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Social expectations and abilities to meet them as possible mechanisms of youth personality development

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Abstract

Objective: Personality traits change from childhood through late-adolescence, however the effects of social expectations and self-regulatory efforts remain unknown. This study aims to explore mechanisms underlying personality development by assessing mean levels personality traits from childhood to late-adolescence.

Method: We used Common-Language California Child Q-Set to measure youths' ($N = 11,000$) mean personality trait levels; social expectations for these traits as perceived by parents ($N = 47$), teachers ($N = 42$) and students ($N = 120$); and self-regulatory efforts required for achieving the desired levels in these traits as perceived by parents ($N = 27$), teachers ($N = 26$), and students ($N = 54$).

Results: Expectations for youths' traits were consistent, regardless of raters' or youths' age. In our unique between-trait study design, traits' mean levels were positively associated with expectations for them, but age differences minimally tracked these expectations. Traits' required self-regulatory efforts were not associated with their developmental trends.

Conclusions: Results were only partially consistent with existing developmental theories of personality development.

KEYWORDS

mean-level, personality development, personality traits, self-regulation, social expectations

1 | INTRODUCTION

Personality traits change from childhood through mid-adolescence. In adulthood, traits tend to gradually shift in a socially desirable direction, with people becoming, on average, more agreeable, conscientious, and emotionally stable (Allemand et al., 2008; Caspi et al., 2005; Donnellan & Lucas, 2008). However, the pattern is different during

childhood and adolescence, with temporary mean-level decreases in Agreeableness, Conscientiousness, Openness to Experience and Emotional Stability during early adolescence followed by increases in these traits' mean levels in late adolescence (Allik et al., 2004; Denissen et al., 2013; Soto, 2016; Soto & John, 2014; Van den Akker et al., 2014).

Drawing on social investment theory (SIT) (Roberts et al., 2005), Denissen et al. (2013) discussed the roles of

social expectations and self-regulation demands as possible mechanisms of youth personality development. The SIT suggests that personality matures as individuals are confronted with new environments and associated social expectations, thus altering their behavior accordingly. Denissen et al. (2013) expanded on SIT by proposing that although changes in expectations drive personality change by motivating individuals to meet these expectations, regulatory efforts determine how much individuals can actually change their traits. In their meta-analysis, Denissen et al. (2013) found that mean levels of two personality traits, conscientiousness and openness, decreased during early adolescence, followed by an increase in later adolescence. In their view, although social expectations increase with age, early adolescents may lack sufficient regulatory skills to meet these expectations which thus leads to a temporary decrease in how their personality traits are perceived by themselves and others. This, the theory suggests, is due to an increased gap between expectations for the youth and their actual behavior. Late adolescents, however, are hypothesized to have more developed regulatory capacities that allow them to better meet the expectations, which in turn leads to the rebound of rated personality traits in late adolescence. It is at this stage, then, the gap between expectations and actual behavior should be narrow.

The present study set out to test the key ideas of Denissen et al. (2013) by investigating whether (a) social expectations for youths' behavior, and (b) the degree of self-regulatory efforts needed to meet these expectations are among the potential mechanisms that could explain mean-level personality trait changes. The definition of social expectations has varied across research (Gekoski et al., 1983; Morgan, 2007); here it is operationalized as raters' (parents, teachers, and college students rating from the perspective of peers) expectations of how individuals should think, feel and behave. It is important to test social expectations across different groups of important others for children because they—for example, parents versus peers—may hold systematically different expectations for a range of traits such as pushing boundaries, stretching rules, or enjoying physical affection. It could also be that social expectations are more likely to systematically influence personality development if they are consistent across sources of significant others.

Expectations for youths' behavior may also change over time. For example, expectations may become higher as children mature into adolescents. We therefore also measured perceived levels of expectations separately for children (8 to 10 years) and late adolescents (16 to 18 years) to allow us to assess possible changes across these two developmental stages. By self-regulatory efforts we here mean

the extent of effort required to meet the generally desired trait levels as perceived by others; thus, our research questions, hypotheses, and analyses focused on differences between traits, not differences between people.

1.1 | Hypotheses

Based on the influential theoretical model of Denissen et al. (2013), we delineated several tentative hypotheses to explore the roles of social expectations and self-regulation in mean-level trait development. We tested them via quantifying a set of diverse personality traits in terms of their (a) observed mean-level changes through childhood and adolescence, (b) socially expected levels (by parents, teachers, and college students rating from the perspective of peers), (c) changes in these expected levels through childhood, and (d) degrees of perceived self-regulatory effort required to meet the expected levels.

Given these data, we addressed four key research questions:

Question 1: Do children's personality traits comply with social expectations? We hypothesized that traits with social expectations in favor of higher scores would have higher scores across all ages (Hypothesis 1).

Question 2: Do children's personality traits change over development in accordance with (changes in) social expectations? Mean-levels of traits may change in accordance with changes in their expected levels (Hypothesis 2a). Additionally, based on the idea that the ability to effortfully control one's traits strengthens over development, we hypothesized that age would moderate the association between expectations and observed trait levels. Specifically, we hypothesize the strength of the relation between social expectations and trait levels will be stronger during late adolescence than during early adolescence (Hypothesis 2b).

Question 3: Do traits that are perceived to require the greatest self-regulatory efforts fall furthest short of expectations, especially before self-regulation abilities are more fully mature? Trends of the discrepancies between expected and mean trait levels may be moderated by the degree to which traits require self-regulation, with traits requiring more self-regulation displaying larger discrepancies between socially expected levels and levels actually observed in children (Hypothesis 3a). This effect may be further moderated by age (as an indicator of self-regulatory capacities) such that the discrepancy is linked with a trait's perceived self-regulatory efforts more strongly in children and early adolescents whose self-regulatory efforts are not yet as well developed as in older adolescents (Hypothesis 3b).

2 | METHODS

2.1 | Selecting a diverse set of traits: The Common-Language California Child Q-Set (CCQ)

Addressing these specific research questions assumes that personality develops along many trait dimensions that differ in terms of their social expectations and self-regulatory efforts. Often, personality development is studied along a few broad dimensions such as the Big Five or Little Six (Shiner & DeYoung, 2013; Soto & John, 2014; Soto & Tackett, 2015). However, adequately testing our hypotheses requires comparisons between a larger number of traits and indeed there is a wealth of evidence that personality does in fact develop along numerous dimensions. For example, specific facets of the same Big Five domains, and even specific nuances of the same facets (McCrae, 2015), often display disparate age trends (Jackson et al., 2009; Lucas & Donnellan, 2009; Möttus et al., 2015; Möttus & Rozgonjuk, 2021; Möttus, Sinick, et al., 2019; Soto & John, 2014; Terracciano et al., 2005). Nuances are the lowest level of the personality trait hierarchy and are typically operationalized by individual questionnaire items (Condon et al., 2020; Möttus et al., 2020). Nuances show the valid specific variance and distinctive properties of traits such as cross-method agreement, rank-order stability, and heritability (Condon et al., 2020; Möttus et al., 2014, 2017). Therefore, the present study examined personality development at the nuance level.

We measured children's personality traits, social expectations for the traits, and self-regulatory requirements for behaving in expected ways using the Common-Language California Child Q-Set [CCQ] (Block & Block, 1980), which was specifically designed to cover a broad range of youth personality characteristics with low redundancy among the items. It includes 100 items that can be used by a non-professional observer to describe a child or adolescent (Block & Block, 1980; Caspi et al., 1992), with 94 of the items focusing on personality, and the remaining six representing physical characteristics and other non-personality attributes (Soto, 2016; Soto & John, 2014). Although the CCQ items can be aggregated to measure broad traits like the Big Five or Little Six, they were developed to be individually informative and non-redundant (Block & Block, 1980). Due to the item-level focus of the CCQ, as well as the need to test the present hypotheses across a large and diverse set of personality traits, we analyzed each of the 94 personality-focused CCQ items as representing a partly distinct, nuance-level personality trait (McCrae, 2015; McCrae & Möttus, 2019). Its content diversity and lesser focus on *the priori* structure of items made the CCQ a more suitable personality measure for

our purposes than questionnaires developed to measure particular trait models such as the Big Five.

2.2 | Mean-level personality traits

Mean-level personality traits were measured through parents' ratings of their child's personality traits on each CCQ item, using a 9-point Likert scale ranging from 1 (extremely uncharacteristic) to 9 (extremely characteristic). Note that we calculated the mean trait levels separately for each age under consideration, allowing us to study age-related trajectories in the traits—that is, normative developmental patterns.

2.3 | Quantifying social expectations

People in different social roles may hold different expectations regarding youths' behavior. We operationalized the socially expected levels of personality nuances by separately surveying parents, teachers and students. Beyond providing each personality nuance with a social expectation level, this also allowed us to test variations in the expectations across the different kinds of significant others of children. To measure social expectations for personality traits, parent, teacher and student participants were asked to rate each CCQ item in terms of whether they would generally approve or disapprove of children thinking, feeling or behaving in the way described in the item; students were also asked to rate how much they thought teachers would approve of it. Participants made these ratings on a 5-point Likert scale ranging from 1 (strongly disapprove) to 5 (strongly approve).

2.4 | Quantifying perceived self-regulatory efforts

Different behavioral traits likely vary considerably in difficulty for children and youths to enact: for some traits, it is easier to achieve socially expected levels than for others. To quantify such differences, we again surveyed parents, teachers and students about the perceived level of effort required to enact each trait. For each nuance, participants were asked to rate how much self-control it would take for a child to behave in this way when they would otherwise be inclined to behave differently, also using a 5-point Likert scale ranging from 1 (almost no self-control) to 5 (an extreme amount of self-control). To maximize the clarity of the rating process for participants, the wording of some items was modified for this condition so that all items described behavior in a socially desirable direction

(based on the previously collected expectation ratings described above). For example, the socially undesirable item 'tries to take advantage of other people' was changed to 'tries to avoid taking advantage of other people'. Teachers and parents are in a good position to observe youths' behaviors and difficulties in complying with expectations, and college students can draw on their own recent first-hand experiences during adolescence. We anticipated that rating the level of perceived self-regulatory efforts needed for enacting different traits would be a difficult task for any single rater and that individual ratings could therefore be fairly unreliable. But we deemed it likely that the aggregate ratings of many raters would prove more reliable, as indicated by high average-rater reliability [intraclass correlation (ICC)] and similar average ratings across different perspectives (teachers, parents, and students).

2.5 | Summary

In sum, we examined a diverse set of 94 highly specific personality nuances, represented by the 94 personality-relevant CCQ items. For each CCQ item, we obtained (a) parent-reports of children at different ages, to quantify each nuance's pattern of mean-level development, (b) its mean level of desirability, as judged by parents, teachers, and students, to quantify the social expectations for each nuance, and (c) the perceived degree of self-control required to enact it, as again judged by parents, teachers, and students, to quantify the self-regulatory requirements for each nuance. These data allowed us to test relations, across the 94 personality nuances, between mean-level development, social expectations, and self-regulatory requirements.

3 | PARTICIPANTS

Participants for measuring youths' mean-level personality traits were drawn from an initial sample of parents of 16,000 children aged from 3 to 20 years, with each parent rating their child on the CCQ items (Soto & John, 2014). The target children included 500 boys and 500 girls for each age from 3 to 17, as well as 500 boys and 500 girls from the combined ages 18 to 20 years; this was to make each age group equal in size and gender balanced (Soto & John, 2014). In the present study of later childhood and adolescence, we focused on children between the ages 8 and 18–20 which accounted for 11,000 participants in total.

As described above, participation entailed rating each personality-focused CCQ item in terms of its most socially approved level and how much self-regulation, or effort,

would be required to behave, think, or feel in a socially desirable way. It is again important to bear in mind that ratings were about items, not actual children. Parents and teachers were recruited from the online research platform Prolific and compensated with £2.50, whereas students completed the study for course credit. Twenty-one participants who did not complete the questionnaire were excluded from the study, resulting in a sample of 74 parents, 68 teachers and 74 students.

4 | DATA ANALYSIS

The data and R code used in this study are made publicly available in the online resource (<https://osf.io/pkda3/>).

To investigate associations of the mean-level traits with the social expectations and self-regulatory efforts for these traits, we constructed multi-level models (or mixed-effects models) as implemented in the *lme4* package version 1.1.18 (Bates et al., 2014). In these models, either items' means in the parent-ratings of children or the discrepancy between expected and observed trait levels constituted the dependent variable, whereas age and perceived expectations and/or self-regulatory efforts for these items were independent variables. Specifically, we re-arranged the data into a table with 94 (items) \times 11 (age groups, from 8 to 18–20) = 1034 rows, with the parent-rated (pertaining to actual children) mean of each item in the dependent variable column, and the mean social expectations and self-regulatory efforts of the items, alongside age and squared age (for quadratic effects) corresponding to these particular means, in the independent variable columns. Parent-rated personality traits and expectations were coded so that all items were keyed in the socially desirable directions (i.e., with mean expectations at or above the scale mid-point). Specifying random intercepts and slopes for items (11 individual observations—means—for each item, one for each age group being "nested" within the item) allowed us to test the main effects of age (and its square), expectations and perceived self-regulatory efforts, as well as interactions among them, on items' means while controlling for dependencies in the data (i.e., the same items administered at different ages) and allowing items to vary in age trajectories (random slopes). Items' means, as well as social expectation and perceived self-regulatory efforts ratings were grand mean centred (across the 94 items and 11 ages), and age was centred at 13 (i.e., the median age) prior to computing squared age. The discrepancy between expected and observed trait levels was calculated by subtracting items' means from their social expectations, and the discrepancies were grand mean standardized. Moreover, age and age-squared were divided by 13 before building the model to avoid model convergence issues due

to large differences in variances among individual variables. We report fixed effects from these models, which summarize general associations between developmental trends, social expectations, and self-regulatory requirements across all items, while accounting for their unique deviations from the fixed effects.

5 | RESULTS

We first estimated the consistency of social expectations and self-regulation ratings within and across two age groups of targets and in a combined age group: children (8- to 10-year-olds), teens (16- to 18-year-olds) and youths generally (8- to 18-year-olds). For most items. Parents, teachers and students did not differ in their ratings of social expectations of youths, with the average effect size (eta-squared) across the 94 items being .06. Also they did not differ in their ratings of these across the different age groups (children of 8- to 10-year-olds or adolescents of 16- to 18-year-olds). The intraclass correlation (ICC) of the average ratings across all raters and ages was .98 for social expectations. For self-regulatory efforts, the intraclass correlation (ICC) of the average ratings across all raters and ages was .91. No items significantly varied in terms of their means between the two target ages (children: 8- to 10-year-olds; teens: 16- to 18-year-olds), either with or without collapsing parent-ratings and teacher-ratings for the respective target ages; the average eta-squares were .05 and .02, respectively. The detailed descriptive data, selection process and discussion were included in the [supplementary material](#).

5.1 | Effects of social expectations on traits mean levels

When the means of the 94 items (from parents' ratings of their actual children) were predicted from the social expectations for these items (combined across all rating conditions) in a multi-level model, traits with higher expectations tended to have higher parent-rated means

(standardized estimate $b = .30$; [Table 1](#)). Thus, supporting Hypothesis 1, the pattern of mean-level personality traits tended to comply with the pattern of social expectations.

5.2 | Effects of age on traits mean levels

In the same model, age had a negative linear fixed effect on items' means, whereas the interaction between age and social expectations was not statistically significant ([Table 1](#)). Thus, inconsistent with Hypothesis 2a, there was no evidence that the linear trends in personality traits' developmental trajectories positively tracked the social expectations for these traits—that is, although socially more approved traits had generally higher levels, they were no more likely to trend higher still (or no less likely to trend lower still, given the general downward trend in traits) than less approved traits.

When we added the quadratic term (age-squared) to the model as an additional main effect, age continued to have a negative linear fixed effect on item means, whereas age squared had a *positive* linear fixed effect on item means. When we also added the interaction between age-squared and social expectations to the model, the interaction between age and expectations remained non-significant, but the interaction between age-squared and expectations was significant ([Table 1](#)). However, given that we tested multiple associations in this study, this association needs to be interpreted with caution.

Age trends for traits with high, medium, and low expectations (each group had a third of the items) are depicted in [Figure 1](#). It shows that: (a) items at all levels of expectations showed general declines with age, but (b) items with high expectation levels showed a small uptick in later adolescence, driving the non-linear age effect's interaction with social expectations, and (c) items with low and medium expectation levels were fairly similar in their overall means, whereas most of the effects pertained to items with the highest expectation levels. Taken together, these results weakly support Hypothesis 2b by indicating that traits with the highest social expectations showed negative age trends from childhood through mid-adolescence,

TABLE 1 Estimates of the model to test the effects social expectations and age on mean-level personality traits and their change

	Linear model				Quadratic model					
	Intercept	Soc	Age	Age × Soc	Intercept	Soc	Age	Age ²	Age × Soc	Age ² × Soc
Mean	−.000	.303	−.035	.004	−.040	.284	−.035	.052	.004	.024
SE	.093	.093	.012	.012	.091	.091	.012	.010	.125	.010
<i>p</i>	>.99	.002**	.007**	.976	.660	.002**	.007**	<.001***	.976	.021*

Abbreviations: Age², age squared; Soc, social expectations.

* $p < .05$; ** $p < .01$; *** $p < .001$.

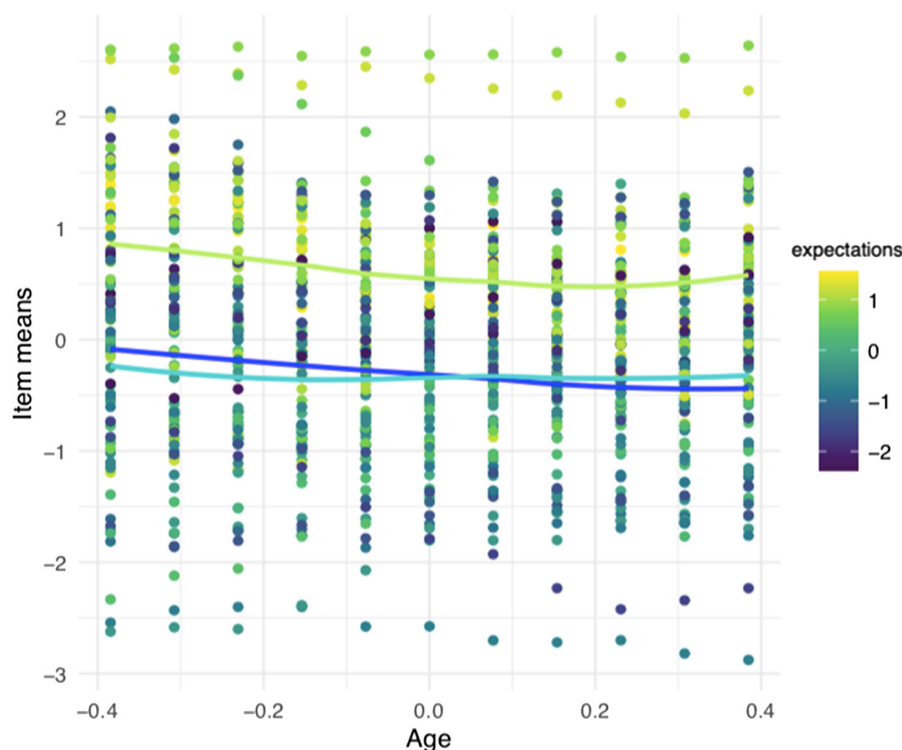


FIGURE 1 The effect of different levels of social expectations and age on mean-level personality traits. The items were divided into three groups based on the high, medium and low expectations (lowest, middle and highest third of the items). The light green indicates the highest level of expectation, the light blue indicates the middle level of expectation, and the dark blue indicates the lowest level of expectation. The y-axis represents standardized item mean scores. The information shown in this figure is based on the observed data.

TABLE 2 Estimates of the model to test the effects self-regulation and age on discrepancies between expected and observed trait levels and their change

	Linear model				Quadratic model					
	Intercept	SR	Age	Age × SR	Intercept	SR	Age	Age ²	Age × SR	Age ² × SR
Discrepancy	.000	.021	.302	-.016	.035	.036	.302	-.046	-.016	-.019
SE	.099	.099	.109	.109	.099	.099	.109	.009	.109	.009
<i>p</i>	>.99	.835	.007**	.886	.723	.721	.007**	<.000***	.886	.038*

Abbreviations: Age², age squared; SR, self-regulation.

p* < .05; *p* < .01; ****p* < .001.

but minor positive trends in late adolescence. Again, this association was not strong and future studies are needed to estimate the replicability of these results.

5.3 | Effects of self-regulatory efforts on traits mean levels

As in the analyses of social expectations, mixed-effects models were fitted to test whether traits' perceived self-regulatory efforts could help explain age differences in the gap between social expectations for traits and their

mean-levels. The discrepancies between expected and observed trait levels were the dependent variable, and age, age squared, rated self-regulatory efforts of the items, and the interaction between them were the independent variables. Across the 94 items, their perceived self-regulatory effort requirements were not linked with the discrepancies between their expected and observed levels and the interaction between age and self-regulation was also not significant (Table 2). This suggests that age-differences in the discrepancies between children's expected and actual trait levels were not moderated by the perceived self-regulatory efforts of these traits. However,

when we also added the interaction between age-squared and self-regulatory efforts, the interaction between age squared and self-regulatory efforts was significant; again, however, the interaction term was small and the p -value not compelling. The results of this final model are depicted in Figure 2. Failing to support Hypothesis 3a, these results indicate that traits' self-regulatory efforts were not associated with age trends in the discrepancies between expected and observed trait levels. However, Figure 2 also shows that traits with highest perceived self-regulatory efforts—but not those with medium or low efforts—showed a very modest reduction in discrepancies during late adolescence. Only weakly supporting Hypothesis 3b, these results suggest that traits with the highest self-regulatory efforts were somewhat more likely to catch up with the overall age trends as children's actual self-regulation skills get better. Considering that plotting the raw score of discrepancies between expected and observed trait levels would be easier to interpret compared with standardized score, we thus included the plot of the effect of different levels of self-regulation demands and age on discrepancies (raw score) between expected and observed trait levels and this plot showed the same pattern as the standardized score of discrepancy (see Figure 3).

6 | DISCUSSION

Previous research has documented personality trait development from childhood to late adolescence but the mechanisms underlying this change remain poorly understood. Seeking to tackle this issue, we addressed three questions relating to the roles of social expectations and self-regulation efforts as possible mechanisms of personality change through childhood and adolescence. Building on influential earlier work by Denissen et al. (2013), who in turn built on the Social Investment Theory (Roberts et al., 2005), we hypothesized that nuance-level personality traits and normative changes in them would track social expectations for these traits, and that these developmental shifts in the traits would be moderated by the self-regulatory efforts that meeting the desired trait levels would require. We found that: (a) social expectations were linked with traits' overall levels, (b) social expectations were not linked with the traits' mean-level age trajectories, apart from a slight uptick characterizing the most socially desirable traits in late adolescence, and (c) traits' self-regulation needs were not linked with either the discrepancies between expected and observed trait levels or age-related differences in them, apart from a slight uptick characterizing traits with the strongest self-regulation

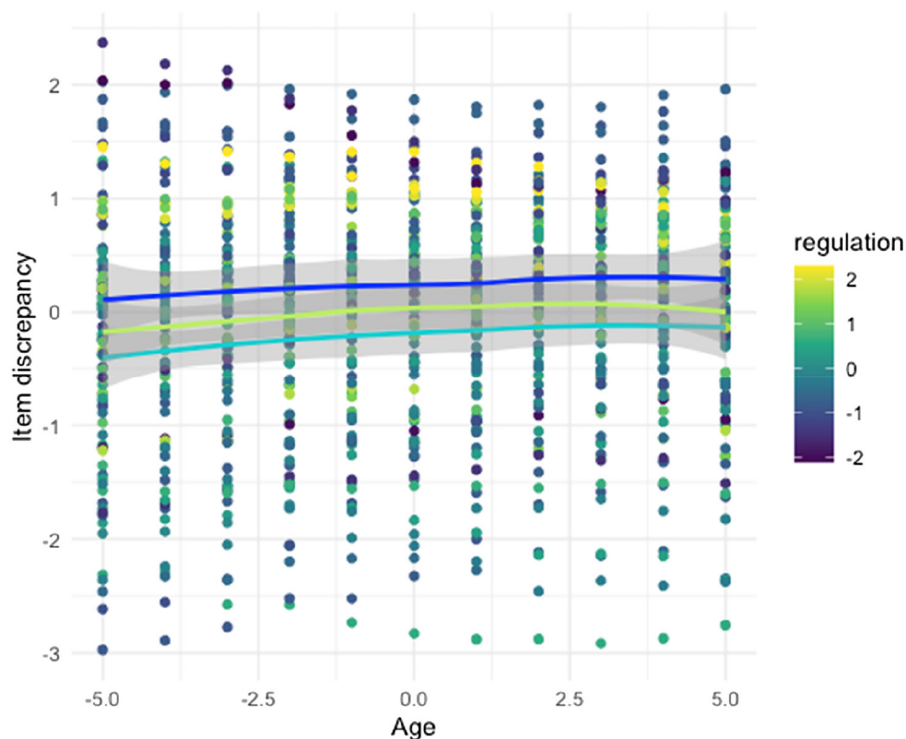


FIGURE 2 The effect of different levels of self-regulation demands and age on discrepancies between expected and observed trait levels. The items were divided into three groups based on self-regulation demands (lowest, middle and highest third of the items). The light green indicates the highest level of regulation demands, the dark green indicates the middle level of regulation, and the dark blue indicates the lowest level of regulation demands. The y-axis represents standardized scores of the discrepancies between expected and observed trait levels. The information shown in this figure is based on the observed data.

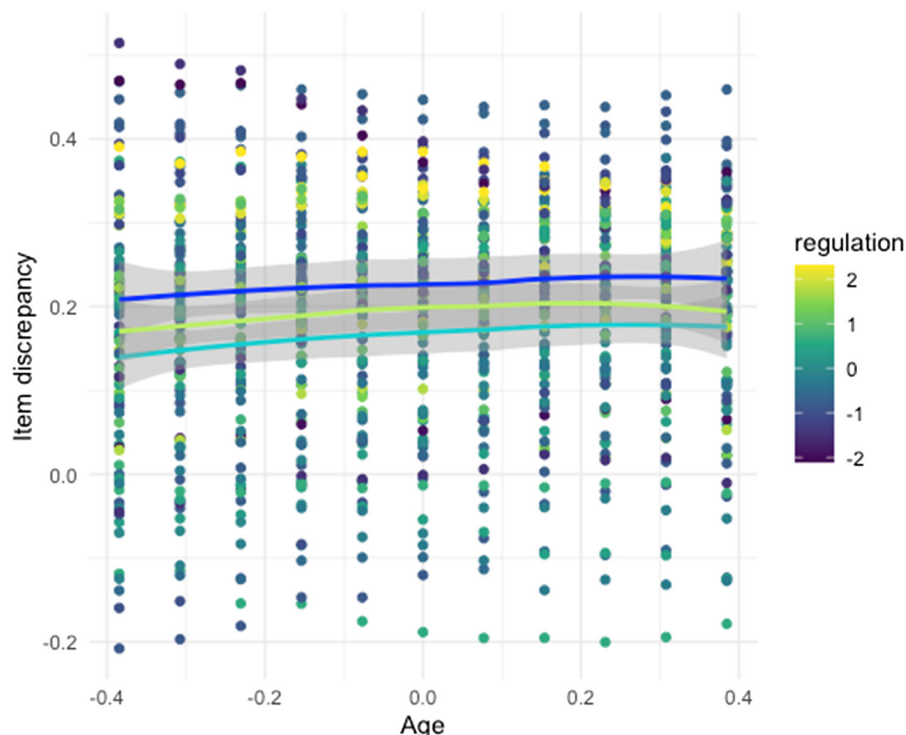


FIGURE 3 The effect of different levels of self-regulation demands and age on discrepancies between expected and observed trait levels (raw score). The items were divided into three groups based on self-regulation demands (lowest, middle and highest third of the items). The light green indicates the highest level of regulation demands, the dark green indicates the middle level of regulation, and the dark blue indicates the lowest level of regulation demands. The y-axis represents raw score of the discrepancies between expected and observed trait levels. The information shown in this figure is based on the observed data.

demands in late adolescence. Therefore, the hypotheses derived from Denissen et al. (2013) were only partially supported in the present study.

6.1 | The role of social expectations

Our first question was whether children's personality traits generally comply with social expectations. Here, we operationalized social expectations thoroughly, measuring them for nearly a hundred traits rated by parents, teachers, and students. According to our results, social expectation ratings are positively related to overall trait mean levels, suggesting that higher social expectations are associated with higher mean level personality traits. This finding is in line with the broad literature suggesting that personality changes under high social pressure (Hurlock, 1994; Specht, 2017). For example, behaviors that are generally related to strong rules from parents and teachers such as in the school context are associated with higher social pressure and it is therefore likely that students behave similarly as a result of this strong social pressure from their teachers and parents. Behaviors that are under less social pressure, such as those observed outside school, are likely going to comply less with social

expectations and result in more individual differences because there are general less expectations and social pressure associated with such behaviors (Specht, 2017).

Our second key research question was whether children's personality traits change in accordance with expectations. Partially supporting our hypotheses (Hypothesis 2), we found that although the linear trends in mean-level developmental trajectories of personality traits did not track the social expectations for these traits, there were associations between non-linear age trends and social expectations: normative personality trends from middle childhood into adolescence were generally negative, but the traits with the highest expectations showed a tiny up-tick in late adolescence. Thus, our results lend only modest support to the hypothesis that personality development in childhood and adolescence is partly driven by social expectations. This association was weak, and therefore, future studies are needed to make these interpretations with more confidence.

Insofar as the mechanisms of personality development would be expected to be similar in childhood and adulthood, our results are consistent with the emerging empirical literature testing the SIT, insofar as empirical support for it is limited. This theory posits that mean-level changes are driven by people becoming committed

to new social roles and the expectations that come with these roles (Bleidorn et al., 2013; Roberts et al., 2005). Essentially, then, this theory would be consistent with average personality traits converging toward widely held social expectations. However, the wider existent pattern of empirical findings generally lends only modest support to the SIT (Bleidorn et al., 2020; Denissen et al., 2019; McCrae et al., 2021).

6.2 | The role of self-regulation efforts

Our third key question (Hypothesis 3) was whether more demanding traits (i.e., those that are perceived to require adolescents to exert a high degree of self-regulation) fall farthest short of expectations, especially before self-regulation skills are more fully in place. This hypothesis was also inspired by work by Denissen et al. (2013) who proposed that social expectations influence personality development in conjunction with youths' abilities to meet these expectations, and this requires self-regulation skills that may develop more slowly than is expected of the youth. This could, for example, explain the dip in mean trait levels toward socially undesirable directions around mid-adolescence (Soto, 2016). We found that traits' self-regulatory efforts did not have a strong effect on the age trajectories of these traits: discrepancies between actual and expected trait levels were not moderated by the degree to which traits require self-regulatory efforts. However, traits with high self-regulatory efforts showed a very modest reduction in discrepancies during late adolescence when youths' tend to have acquired more adequate self-regulation skills, whereas traits with medium or low demands did not show the same trend. Support for Hypothesis 3 was thus very modest.

Our findings point to a need to consider additional or alternative explanations to self-regulation development for the self- and other-reported 'dip' in youth personality traits around mid-adolescence. According to Moffitt and colleagues (Moffitt et al., 1996), for example, anti-social behaviors and conduct problems are prevalent from late childhood to mid-adolescence but often stop in the early 20s. In their view, this may be an adaptive response to teens' social context: physically and cognitively mature youth increasingly desire adult privileges and see socially disapproved conduct as a way to gain autonomy from parental control (Moffitt et al., 1996; Moffitt & Caspi, 2001). Likewise, our results may reflect a tendency for adolescents to rebel against parental control and expectations; and this may require as much self-regulation, on average, as conforming to the expectations. Another explanation could be that self-regulation skills do not fully mature until after adolescence (and in adolescence they may

be temporarily undermined by a peak in reward drive) (Murray et al., 2021), so perhaps these mechanisms may become more relevant to personality change in the transition from adolescence to emerging adulthood.

It is also possible that our operationalization of the degrees to which traits require self-regulation was sub-optimal: we asked panels of parents, teachers and college students (recent adolescents) to rate this. We chose this method over alternative methods such as experimental tasks, because such tasks are known to correlate very poorly with subjectively rated personality traits and even among themselves (Mazza et al., 2020). Experimental procedures for capturing items' self-regulation requirements may also suffer from low ecological and face validity, as well as low reliability. However, our raters may not have had a very good sense of the levels of demand for youth to behave, think or feel in particular ways. Indeed, the inter-rater agreement between individual raters was sometimes very low. However, the average-rater reliability of the ratings was excellent, and even more importantly, the average ratings from different rating conditions agreed well (see [supplementary material](#)). This suggests that the average ratings were generally reliable and contained a substantially converging signal.

To improve the operationalisation of perceived self-regulation required to enact a trait, it may be helpful in future research if youths themselves could rate the items for the self-regulation needs perspective. We were unable to do this in the current study because of the large additional burden this would place on young participants, and the difficulty of measuring this concept in a developmentally appropriate but cross-age comparable way for the wide range of participants in the current study. As self-reported and informant-reported data reflect the same psychometric constructs (Möttus, Allik, & Realo, 2019; Olino & Klein, 2015), we reasoned that the panel of parents, teachers and college students would provide sufficiently valid ratings.

Social desirability, which is logically linked with social expectations, could have influenced informants' ratings, including parents ratings of their own children. The correlation between traits' mean levels and social expectations may therefore have been confounded by social desirability. Also, personality traits tend to shift in a socially desirable direction as they age into adulthood, at the mean level (Allik et al., 2004; Caspi et al., 2005; Donnellan & Lucas, 2008). When informants (e.g., parents) rate children, they might compare their children with a reference standard such as the generally accepted social desirability when considering personality items; thus their estimation might lack convergent validity in relation to the ratings of social desirability and expectations, confounding the correlation between age differences in traits' mean levels

and expectations. However, we do not believe that our social expectations ratings were simple reflections of social desirability. As reported in the [supplementary material](#), the correlation between items' social expectations and the mean levels was small ($r = .30$), whereas correlations between items social desirability and their mean levels are usually much higher (Konstabel et al., 2006).

6.3 | Strengths and limitations

The present research had a number of strengths, including its use of a large parent-report sample and a personality measure—the CCQ—that was well suited to testing differences in youth personality development across an array of highly specific, nuance-level traits. Moreover, we capitalized on an underused research design by examining systematic variability among many traits in various focal properties [we studied variance between traits, not between people; for discussion, see (Möttus et al., 2020; Möttus & Rozgonjuk, 2021)].

However, a number of limitations should also be considered. First, we used a cross-sectional rather than longitudinal research design. Although the resulting data suggest changes in trait mean levels across childhood and adolescence, they did not allow us to directly observe such changes. Therefore, additional research is needed to test whether the present findings extend to longitudinal data. Second, the samples used to estimate social expectations may not have been large or diverse enough to represent the general population; however, the extent to which ratings of different rater groups converged lends credit to the possibility that social expectations for personality traits are relatively universal. Moreover, the average inter-rater agreement for parents of children aged 16 to 18 years was relatively low. Future research is therefore needed to further examine self-regulation in these groups.

Third, this study investigated youths aged from 8 to 18. Some of our findings showed a very slight uptick in late adolescence for traits with (a) the highest expectations and (b) requiring the most perceived self-regulatory efforts. These age trends may not end at age 18 and further research is needed to test whether they extend into adulthood. A fourth limitation concerns the measurement of self-regulation. We asked a panel of parents, teachers, and college students to rate the degrees to which different personality traits require self-regulation. Although there was generally good agreement across raters and conditions (see [supplementary material](#)), there is an assumption that perceptions of self-regulatory efforts from parents, students, and teachers may accurately reflect the actual self-regulatory requirements that the traits pose to youth. Our analyses were based on single items, which

are likely to have lower reliabilities than aggregate scale scores and may have led us to underestimate any true effects. Although this information is not available for the CCQ, recent findings have shown that single personality test items tend to have higher reliabilities than often assumed (typically between .60 and .70; e.g., (Henry & Möttus, 2020; Möttus, Sinick, et al., 2019)) and analyses based on comparing the properties of single items can yield meaningful results (Henry & Möttus, 2020; Möttus et al., 2020). Because CCQ items were designed to cover the space of personality traits more broadly than the currently dominant tests tailored to models such as the Big Five, our findings should be generalizable to a larger universe of personality traits than those reflected in the CCQ items.

7 | CONCLUSIONS

The present study explore whether social expectations and self-regulatory efforts are the mechanisms to explain personality change during childhood and adolescence. Our findings suggested that personality traits with the highest social expectations tend to have higher mean levels among children and adolescents, they generally do not show positive mean-level age trends during adolescence. Future longitudinal research, possibly involving alternative operationalisations of personality traits, their social expectations, and self-regulatory demands will be required to further explore the mechanisms that drive youth personality development.

AUTHOR CONTRIBUTIONS

Yuzhan Hang contributed to conceiving the study, conducted the data analysis and drafted the manuscript. Christopher Soto provided critical feedback on drafts. Billy Lee provided critical feedback on drafts. Lydia Gabriela Speyer provided critical feedback on drafts. Aja Louise Murray provided critical feedback on drafts. René Möttus provided critical feedback on drafts. All authors read and approved the final manuscript.

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CONFLICTS OF INTEREST

The authors report no conflicts of interest.

ETHICS APPROVAL

The study received ethical approval from the Ethics Committee of the School of Philosophy Psychology and Language Sciences at the University of Edinburgh.

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