware of others' perceptions. Previous research has shown that people know fairly well how their personalities were perceived by close others (i.e., strong correlations between meta- and other-perceptions of Big Five traits), and they can make valid distinctions between how they see themselves and how others see them (e.g., Carlson & Furr, 2009; Carlson, Vazire, & Furr, 2011). In terms of *pragmatic benefits*, actual self–other agreement may be more important than perceived self–other agreement in promoting effective communication and collaboration as ungrounded assumed shared views may even hinder effective interaction. That being said, since the correlations between meta- and other-perceptions of personality traits are strong but imperfect after all, examining the effects of adolescents' *perceived* self–other personality agreement could be an interesting venue for future studies for a more complete understanding of the agreement effect and its underlying mechanisms.

Fifth, our study focused on the psychological benefits of self–other agreement for the target adolescents. However, there may be also benefits for informants and dyads including enhanced relationship satisfaction and understanding (e.g., Letzring, 2008). It would be interesting for future research to examine the potential longitudinal implications of self–other

agreement for personality informants (e.g., enhanced relationship satisfaction and reduced disappointment).

Furthermore, we did not examine potential moderators that may shape the effect of self–other agreement. For instance, it is possible that self–other disagreement might impact communion-oriented individuals more strongly than agency-oriented individuals (“getting along” vs. “getting ahead”; Richards & Larson, 1989), because the former are more concerned about their interpersonal relationship. For some rebellious adolescents, disagreement with certain family members might even be psychologically rewarding. Similarly, effects of self–other disagreement might be largely attenuated or even reversed when individuals do not respect or want to be understood by the other person. It would be important for future studies to test these moderators.

6 | CONCLUSION

The present study was the first to investigate the cross-sectional and longitudinal associations between self–other personality agreement and internalizing problems in adolescence using polynomial regression and RSA. The large sample size, multirater assessments, and longitudinal design enabled a high-powered examination of the response surface patterns. Results indicated strong main effects of self- and other-rated personality traits, but little preventive effects of self–other agreement regarding personality traits on adolescents' internalizing problems. Our results cast doubt on the generalizability of the beneficial effects of self–other agreement documented in the adult literature to adolescents but highlight the importance of self- and other-reported personality in youth's mental health development.

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CONFLICT OF INTEREST

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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ENDNOTE

¹ $a1 = \text{self-rated personality} + \text{other-rated personality}$ (i.e., $b1 + b2$); $a2 = \text{self-rated personality}^2 + \text{self-rated personality} * \text{other-rated personality} + \text{other-rated personality}^2$ (i.e., $b3 + b4 + b5$); $a3 = \text{self-rated personality} - \text{other-rated personality}$ (i.e., $b1 - b2$); $a4 = \text{self-rated personality}^2 - \text{self-rated personality} * \text{other-rated personality} + \text{other-rated personality}^2$ (i.e., $b3 - b4 + b5$); and $a5 = \text{self-rated personality}^2 - \text{other-rated personality}^2$ (i.e., $b3 - b5$).

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

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