

# Stability and change of basic personal values in mid-to-late adolescence: A 4-year longitudinal study



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## Abstract

This paper presents the first longitudinal examination of stability and change in the 19 values of Schwartz's refined theory. A total of  $N = 465$  high-school students (75% boys) participated in the study. The Portrait Values Questionnaire-Revised was administered four times over three years in mid-to-late adolescence (ages 15–18). We investigated multiple types of stability. At the mean level, Power-Dominance and Universalism-Nature increased significantly in importance compared to the other values. By contrast, the relative importance of Benevolence, Stimulation, Hedonism, and Face decreased significantly. Correlations between the growth parameters of the 19 values showed that change occurred in a coherent and organized manner, mirroring the circular structure of Schwartz's theory. A medium-to-high degree of rank-order consistency was observed over 3 years, with coefficients ranging from .30 (Self-Direction-Action) to .56 (Conformity-Rules). On average, overall and distinctive profile stabilities were .66 and .45, respectively. Whereas the hierarchical order of values was consistent over time for most adolescents, there were important interindividual differences in stability patterns. The results from this study are discussed and related to earlier findings on value change during adjacent developmental periods. Taken together, they contribute to drawing a roadmap of value development in late adolescence toward early adulthood.

## Plain Language Summary

This paper presents the first examination of stability and change in the 19 values of Schwartz's refined theory over three years in late adolescence (ages 15–18). A total of  $N = 465$  high-school students (75% male) participated in the study. The Portrait Values Questionnaire-Revised was administered four times, annually. We investigated multiple types of stability. On average, Self-direction-Thought, Power-Dominance, Security-Societal, and Universalism-Nature increased significantly in importance compared to the other values. By contrast, the relative importance of Benevolence, Stimulation, Hedonism, and Face decreased significantly. We observed a general tendency for motivationally compatible values to change in the same direction and for those expressing conflicting motivations to change in opposite directions. Differences between persons in the importance assigned to values are moderately stable over the 3 years of the study. The relative importance of values within an individual (i.e., the individual's value hierarchy) tended to persist over time for most adolescents. However, the degree of stability may vary considerably among individuals. Results are discussed and related to earlier findings on value change during adjacent developmental periods. Taken together, they contribute to drawing a roadmap of value development in late adolescence toward early adulthood.

## Keywords

Adolescence, change, development, stability, values

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## Introduction

Personality develops from the dynamic interplay of individuals with the social environment (Atherton et al., 2020). Late adolescence is an important period in development, as it marks a preparation for independent life, such as through education and first romantic relationships. Biological systems support this process by enhancing planning and regulation abilities (Denissen et al., 2013). Research has shown that personality traits develop in avenues that support these tasks (Roberts et al., 2005). Personal values may also undergo adaptive changes, but research on value

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development in late adolescence is currently lacking. We focus on this in the current research.

Values are abstract concepts or beliefs describing the end-states an individual aspires to achieve in life (Schwartz, 1992). They include, for example, security, independence, care for close others, and ambition. Values are an integral part of the personality (Baumert et al., 2017), as they describe the typical motivations driving individuals in their lives. Values can direct an individual's judgments and behaviors and, as a result, motivate them to tackle environmental challenges (Sagiv & Schwartz, 2022). It is thus critical to investigate patterns of change in values, in the quest to understand personality development during late adolescence.

Recent years have witnessed an increased interest in how values vary normatively, in response to age-graded influences (e.g., Daniel et al., 2013; Milfont et al., 2016), but late adolescence remains an understudied period. The present study was designed to increase our understanding of this subject, by examining stability and change of values from 15 to 18 years of age, a transition period from middle to late adolescence. We approach this in a comprehensive way. Specifically, this is the first longitudinal study to use Schwartz's (2017) refined theory of values. The theory provides the most thorough representation of universal human values to date. This enables us to investigate as-of-yet unstudied values, such as the importance of how one appears to others (Face), which is particularly meaningful in this stage of development (Sebastian et al., 2008). In addition, we operationalized change in different ways, each offering unique insights for the study of change. We also examined the roles of two key demographic variables, gender and socioeconomic status, to see if they matter in how values develop at this age. Together, the current study can enable us to draw a road map of value development toward early adulthood. Below, we describe Schwartz's theory of values and summarize what we currently know about value change during adolescence.

### Basic personal values

In its original formulation, Schwartz's (1992) theory of basic personal values identifies ten broad values: Security, Tradition, Conformity, Benevolence, Universalism, Self-Direction, Stimulation, Hedonism, Achievement, and Power. The ten values are conceived as part of an integrated system, in the form of a circular structure. Their location in this structure is based on the conflicts and compatibilities of the motivational goals they express. Adjacent or close values (e.g., Conformity and Security) express compatible motivations, whereas values located at opposite sides (e.g., Conformity and Self-Direction) express conflicting motivations (Schwartz, 2005).

Based on this dynamic structure of relations, Schwartz's values can be grouped into four higher-order dimensions: Self-Transcendence (Benevolence, Universalism) emphasizes transcending personal interests and promoting the welfare of others. Self-Enhancement (Achievement, Power) entails pursuing personal success and dominance over others. Conservation (Security, Tradition, Conformity) reflects the motivation for self-restriction and protection of

stability and predictability. Openness to Change (Self-direction, Stimulation, Hedonism) involves autonomy and receptiveness to novelty and change (Schwartz, 1992).

More recently, Schwartz et al. (2012) proposed an alternative partitioning of the circular structure into a larger set of 19 values. Of these, two (Humility and Face) were identified as distinct new values, four (Tradition, Stimulation, Hedonism, and Achievement) retained their original conceptual definition, and 13 were derived from dividing six of the original values (Security, Conformity, Benevolence, Universalism, Self-Direction, and Power) into narrower constructs. For example, Self-direction was divided into autonomy of thought and action, while Power was divided into dominance over people and control through material resources. The circular motivational continuum of the 19 values in the refined theory is represented in Figure 1. A conceptual definition of each of the 19 values is reported in the supplementary material (Table S1).

### Value development in adolescence

A few recent longitudinal studies have investigated stability and change in the mean importance of Schwartz's values throughout adolescence and the transition to young adulthood (Bacchini et al., 2023; Daniel & Benish-Weisman, 2019; Myrsky et al., 2013; Vecchione et al., 2016, 2020). Results provide an interesting, though still fragmented, body of knowledge about normative change in values. Although findings from individual studies might be limited to the specific cultural context being investigated, the obtained pattern is consistent with the social investment principle (Roberts et al., 2008; Roberts & Nickel, 2021). The principle affirms that, from the end of adolescence onward, personality changes are mostly in the direction of greater maturity, where maturity is conceptualized as becoming more socially adapted to life situations. As value research appears to suggest, the adult years are characterized by increasing levels in the socially focused values of Self-Transcendence and Conservation (Milfont et al., 2016; Smallenbroek & Stanciu, 2024; Vecchione et al., 2016). According to Schwartz (2006), these values foster harmonious social interactions by promoting supportive and cooperative relationships with others (Benevolence and Universalism) and emphasizing avoidance of conflicts and adherence to social norms and expectations (Security, Tradition, and Conformity). As reasoned by Vecchione et al. (2016), increasing the importance of these values in young adulthood may facilitate the transition to new roles and responsibilities, such as those implied in raising a family and securing a future with suitable employment. Some evidence of an increase in the values of Universalism and Security was also found at an earlier age, during the college years (Myrsky et al., 2013). However, the exact timing at which this trend becomes apparent is still unclear.

A different developmental trend was observed at younger ages, particularly in early to middle adolescence. This is a crucial period for identity development, during which individuals prioritize their needs and are generally less attentive to caring for others (Daniel & Benish-

Weisman, 2019). Self-Transcendence and Conservation values were found to be mostly stable at this age, whereas more individualistic values, such as Power, Hedonism, and Stimulation, increased significantly in importance (Daniel & Benish-Weisman, 2019; Vecchione et al., 2020). This parallels what has been found in the literature on personality traits (Van den Akker et al., 2014), where the transition into adolescence has been referred to as a temporary dip in personality maturation (Soto, 2016).

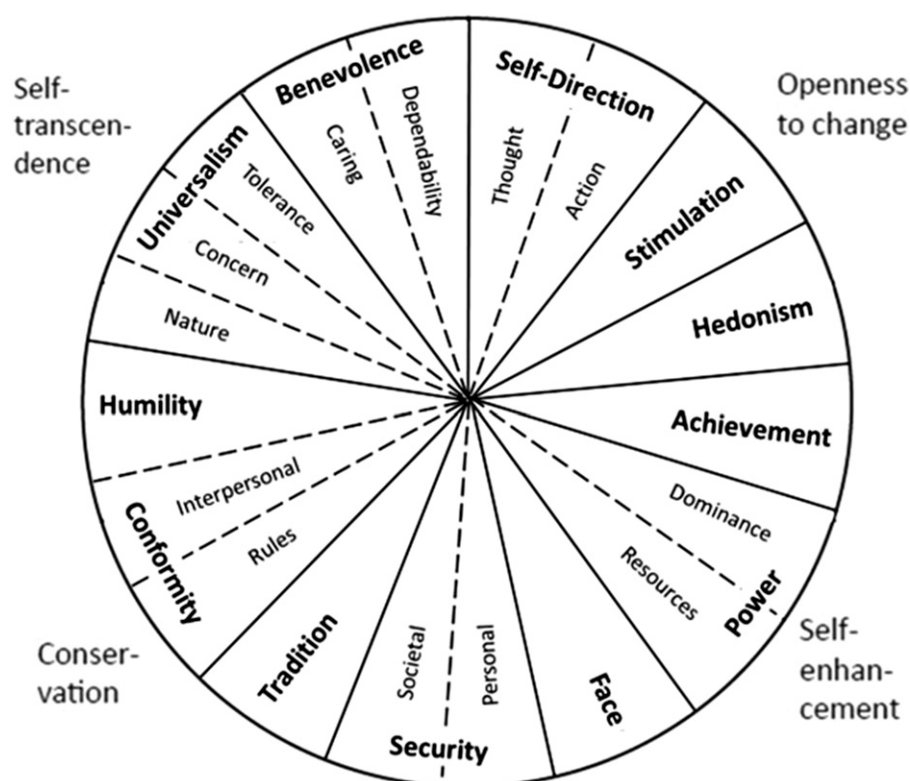
Other forms of stability and change, such as rank-order consistency and profile stability, have also been investigated (Daniel & Benish-Weisman, 2019; Myrsky et al., 2013; Vecchione et al., 2016, 2020). Rank-order consistency captures stability in differences between persons. It refers to the extent to which the relative standing of individuals in the importance assigned to a given value is maintained over time. High levels of rank-order stability occur when most individuals in the sample change similarly over time (e.g., by increasing the importance assigned to a given value by approximately the same amount). By contrast, low levels of rank-order consistency indicate that individuals tend to shift their relative position in the group in the importance they assign to a value. This may occur when individuals react differently to the same normative life event or when the event has a different timing or duration across individuals (Seifert et al., 2022).<sup>1</sup> Overall, the evidence so far suggests that rank-order stability in values tends to increase across development (Daniel & Benish-Weisman, 2019; Vecchione et al., 2016, 2020). This pattern appears to replicate an established finding in the trait literature (Bleidorn et al., 2022), namely, the fact that personality becomes increasingly stable with age

(the so-called cumulative principle of personality development).

Profile (or ipsative) stability refers to the consistency over time in the relative importance of values within an individual (i.e., the stability of the individual's value hierarchy). Although less commonly investigated, this type of stability is essential for studying the process of value development (Vecchione et al., 2016). Personal values form an ordered system of priorities within the person, from the most to the least important. It is this hierarchy that affects people's preferences, perceptions, and judgments (Roccas et al., 2017). Hence, a change in the relative priority of values within an individual is likely to be accompanied by a change in how they think and act. Data on profile stability are limited to a few studies (Dobewall & Aavik, 2016; Vecchione et al., 2016, 2020), thus preventing us from drawing general conclusions about how it varies across the development.

## The current research

Adolescence is a period of change in social, cognitive, and emotional domains in individuals' lives. This transition underscores adolescence as a pivotal stage of life for exploring, developing, and potentially revising values (Benish-Weisman, 2024). This study aims to contribute to the literature by examining value stability and change in a sample of Italian students throughout their high-school years, from ages 15–18. This is an understudied age group in value research. Daniel and Benish-Weisman (2019) examined value change during the transition from middle to high-school (ages 13–16), an adjacent period that only partially overlaps with that investigated in the present



**Figure 1.** The circular motivational continuum of the 19 values in the refined theory (adapted from Schwartz et al., 2012).

research. More recently, [Bacchini et al. \(2023\)](#) investigated how the four higher-order values changed over four waves in a sample of Italian high-school students (ages 14–17). Results have shown an increase in the relative importance of Self-Enhancement and Openness to Change, a decrease in Conservation, and stability in Self-Transcendence. To the best of our knowledge, this is the only attempt to investigate how Schwartz's values change throughout the high-school years.

Of interest, all existing studies on value change have focused on the 4 higher-order dimensions ([Bacchini et al., 2023](#); [Cieciuch et al., 2016](#)) or the 10 values of Schwartz's (1992) original theory ([Daniel & Benish-Weisman, 2019](#); [Myrsky et al., 2013](#); [Vecchione et al., 2016, 2020](#)). The present research adopted the recent refinement of the theory ([Schwartz et al., 2012](#)), which provides a finer partitioning of the circular motivational continuum. In this regard, results from several studies have shown that dividing the original broad values into narrower constructs may enhance the prediction of various outcomes (e.g., [Schwartz et al., 2012](#); [Vecchione et al., 2012](#); [Vecchione & Schwartz, 2022](#)). However, little is known about how the 19 refined values change over the life course. For example, do the different subtypes of the same broad domain change hand in hand, sharing a similar developmental pathway? Or do they follow distinct and unrelated growth trajectories? This is the first study to address this issue.

We investigated stability and change in the *relative* importance assigned to each value, compared to the others, rather than in absolute terms. We decided so because, as [Schwartz \(2012\)](#) stated, “what affects behavior and attitudes is the trade-off among relevant values, not the importance of any one value” (p. 12). Change was assessed from diverse perspectives, by adopting a similar analytical approach to that used in earlier longitudinal studies on Schwartz's values ([Daniel & Benish-Weisman, 2019](#); [Vecchione et al., 2016, 2020](#)). We first explored patterns of mean-level change in the 19 values throughout the high-school years, from ages 15–18. Whereas earlier studies have shown that values develop toward greater maturity and adjustment in young adulthood ([Smullenbroek & Stanciu, 2024](#); [Vecchione et al., 2016](#)), this is not obvious for earlier developmental periods. We explored whether first signs of change along this direction appear already in mid-to-late adolescence. We expect moderate changes during the examined period, which is characterized by a relatively stable social environment, as reflected in a structured and predictable setting, with students attending the same school throughout the study. This age period precedes major life events and social transitions, such as high-school completion and entry to work or postsecondary education, representing important sources of normative change in personality ([Roberts & Davis, 2016](#)).

In addition to addressing mean-level change of values as separate entities, we looked at the whole development structure by examining whether changes in different values are dynamically interrelated. We expect that how values change reflects the same circular structure that organizes their associations. This would extend to the refined theory

what was found for the 10 original values in a sample of adults ([Vecchione et al., 2016](#)).

We further examined the potential role of gender and parental socioeconomic status (SES) in shaping the developmental trajectory of values in adolescence. Gender differences in the importance assigned to the 10 original values are well-established ([Schwartz & Rubel, 2005](#)). Regarding refined values, recent studies have shown that, compared to men, women tend to attribute higher importance to the two Benevolence values, Universalism-Tolerance, Universalism-Concern, Security-Personal, and Face ([Schwartz, 2017](#)). The same research found that men, by contrast, attribute higher importance to Achievement, Power-Resources, and Security-Societal. We expected to replicate this pattern at the first assessment wave, when most adolescents were aged 15 or 16. Longitudinal studies, however, have found only marginal ([Vecchione et al., 2016](#)) or no differences ([Daniel & Benish-Weisman, 2019](#); [Vecchione et al., 2020](#)) between genders in the direction and amount of change across the development. In accordance with findings from these studies, we do not expect value change in middle to late adolescence to differ by gender.

In light of the pivotal role of socioeconomic background on identity formation and individual development ([Conger et al., 2010](#); [Manstead, 2018](#)), we explored the association between familial SES and adolescents' values. As [Schwartz \(2006\)](#) wrote, differences in background characteristics significantly determine the life circumstances to which people are exposed, which in turn affect their value orientations. These links have been documented in some studies. For instance, [Keijer \(2021\)](#) has shown that parental educational attainment was positively related to the importance children attribute to Self-direction and negatively related to the importance they assign to Conformity. In a similar vein, [Uzefovsky et al. \(2016\)](#) have found that children whose mothers had higher levels of education rated Openness to Change values more important than those with less educated mothers. [Schwartz \(2006\)](#) has examined empirical relations of values with household income and years of formal education in adult samples from 20 European countries. Results indicated that income correlated more strongly with Achievement, while education correlated most strongly with Self-Direction. Both background variables correlated most negatively with the Conservation values of Security, Tradition, and Conformity.

Existing evidence on the links between SES and values, however, is limited to cross-sectional data. There is a lack of longitudinal studies examining the impact of family socioeconomic background on values and value change. In keeping with findings from earlier studies (e.g., [Keijer, 2021](#); [Schwartz, 2006](#)), we expected Self-Direction and Achievement values to be positively related with parental SES at T1, while a negative relation was expected for Conservation values. Moreover, parental SES might relate to how values change and develop over adolescence. In agreement with the family investment model ([Conger & Donnellan, 2007](#)), parents living in advantaged conditions, as reflected in higher levels of education, income, and occupational prestige, are more likely to engage in cognitively stimulating activities with their children compared to families of low SES ([Conger & Dogan, 2007](#)). This may



be associated with value change, by creating an optimal socio-cultural milieu that encourages adolescents to cultivate and develop creativity, independence of thinking, and intellectual autonomy. We, therefore, expected a steeper increase over time in the importance attributed to Self-direction for adolescents from high SES backgrounds compared to those from low SES. This would be especially so for the thought facet, which emphasizes the freedom to express one's ideas and opinions (Schwartz, 2017).

In a subsequent step, we examined rank-order stability in the relative importance of each of the 19 values. We expected moderately high levels of consistency, with a tendency for stability coefficients to increase over the years of the study. This would align with the cumulative principle of personality development (Roberts & DelVecchio, 2000). Finally, we examined the degree of consistency in the hierarchical order of the 19 values within each individual and explored whether this varied over the years of the study.

## Methods

### Participants and procedures

This study is part of a longitudinal project that started in 2014 to investigate adolescents' personality development. In total, 465 students (75% boys) took part in the study. The participating students were drawn from two school districts located in Rome (Italy). As the schools were selected using convenience criteria, the sample cannot be regarded as representative of the general population of Italian high-school students. The participating students were assessed annually on four measurement occasions. The first wave ( $n = 333$ , 72% boys) took place during the second year of secondary school (T1), when most students (87%) were aged 15 or 16 (age range: 14–18,  $M = 15.49$ ,  $SD = .79$ ). There was a predominance of boys in the sample, most likely because the study involved scientific and technical high-schools, where girls are underrepresented (Berra & Cavaletto, 2020). The other waves were collected during the third (T2,  $n = 320$ ), fourth (T3,  $n = 214$ ), and fifth (T4,  $n = 236$ ) year. A total of 328 students (71%) provided data on at least two waves of data collection, 207 (45%) provided data on at least three waves, and 101 (22%) participated in all four waves. Sample size declined over the four measurement occasions as some students dropped out of the study. Moreover, eight classes at T3 and nine at T4 were unavailable for the data collection.

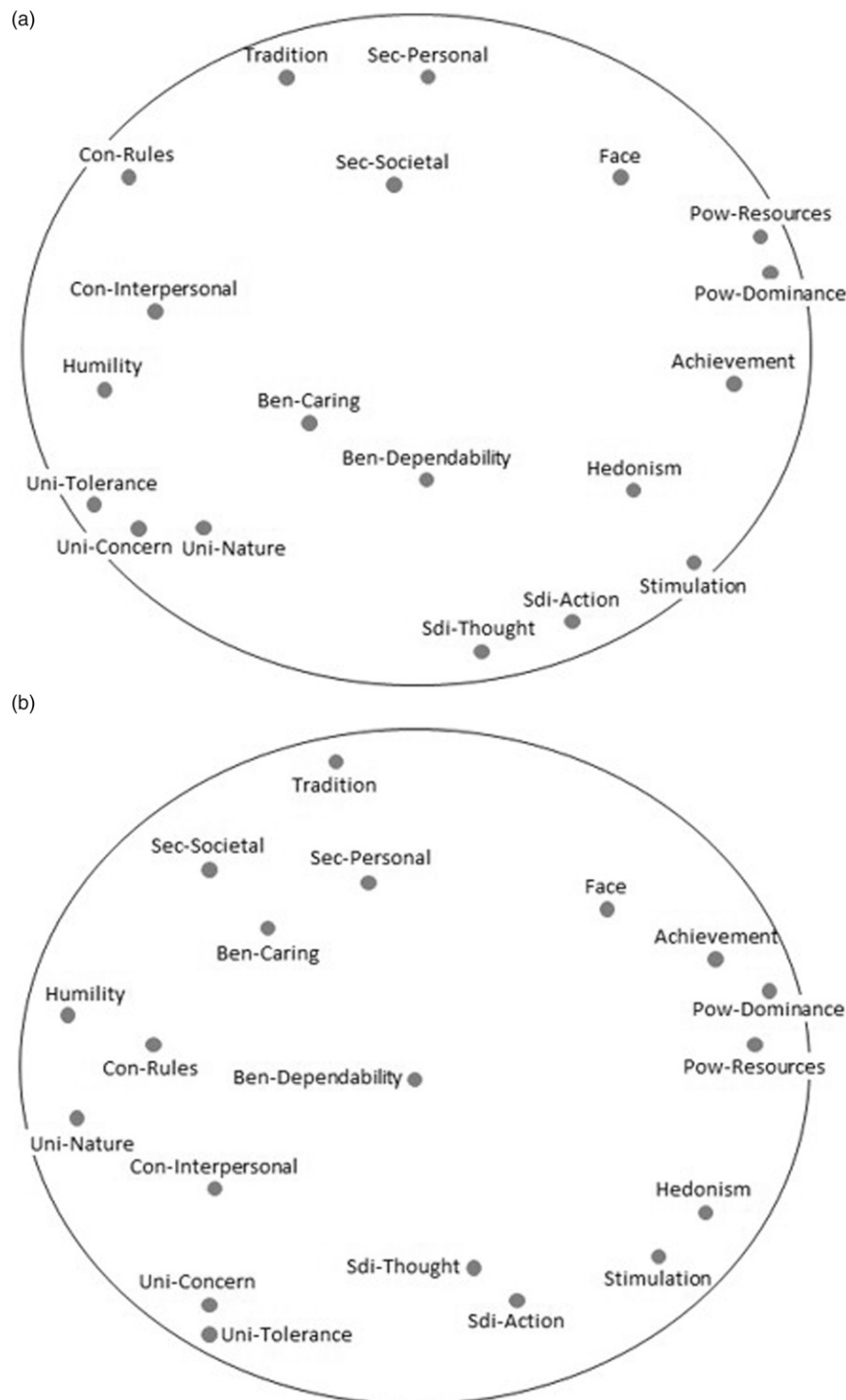
Students completed a self-report questionnaire at each assessment wave, which included the PVQ-RR, basic demographic information (age and gender), and other instruments unrelated to the present study. Moreover, participants at T1 were asked to report on family income, education, and occupation. The annual net household income ranged from “11,000–15,500€” (2.7%) to “more than 58,000€” (6.3%), with the modal category being “27,000–32,000€” (25.5%). The economic condition of the sample is similar to that of the Italian general population in 2014, the year of the first assessment wave, when the annual household income was 29,472 Euros on

average (ISTAT, 2016). Father's and mother's highest level of completed education were, respectively, as follows: elementary school 2.7 and 1.8%, middle school 24.6 and 20.1%, high-school 50.5 and 54.4%, and university degree 22.2 and 23.7%. Employment rates for respondents' fathers and mothers were 97 and 78%, respectively. The questionnaire was administered in classes by a trained researcher. All students were informed about the study and were free to participate. The study and hypotheses were not preregistered. A comparison between attrited and non-attrited participants indicated that, compared to those with incomplete data, the students who participated at all waves had more educated mothers,  $\chi^2(4) = 19.34$ ,  $p < .001$ ,  $\phi = .24$ , and were more likely to be girls,  $\chi^2(1) = 22.74$ ,  $p < .001$ ,  $\phi = .22$ . Moreover, they assigned significantly higher importance to Benevolence-Dependability,  $F(1,329) = 12.15$ ,  $p = .01$ ,  $\eta^2 = .04$ , Universalism-Tolerance,  $F(1,329) = 9.02$ ,  $p = .01$ ,  $\eta^2 = .03$ , and Universalism-Concern,  $F(1,329) = 8.67$ ,  $p = .02$ ,  $\eta^2 = .03$ , and lower importance to Tradition,  $F(1,329) = 12.02$ ,  $p = .01$ ,  $\eta^2 = .03$ .

### Measures

**Basic values.** We measured basic values with an Italian adaptation (Vecchione & Alessandri, 2017) of the PVQ-RR (Schwartz et al., 2012). The instrument includes 57 items for the assessment of the 19 values described in Schwartz's (2017) refined theory. Each item represents a short verbal portrait that describes a person's goals, wishes, or aspirations. Respondents were asked to indicate how similar the described person is to themselves on a six-point scale, from “not like me at all” to “very much like me.” Cronbach's alpha reliability coefficients at T1 ranged from .45 (Security-Personal) to .89 (Universalism-Nature) ( $M = .70$ ,  $SD = .12$ ). Coefficients were higher than .60 for 16 out of 19 values. Security-Personal (.45), Humility (.47), and Achievement (.51) showed the lowest alpha coefficients. An MDS analysis was performed on the 19 centered values at T1, using the PROXSCAL algorithm. As shown in Figure 2(a), the location of the 19 values was consistent with the theoretical structure.

**Socioeconomic status.** A composite index of parental SES was developed based on students' self-reported household income and parental (father and mother) education and occupational status (Baker, 2014). Data on occupation and employment status were coded by the first author into four ordered categories, based on occupational prestige: unskilled (e.g., cashier), semi-skilled (e.g., salesman), skilled (e.g., trade worker), and highly skilled (e.g., engineer). Unemployed parents were classified in the first category. The percentages of respondents in the four categories were 11.4, 53.8, 22.5, and 12.3% for fathers, and 35.7, 42.0, 15.9, and 6.3% for mothers. A principal component analysis (PCA) on the five SES indicators yielded a unidimensional structure.<sup>2</sup> The component scores derived from the PCA were used as a composite index of parental SES, with higher scores indicating higher SES.



**Figure 2.** Multidimensional Scaling of the 19 values of the refined theory: (a) a (static) representation of the relative importance of the 19 values at the first wave and (b) a (dynamic) representation of the rate of change in the relative importance of the 19 values. *Note.* Sec = Security; Con = Conformity; Ben = Benevolence; Uni = Universalism; Sdi = Self-Direction; Pow = Power.

*Gender.* We coded gender as 0 for boys and 1 for girls.

### Analytical approach

Preliminary analyses assessed the longitudinal measurement invariance of the Portrait Values Questionnaire-Revised (PVQ-RR) using confirmatory factor analyses (CFA). This is an important precondition for the analysis of change (Chan, 1998). Invariance was tested at increasingly

restricted levels for each value separately. A configural model positing a single factor model with three items each was estimated at all measurement occasions simultaneously. The tenability of equality constraints introduced for testing invariance of factor loadings (metric) and item intercepts (scalar) was tested by examining changes in the Comparative Fit Index (CFI), the Root Mean Square Errors of Approximation (RMSEA), and McDonald's Non-Centrality Index (MNCI).<sup>3</sup> Analyses were based on

centered scores, obtained by subtracting the individual's mean score across all PVQ-RR items from each item's score. This converts absolute importance ratings into scores that reflect relative importance (Schwartz, 2016).

Mean-level change was investigated using latent growth curve (LGC) models. Specifically, we tested a second-order growth model with multiple indicators (i.e., the PVQ-RR items) at each measurement occasion. This approach, referred to as a *curve of factors* (McArdle, 1988), incorporates tests of longitudinal invariance in the measurement part of the model. This allows modeling change at the level of latent factors, which are theoretically free of measurement error (Ferrer et al., 2008).

We tested two competing LGC models for each of the 19 values. Both models included two correlated latent factors, the intercept and the slope, representing the importance attributed to a given value at T1 and the rate of change from the first to the last wave, respectively. Model 1 posited a linear pattern of change with systematic variability around the average trajectory. Model 2 leaves the form of the growth unspecified, allowing to capture nonlinear patterns of change. The fit of the two models was compared through the Yuan and Bentler scaled chi-square difference test (Asparouhov & Muthén, 2006) and the Bayesian Information Criterion (BIC, Raftery, 1995).

Once the shape of the curves was established, the growth parameters from best-fitting models (i.e., intercept and slope) were examined. When based on centered items, a positive intercept mean indicates that the importance attributed by individuals in the sample to a given value at T1 (e.g., Achievement) is higher than the average importance they attributed to the other values. To give an example, an intercept mean of 1 for the Achievement factor indicates that the mean rating of this value is 1 unit higher than the mean rating of all values. By contrast, a negative mean indicates that the importance attributed to Achievement is below the overall mean importance. What does average change tell us, when applied to centered data? Continuing with the example, a positive slope mean of the Achievement factor indicates that the importance attributed to this value has increased more than the overall mean importance. A mean of 1 implies that the mean rating of Achievement is increased by 1 unit more than how the overall importance of values has changed. A near-zero (nonsignificant) change indicates that the mean rating of Achievement has changed approximately in the same way as the other values did on average.

To examine the role of gender and parental SES as predictors of value change, both variables were included as time-invariant covariates of the growth parameters (i.e., intercept and slope). For all the above analyses, the significance level was calculated using the Benjamini and Hochberg (1995) procedure, which adjusts for type-I error rate inflation in multiple testing. Analyses were performed with Mplus 8.7 using the robust maximum likelihood (MLR) estimator (Muthén & Muthén, 2017). Missing data were handled through full information maximum likelihood (FIML).<sup>4</sup>

To investigate the structure that underlies value change, we examined the pattern of associations between the rate of growth in the 19 values. To this aim, we estimated the slope factor scores from the best-fitting LGC models. These

scores represent the individual's predicted change in each value from the first to the last occasion. The correlation matrix between the 19 slope factor scores was obtained and subjected to an ordinal multidimensional scaling (MDS), using the PROXSCAL procedure in SPSS (Borg & Groenen, 2005). This provides a spatial representation wherein values that change in the same direction (i.e., whose slopes are positively correlated) are located close in the space. By contrast, values that change in opposite directions (i.e., whose slopes are negatively correlated) are far apart. Following Bilsky et al. (2011), we specified a starting configuration by assigning coordinates to all values in a two-dimensional space, based on their theoretically predicted location (see Figure 1).

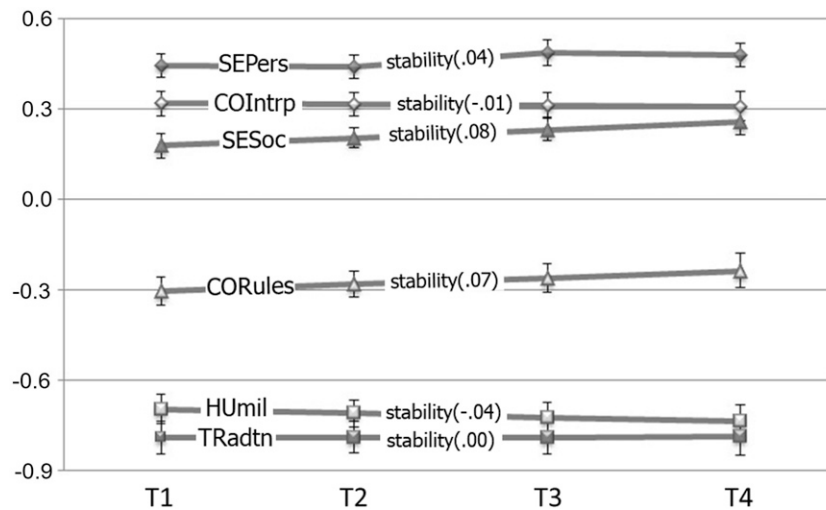
Rank-order and profile stability were examined between adjacent measurement occasions (i.e., T1–T2, T2–T3, and T3–T4) and over the whole study period (i.e., T1–T4). Rank-order stability was assessed by calculating the Pearson correlation between centered scores of the same value type measured on different occasions. This reflects the extent to which the rank-ordering of individuals in the importance assigned to a given value, *relative to others*, is maintained over time.

Profile stability (the stability of the value hierarchy) was assessed through within-person correlations. Specifically, Pearson correlations between the relative importance assigned to the 19 values at different time points were calculated for each participant. Using centered or uncentered scores in this analysis does not change the ordering of values within the individual, thus leading to the same results. We, therefore, used the uncentered scores. As the correlations between raw profiles might be inflated by the degree to which they tend to be similar to the average participant (the so-called “normativeness problem”; Furr, 2008),<sup>5</sup> distinctive profile correlations were also obtained. Based on Furr's (2008) recommendations, correlations were calculated after subtracting the normative (i.e., average) profile from each raw profile. Results reflect stability in distinctive values, namely, in how the individual is above or below average on each value. Whereas the overall (raw) profile was used in previous studies on value change (Vecchione et al., 2016, 2020), this is the first study to address temporal stability in distinctive value profiles. To investigate whether the consistency in the value hierarchy varied over the years of the study, we performed a repeated measures ANOVA, with stability coefficients as the dependent variable and time as a within-subjects factor.<sup>6</sup>

## Results

### Descriptive statistics

The means and standard deviations of the 19 centered values were calculated at each assessment wave and reported in the online supplementary material, along with the effect size of change (Table S2). Bivariate correlations among the 19 values at the first wave were also reported (Table S3). Looking at the relative importance of values at T1, we found that Benevolence-Caring and Benevolence-Dependability values were the most important, followed by Hedonism, Self-direction-Action, Self-direction-Thought, and Universalism-Concern. Tradition and the two power



**Figure 3.** Estimated growth trajectories for Conservation values. *Note.* The means of the slope factor are reported in parentheses. \* $p < .05$ , \*\* $p < .01$ . SEPers = Security-Personal, SESoc = Security-Societal, TRadtn = Tradition, CORules = Conformity-Rules, COIntrp = Conformity-Interpersonal, HUMil = Humility.

subtypes were rated as the least important, with Power-Dominance last. This largely replicates the hierarchical order found with both the original 10 (Schwartz & Bardi, 2001) and the 19 refined values (Schwartz & Cieciuch, 2022) in adult samples from a large number of countries, where Benevolence values were consistently at the top of the hierarchy, with Self-direction and Universalism close behind. An apparent exception is Hedonism. This value is generally in the middle or at the bottom of the value hierarchy among adults. However, it is rated as among the most important in samples of adolescents of various ages (Daniel & Benish-Weisman, 2019; Tulviste & Tamm, 2014).

### Longitudinal measurement invariance of the PVQ-RR

The configural invariance models provided a good fit for all values. One item of the achievement value was excluded from the analysis as it was uncorrelated with the other two PVQ-RR items. Full metric invariance over repeated measurements was supported for all PVQ-RR scales except for Benevolence-Dependability. This value exhibited partial invariance after freeing one noninvariant loading. Full scalar invariance was supported for 7 of the 19 values (Security-Personal, Tradition, Conformity-Interpersonal, Universalism-Concern, Universalism-Tolerance, Achievement, Power-Resources). Partial scalar invariance for the other 12 values was achieved by releasing one to three equality constraints. Overall, the proportion of noninvariant parameters is relatively small (.04% for loadings, 11.16% for intercepts). Therefore, measurement invariance appears to hold at least approximately in the data. More detailed results are reported in [supplemental Table S4](#).

### The developmental trajectory of values in middle to late adolescence

The goodness of fit of the two competing models (linear vs. nonlinear) and the results of model comparisons are provided in [supplemental Table S5](#). The estimated growth

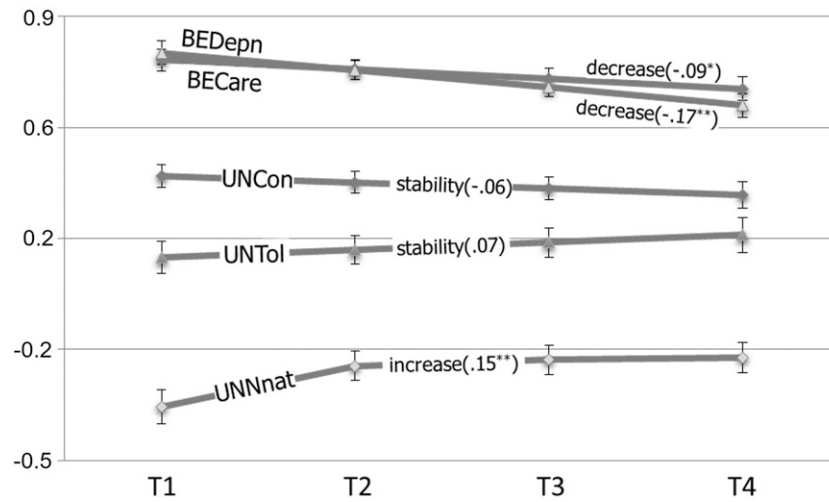
trajectories for the relative importance of the 19 values, grouped by higher-order dimensions, are displayed in [Figures 3–6](#) (with error bars representing the standard error). Seven value dimensions changed significantly in importance from the first to the last wave, as attested by the significant mean of the slope factor. Specifically, an increasing trend was observed for Power-Dominance and Universalism-Nature, while Benevolence-Caring, Benevolence-Dependability, Stimulation, Hedonism, and Face decreased in importance. All values followed a linear trend, except for Security-Personal and Universalism-Nature, which showed moderate deviations from linearity. Security-Personal was stable from T1 to T2, increased slightly from T2 to T3, and remained stable thereafter. The overall increase, however, was not statistically significant. Universalism-Nature increased at each wave, but the increase was more pronounced in the first part of the curve.

The estimated variances of the 19 intercept factors were all significantly different from zero ( $ps < .05$ ). This denotes significant interindividual differences in the importance attributed to each value at T1. The variances in the slope factor were significant ( $ps < .05$ ) for 7 out of 19 values (Tradition, the three Universalism values, Stimulation, and the two Power values). Other 7 values (Security-Personal, Humility, Benevolence-Caring, Benevolence-Dependability, Self-Direction-Action, Hedonism, and Face) showed a statistical trend ( $ps < .10$ ). Covariances between intercept and slope factors were all negative except for the Conformity values, and statistically significant in three cases (Universalism-Nature, Power-Dominance, and Power-Resources). This indicates that the initial importance assigned to values tends to be inversely related to the amount of change. The parameter estimates (with 95% confidence intervals) of the best-fitting LGC model for each of the 19 values are reported in [supplemental Table S6](#).

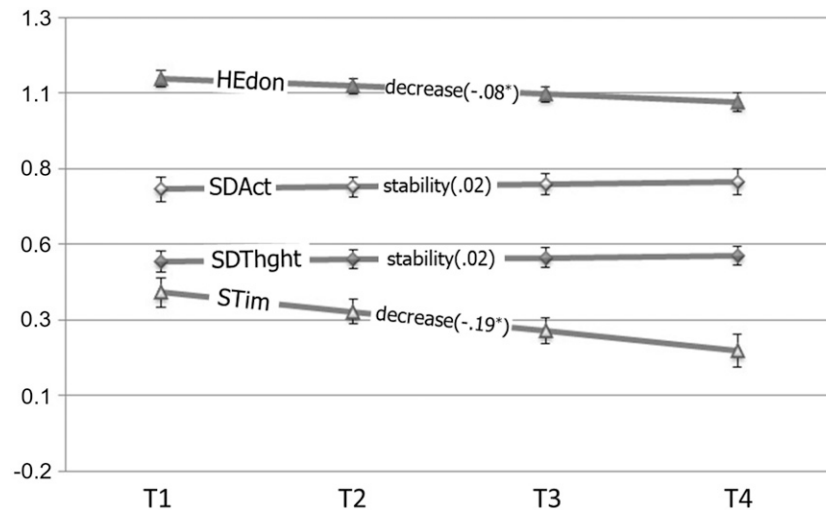
### The structure of value change

The MDS plot representing the slope factors of the 19 values is provided in [Figure 2\(b\)](#). Note that the points in this

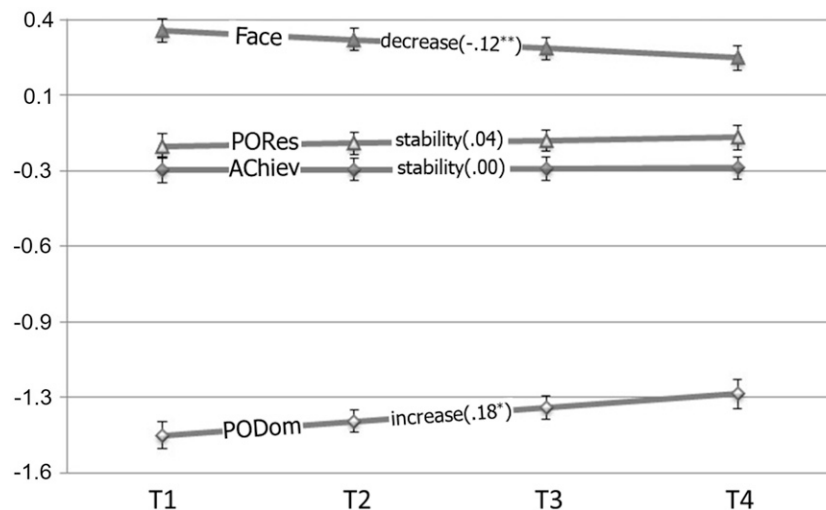




**Figure 4.** Estimated growth trajectories for Self-Transcendence values. *Note.* The means of the slope factor are reported in parentheses. \* $p < .05$ , \*\* $p < .01$ . BECare = Benevolence-Caring, BEDepn = Benevolence-Dependability, UNCon = Universalism-Concern, UNNnat = Universalism-Nature, UNTol = Universalism-Tolerance.



**Figure 5.** Estimated growth trajectories for Openness to Change values. *Note.* The means of the slope factor are reported in parentheses. \* $p < .05$ , \*\* $p < .01$ . SDThght = Self-direction-Thought, SDAct = Self-direction-Action, STim = Stimulation, HEdon = Hedonism.



**Figure 6.** Estimated growth trajectories for Self-Enhancement values. *Note.* The means of the slope factor are reported in parentheses. \* $p < .05$ , \*\* $p < .01$ . AChiev = Achievement, PODom = Power-Dominance, POREs = Power-Resources.

plot do not represent the importance assigned to each value at a given point in time, in a static way. Instead, they represent how values change from the first to the last measurement occasion. Their relative positions reflect the dynamic associations between rates and direction of change in different values. As shown, the 19 values changed in a way that is consistent with the value circle. The points in the plot, indeed, form a circular-like pattern that is structurally similar to that obtained for the importance assigned to the 19 values at T1 (Figure 2(a)). The Pearson correlation between the coordinates of the two MDS solutions was .96 for the first and .83 for the second dimension. This suggests a general tendency for motivationally compatible values to change in the same direction and for those expressing conflicting motivations to change in opposite directions.

A closer inspection of the pairwise correlations between the slopes provides further information about whether the subtypes of the original values co-develop over time. We found that the slope factor scores of the two refined values within each of the following value types correlated positively and significantly: Self-direction values ( $r = .39, p < .001$ ), Power ( $r = .36, p < .001$ ), Benevolence ( $r = .23, p < .001$ ), Conformity ( $r = .19, p < .001$ ), and Security ( $r = .13, p = .01$ ). Moreover, the slope of Universalism-Concern correlated positively with that of Universalism-Tolerance ( $r = .34, p < .001$ ). Therefore, for each of these pairs, an increase in the importance of one value was accompanied by an increase in the importance of the other. By contrast, the rate of change in Universalism-Nature did not correlate significantly with those of Universalism-Tolerance ( $r = .06, p = .37$ ) and Universalism-Concern ( $r = .05, p = .46$ ). The full correlation matrix on which the MDS solution was based is provided in supplemental Table S7.

### Gender and SES as predictors of adolescents' values and value change

When included in the LGC models, gender correlated significantly with the intercept factor of 6 values. At T1, boys attributed greater importance to Power-Resources ( $b = -.66, p < .001$ ), Power-Dominance ( $b = -.62, p < .001$ ), and Achievement ( $b = -.68, p < .001$ ) than girls did. By contrast, girls attributed greater importance to Universalism-Concern ( $b = .45, p < .001$ ), Universalism-Tolerance ( $b = .60, p < .001$ ), and Humility ( $b = .23, p = .04$ ). Nonetheless, gender did not exert significant effects on the slopes of the 19 values. This indicates that the developmental trajectories of values were not significantly different for boy and girl adolescents.

Parental SES related positively to the intercept of 3 values. The higher the SES, the higher the importance assigned at T1 to Achievement ( $\beta = .22, p < .001$ ) and Self-direction-Thought ( $\beta = .07, p = .04$ ), the lower the importance assigned to Tradition ( $\beta = -.14, p < .001$ ). In contrast to our expectations, however, parental SES did not predict the rate of change in Self-direction or any of the other values. Thus, the relative importance of the 19 values did not change differently across SES backgrounds. Further details on the conditional growth curve models, including goodness of fit indices and parameter estimates, are reported in supplemental Table S8.

### The rank-order consistency of the 19 refined values

Rank-order stability coefficients for the 19 values are shown in supplemental Table S9. Coefficients between adjacent measurement occasions averaged .53 from T1 to T2, .59 from T2 to T3, and .65 from T3 to T4. We, therefore, observed a slight tendency for stability coefficients to increase with age. Descriptively, all coefficients were higher between T3 and T4 than between T1 and T2. Coefficients over the 3-year study period (i.e., between T1 and T4) ranged from .30 (Self-Direction-Action) to .56 (Conformity-Rules), with a mean of .44 ( $SD = .08$ ).

### The stability of the value hierarchy

The within-person correlations between value hierarchies (overall profile stabilities) assessed at adjacent time points (1 year apart) were in the range of  $-.22$  to  $.96$  from T1 to T2 ( $M = .71, SD = .19$ ),  $-.20$  to  $.97$  from T2 to T3 ( $M = .77, SD = .17$ ), and  $-.18$  to  $.96$  from T3 to T4 ( $M = .80, SD = .16$ ). Stability coefficients increased significantly across waves,  $F(2,200) = 10.10, p = .001, \eta^2 = .09$ . Correlations between value hierarchies assessed in the first and last waves (3 years apart) ranged from  $-.22$  to  $.94$ , with a mean of  $.66$  ( $SD = .23$ ). Coefficients were greater than .56 for 75% of respondents and smaller than .15 for 5% of respondents. Regarding profile normativeness, coefficients at T1 ranged from  $-.54$  to  $.94$ , with a mean of  $.65$  ( $SD = .21$ ). Similar results were observed at subsequent measurement occasions, with means ranging from .61 (T4) to .67 (T3). The normative value hierarchy, as discussed in the descriptive statistics and reported in Table S2, showed that Benevolence, Hedonism, and Self-Direction were most important, while Tradition and Power were least important. After removing the normative component, the average distinctive profile stability across the three years of the study decreased to .45 ( $SD = .27$ ). The whole pattern of overall and distinctive stability and within-time normativeness are provided in supplemental Table S10.

## Discussion

The present study was the first to illuminate patterns of stability and change of the 19 values in Schwartz's (2017) refined theory over three years during mid-late adolescence. We utilized multiple levels of analysis, each providing distinct information about whether, how, and to what extent values change over time. For each level, we discuss the main results in consideration of the examined age period and interpret them in the context of existing studies.

### Changes in mean levels of values

First, we investigated change at the mean level, using LGC modeling. This allows us to answer questions like: "What are the normative (i.e., typical) developmental trends that occur for personal values during the examined age period?". We observed significant mean-level changes in the relative importance attributed to several values. Specifically, Power-Dominance and Universalism-Nature increased significantly in importance compared to the other values. By

contrast, the relative importance assigned to the two Benevolence values, Stimulation, Hedonism, and Face decreased significantly. The relative importance attributed to the other values did neither increase nor decrease significantly.

The developmental period under study, as the entire period of adolescence, is characterized by a progressive interest in pursuing social status and popularity (Veenstra & Laninga-Wijnen, 2023). As argued by several scholars (e.g., Hawley et al., 2007; Jonkmann et al., 2009), there is considerable overlap between popularity and social dominance in the adolescent years. Popularity at this age has been referred to as the adolescents' standing in the group hierarchy, based on levels of influence and dominance over peers (Koski et al., 2015; Marks et al., 2012). The view of adolescence as a time of increased search for popularity is highly compatible with the growing importance that we have observed for power through exercising one's control over people (Power-Dominance). By contrast, power through the control of material resources (Power-Resources) did not increase in importance. As Jonkmann et al. (2009) wrote, "In adolescence, young people no longer tend to compete for material objects, such as toys, but for social resources, such as attention and influence" (p. 339).

Results from the present study are consistent with earlier longitudinal studies showing that social dominance, a trait that includes aspects like independence, dominance, and self-confidence (Roberts, 2006), appears to exhibit an increased developmental trajectory in adolescence (e.g., Roberts et al., 2006). They also align with recent findings showing rising levels of Self-Enhancement values among high-school adolescents (Bacchini et al., 2023) and with studies at earlier ages, showing an increase in the broad Power value during the junior high-school years (Vecchione et al., 2020) and in the transition to high-school (Daniel & Benish-Weisman, 2019). Our results add to these findings by suggesting that the increase in these values throughout the high-school years is due predominantly to Power-Dominance.

The concomitant decrease observed in the importance assigned to the conflicting values of Benevolence-Caring and Benevolence-Dependability is consistent with the circular structure implied in Schwartz's theory. This decrease is likely to reflect the heightened focus on the self that characterizes the period of adolescence (Crone & Fuligni, 2020). By contrast, we observed no change in the other Self-Transcendence values and in Conservation values, with the interesting exception of Universalism-Nature, which we discuss later. What do we know from existing studies on how Self-Transcendence and Conservation values develop in adolescence? A study with Italian early adolescents (Vecchione et al., 2020) showed a pattern of substantial stability in all of these values from 12 to 14 years of age. A similar trend, except for a slight decrease in Tradition, was observed in an Israeli sample from ages 13 to 16 (Daniel & Benish-Weisman, 2019). An Italian study (Bacchini et al., 2023) reported decreases in Conservation and stable levels of Self-Transcendence from 14 to 17 years of age. It is unclear, however, which pattern holds for the narrower values that form the two higher-order dimensions.

In sum, our results, combined with those of earlier studies, reveal that Benevolence values tend to remain constant in early to middle adolescence, decreasing thereafter, from mid-late adolescence. Universalism values appear to follow a stable trajectory from early to late adolescence. Conservation values have a less predictable pattern, showing a mixture of either declining or stable trajectories. These results, along with the increased importance of Power, are at odds with the view of values as becoming increasingly mature in late adolescence. Presumably, increases in the importance of Conservation and Self-Transcendence values become apparent only after the school years, as a result of the individual's adjustment to adult life. As shown in earlier studies, a different trend appears to emerge as the end of adolescence approaches. Increasing levels of Universalism and Security, with no changes in Benevolence, Conformity, and Tradition, were observed during the transition to emerging adulthood in a Finnish sample of university students (Myyry et al., 2013). In line with the social investment principle, a more robust increase, generalized to all Self-Transcendence and Conservation values, was observed in later years in a sample of Italian young adults (Vecchione et al., 2016).

As anticipated, we found that, differently from the other universalism values, the importance assigned to protecting the environment (Universalism-Nature) increased. Such a result might reflect a developmental trend that leads individuals to enhance their awareness of environmental issues as they grow older. This might be especially true during adolescence, when people become more embedded in society (Schwartz et al., 2012), and emerging abilities for abstract thinking lead to increasingly complex ways of understanding the social world (Gotlieb et al., 2024). The increased importance assigned to Universalism-Nature, however, was not necessarily the result of how values change across the developmental ages. Instead, it might reflect what has been referred to as a normative history-graded influence (Baltes, 1987), such as that experienced at a certain period in a given society. Environmental problems like air pollution and climate change have been an increasing concern worldwide in recent decades, especially among the young (Poortinga et al., 2023). Italy was no exception (Lampert, 2021). It can be speculated that these circumstances might have increased the importance assigned to care for the environment. Of course, with the data at hand, we cannot discern whether the increase in these values was due to age- or history-graded influences. Further studies are needed to address these issues more in depth.

We observed mean-level decreases in Hedonism and Stimulation. To our knowledge, the earliest age at which Hedonism and Stimulation were measured is 7 years (Daniel et al., 2023). At this age, Hedonism was third in the average hierarchy of values. Its importance increased over time, reaching second place at age 10, thus at the onset of puberty. Stimulation was consistently in the middle of the value hierarchy. In another study (Vecchione et al., 2020), both values were particularly important at 10 years. Hedonism exhibited the highest importance rating across the ten values, while Stimulation occupied the third place. The two values increased significantly in importance throughout middle school, until 12 years, when they were ranked first

and second, respectively. In the study by Daniel and Benish-Weisman (2019), Hedonism and Stimulation were found to not change significantly from 13 to 16 years. Hedonism maintained the highest mean rating throughout the study waves, while Stimulation was sixth. In our study, Hedonism was third out of 19 values in the first assessment wave, declining progressively to the fifth position in the last wave. Stimulation dropped from the 6th to the 11th position. Taken together, these findings suggest that middle adolescence is the normative age where Hedonism and Stimulation reach their highest importance, after which they start to decrease. As values that promote the pursuit of pleasure and excitement may distract from learning (Vecchione & Schwartz, 2022), reducing their importance while approaching school graduation fits with the societal expectation of being a reliable student. This may also reflect maturational changes in brain structure and function, particularly those of the prefrontal cortex, a region involved in self-regulation abilities (Somerville et al., 2010; Steinberg, 2008).

We also observed a mean-level decrease in Face, a value expressing the goal of maintaining one's public image and avoiding humiliation (Schwartz, 2017). At first glance, this may appear as a counterintuitive finding. Indeed, adolescence is a period of increasing preoccupations with social acceptance and reputation (Sebastian et al., 2008), especially among the peer group (Steinberg, 2002). An exaggerated concern and sensitivity to others' views of oneself, the so-called imaginary audience, is part of adolescent egocentrism (Elkind, 1967). Past studies, however, seem to suggest that this tendency increases during early adolescence, peaks in middle adolescence, and starts to decrease thereafter, during later adolescence (Elkind & Bowen, 1979; Enright et al., 1980; but see also Frankenberger, 2000). This is consistent with the decreasing trend we observed from 15 to 18 years in the importance assigned to the motivational goal of preserving one's reputation.

The present longitudinal study is the first to include Face. Hence, we don't know how the importance assigned to this value changes during other developmental periods. Some hints, however, can be obtained through a comparison with earlier cross-sectional studies that looked at the relative importance of the 19 values at different ages. In our sample, Face occupied the seventh place of the value hierarchy at the first measurement occasion. In a recent study based on samples of adults from 49 different cultures (Schwartz & Cieciuch, 2022), it was in the 11th position. This might suggest that middle adolescents consider Face a more important value than adults do. Presumably, its importance tends to decrease in later years, as part of the normative transition from late adolescence to adulthood.

All in all, results on mean-level changes in the 19 values confirm the utility of dividing the broad values into their refined components. Although the importance assigned to different subtypes develops in the same direction for most of the original ten values (e.g., Benevolence-Caring and Benevolence-Dependability), this is not always the case. Focusing on more specific values, we were able to find differentiated patterns of development that cannot be captured by using the broader values of the original theory.

For example, whereas Universalism-Nature increased in importance from 15 to 18 years of age, possibly relating to climate change concerns (Poortinga et al., 2023), Universalism-Concern and Universalism-Tolerance did not change significantly during the same period. Similarly, Power-Dominance increased significantly in importance, while Power-Resources did not, in line with developmental trends in this age period (Veenstra & Laninga-Wijnen, 2023). This adds nuances to our understanding of how basic personal values change throughout life.

The findings we have discussed so far provide information on the direction toward which values develop. Another relevant issue concerns the magnitude (i.e., amount) of change. In this regard, our data showed that 7 out of 19 values changed significantly over the three years of the study. The standardized mean difference (Cohen's  $d$ ) for these values ranged from .18 (Universalism-Nature) to .43 (Face), with an average of .30. The average  $d$  across all the 19 values was .16. When taken together, these results tell us that change was observed for less than half of the examined values and, when occurred, its magnitude was in the small range.

How does this compare with the amount of mean-level change observed in other developmental periods? The average Cohen's  $d$  for change across the 10 values in a sample of young adults (Vecchione et al., 2016) was .23 at eight years of distance and .15 four years apart. Cohen's  $d$  averaged .14, .10, and .15 over 2 years of early adolescence (Vecchione et al., 2020) and 3 years in middle (Daniel & Benish-Weisman, 2019) and late adolescence (Myrsky et al., 2013), respectively. As a whole, normative mean-level change in values appears to be of similar magnitude across the examined developmental periods. Probably, however, change arises from different sources at different ages. For example, whereas the investment in new social roles and responsibilities are important causes of value change in early adulthood, the social and psychological effects of puberty and the process of identity formation are likely to play major roles in adolescence.

### *Moving beyond the mean: Amount and pattern of individual differences in change*

The pattern of mean-level changes in the 19 values, as reported in the previous paragraphs, was not always consistent with the circular structure. As expected by the theory, the conflicting Power-Dominance and Benevolence values changed in opposite directions, but this does not hold for the other Self-Enhancement and Self-Transcendence values. Openness to change values decreased (Stimulation and Hedonism) or remained stable (Self-direction). The opposing values of Conservation also exhibited stability. Focusing on average trends, however, is not an appropriate approach for testing the expected structure as it does not permit modeling the variability in patterns of change. We found interindividual differences in the initial importance assigned to values and in the amount and direction of change. We sought to determine whether this variability was shared among different values. As expected, we found that the 19 values changed in a predictable and organized manner, which follows their pattern of conflicts and



compatibilities. For example, as Hedonism values increased in importance, there was a concomitant increase in the compatible values of Stimulation, while the conflicting Conformity values tended to decrease. Such a structure of change allows the stability of the whole system to be preserved in the long run. This pattern of association cannot be captured by looking at mean-level changes, which may hide processes that occur at the intraindividual level. As an example, although the average trend was estimated to be different for Power-Dominance (increasing) and Power-Resources (stable), the two development trajectories were positively interrelated across the sample (i.e., adolescents who increased over time in one value tended to increase in the other as well).

A further interesting finding, as reflected in the negative association between initial value importance and value change, is that the more distant the adolescents are from the “typical” (average) developmental stage, the more change toward the mean they have experienced, in a kind of “catching up” process of change.

### *The role of gender and parental SES*

We examined whether between-person differences in value change can be predicted by socio-demographic variables, including adolescents’ gender and parental SES. We found that, at the first measurement occasion, when most participants were aged 15 years, boys assigned greater importance than girls to Power-Resources, Power-Dominance, and Achievement. Girl adolescents, by contrast, attributed greater importance than boys to Universalism-Concern, Universalism-Tolerance, and Humility. This aligns with our hypothesis and with past findings showing consistent gender differences in values that promote personal success and social status versus those that entail transcending selfish interests for the sake of others (Schwartz & Rubel, 2005). Nonetheless, the way values changed over time did not vary by gender. Thus, the differences between boys and girls observed in the first wave were maintained throughout the examined period. Earlier studies found similar results at different ages (Vecchione et al., 2016, 2020). In sum, there is no evidence so far in the literature concerning the effect of gender on the timing with which personal values change or develop across the lifespan.

Parental SES was significantly associated with the importance ratings of several values at T1. Compared to those with lower SES, adolescents from more advantaged families assigned higher importance to Self-direction-Thought and less importance to Tradition. These results are in line with our predictions and corroborate earlier findings on the role of familial educational background in orienting children’s emphasis on autonomy versus conservation (Keijer, 2021). Also as expected, parental SES was positively related to Achievement. We know from earlier studies that high-income levels are positively related to valuing achievement in the adult population (Schwartz, 2006). Our data add to this by suggesting that adolescents with higher parental SES are more inclined to prioritize achieving personal success. This is especially interesting as the direction of the association between values and income in the adult population is unclear. Values may drive adult

individuals to pursue higher income levels, but income may also provide opportunities that stimulate value change. In contrast, adolescents’ values are unlikely to be a source of parental income. Our results are more consistent with the view of economic background as a predictor of value importance. Nonetheless, no effect on value change was found during the high-school years. Moreover, our hypothesis that parental SES can predict the development of Self-direction-Thought in adolescence was not supported by the data. It is possible, however, that this effect might manifest itself at an earlier development period.

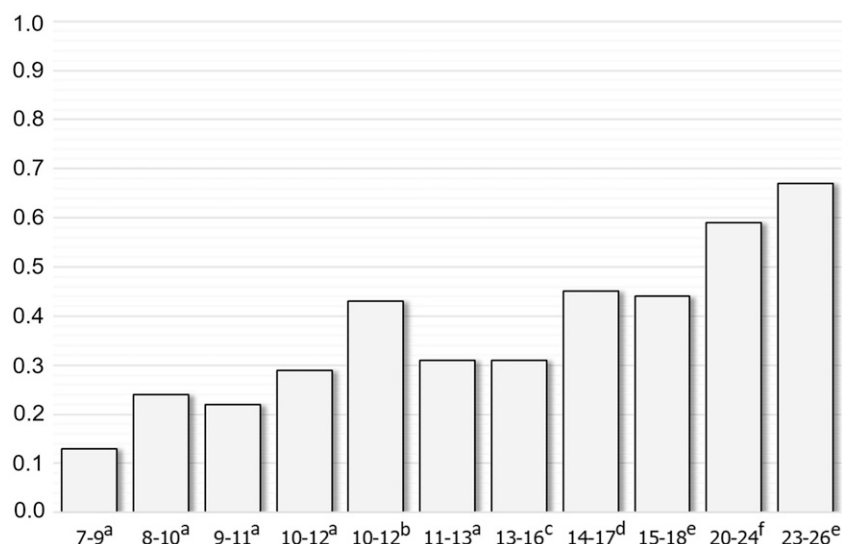
### *The rank-order consistency of the 19 refined values*

We observed a moderate-to-high degree of rank-order consistency over the three years of the study. This indicates that most adolescents tended to maintain their relative position in the sample with respect to the importance they assign to the 19 values of Schwartz’s refined theory. As expected, the stability coefficients showed a slight tendency to increase through the waves of the study (from .53 to .65 on average). A similar pattern was noted in other studies (e.g., Cieciuch et al., 2016; Daniel & Benish-Weisman, 2019). We asked: is there really a consistent trend that leads rank-order stability to increase with age? To provide an overview of results from existing research, we have reported rank-order coefficients found at different ages across all available longitudinal studies using Schwartz’s model (Figure 7).

As values were measured at different levels of specificity, coefficients were averaged over the whole set of values considered in each study (4, 10, or 19). We did not consider time intervals shorter than one year for ease of presentation. As it appears from the plot, rank-order stability tends to increase progressively with age. Notably, Spearman’s rho correlation between participants’ age and average stability coefficients was .95 ( $p < .001$ ). This appears to parallel findings in the domain of traits, suggesting that interindividual differences in values become more stable from childhood to early adulthood. Of course, this is only a tentative picture. Available results are still few and not directly comparable (e.g., data were collected at different time intervals using either raw or centered scores). More studies are needed to enhance our understanding of how rank-order stability varies with age.

### *The stability of the value hierarchy*

A further aim of the study was to investigate the stability of the value hierarchy. When examined between adjacent occasions (one year apart), overall profile stability coefficients ranged in average from .71 to .80. When examined over the entire study period (three years), the average coefficient was .66. Thus, high levels of stability in the hierarchical order of values were found during middle to late adolescence. However, the same pattern did not apply to all participants. We observed appreciable interindividual differences in stability patterns, with a small group of adolescents showing a marked discontinuity in the value hierarchy. Moreover, when corrected for normativeness, profile stability decreased to some extent (the average



**Figure 7.** Rank-order stability coefficients observed across different ages in longitudinal studies on values. Note. <sup>a</sup>Cieciuch et al. (2016); <sup>b</sup>Vecchione et al. (2020); <sup>c</sup>Daniel & Benish-Weisman (2019); <sup>d</sup>Bacchini et al., 2023; <sup>e</sup>present study; <sup>f</sup>Vecchione et al. (2016); <sup>g</sup>Myrsky et al. (2013). All coefficients are uncorrected for measurement error. Age on the x-axis represents the midpoint of the study period (e.g., 11 years for Vecchione et al.'s, 2020, study).

stability coefficient from T1 to T4 was .45). This suggests that part of the consistency observed in the value hierarchies is due to a normative component.

Whereas this is the first study to address distinctive stability in the values hierarchy, two earlier studies (Vecchione et al., 2016, 2020) have reported the overall (raw) stability coefficients. How do the results compare to the present study? The overall stability coefficients observed in our sample were, on average, identical ( $M = .66$ ) to those found from age 10 to 12 in a sample of early adolescents (Vecchione et al., 2020). However, the time interval in that study (2 years) was shorter than in the present one. Our results also align with those found in a sample of adults (Vecchione et al., 2016), which exhibited average coefficients of .59 (20–24 years) and .65 (24–28 years). Yet, the adult study spans the largest time interval (4 years). Since stability tends to decrease as intervals between assessments increase, the observed pattern seems consistent with a trend of increased stability. In sum, based on the little evidence available, the value hierarchies appear to reach high levels of stability already in early adolescence. They are likely to become more robust and consistent at later stages, presumably to the extent that the youth consolidate their sense of self and identity. When referred to personality traits, this has been denoted as an indicator of personality maturation (Klimstra et al., 2009). Additional studies, however, are needed before drawing definitive conclusions.

### Limitations, future directions, and conclusions

What are the shortcomings of this study, and how can they limit its outcomes? A first limitation is the use of a convenience sample, which does not allow us to generalize findings to the general population of Italian high-school students. The study also uses self-report measures, which have inherent limitations. This might be especially true for the assessment of SES, due to potential difficulties for adolescents in accurately

reporting family income or parents' education levels. Moreover, low reliability was found for Security-Personal, Humility, and Achievement. Caution is warranted when interpreting the results for these values, which have shown to be the most problematic in terms of internal consistency (Schwartz & Cieciuch, 2022). A further potential threat to the generalizability of the results was sample attrition. We found that, compared to those who completed the study, students who dropped out tended to assign less importance to Benevolence and Universalism, and more importance to Tradition. This might suggest that, at least in part, attrition was selective with respect to participants' values. As a result, the amount of change observed in these values might have been somewhat biased. Finally, the study is restricted to a relatively limited period of the life course, namely, the high-school years. Further research is needed to include developmental periods that are still unexplored, such as those involving midlife and older age. Despite these limitations, the present study allows us to take a step forward in understanding how basic personal values change throughout life.

In conclusion, our findings suggest that values are quite stable in mid-late adolescence (ages 15–18), and the personal hierarchy of values at this age is as stable as that found in adults. However, meaningful change also occurs. Some values shift to become more similar to adults' values, as seen in the decreasing importance of Hedonism and Stimulation. Others stay more similar to those of earlier adolescents, as in the decrease of Benevolence and increase of Power. As the first study to include Face, we observed a decrease in the importance of how one appears to others during late adolescence. Although we found general trends of value changes, they may vary considerably among individuals. While gender and SES had mostly the expected effects on mean levels of values, they did not affect patterns of change. Together, our findings help draw a roadmap for

the value development of late adolescence toward early adulthood.

### Declaration of conflicting interests

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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### Open science statement



The data that support the findings of this study and scripts that allow reproducing the reported results are openly available in Figshare at <https://figshare.com/s/e829e21baadc3c50732b>.

### Ethical statement

#### Ethics approval

This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the ethical committee of the Department of Psychology, Sapienza University of Rome.

#### Consent to participate

Informed consent was obtained from all participants (or their parents or guardians in the case of participants under 18).

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### Supplemental Material

Supplemental material for this article is available online.

### Notes

1. As an example, Vecchione et al. (2020) have shown that, among the 10 Schwartz's values, Hedonism exhibited the lowest rank-order stability in a sample of early adolescents, probably as a result of substantial interindividual differences in the age at which pubertal changes occur and in the strength of its effects.
2. The component loadings were in the range of .67–.80. Eigenvalues were 2.75, .80, .67, .48, and .31.
3. Based on Chen's (2007) and Kang et al.'s (2016) criteria, changes larger than .010 in CFI, .015 in RMSEA, and .010 in the MNCI have been considered indicative of non-invariance.
4. The ratio of cases to free parameters in the tested models ranged from 10.1 to 18.6. Although there are no absolute standards, this has been deemed a realistic and adequate sample size (e.g., Kline, 2015).
5. This might reflect, for example, individual tendencies to consider some values as more desirable than others.
6. Correlation coefficients were transformed with the Fisher z-transformation before performing the analysis.

### References

- Asparouhov, T., & Muthén, B. O. (2006). Robust chi-square difference testing with mean and variance adjusted test statistics (Mplus Web Notes No. 10). <https://www.statmodel.com/download/webnotes/webnote10.pdf>
- Atherton, O. E., Donnellan, M. B., & Robins, R. W. (2020). Development of personality across the life span. In P. J. Corr & G. Matthews (Eds.), *The Cambridge handbook of personality psychology* (2nd ed., pp. 169–182). Cambridge University Press.
- Bacchini, D., Affuso, G., Aquilar, S., Dragone, M., & Esposito, C. (2023). Values across adolescence: A four-year longitudinal study. The predictive role of community violence and parental acceptance-rejection. *European Journal of Personality*, 37(6), 686–704. <https://doi.org/10.1177/08902070231167199>
- Baker, E. H. (2014). Socioeconomic status, definition. In W. C. Cockerham, R. Dingwall, & S. R. Quah (Eds.), *The wiley blackwell encyclopedia of health, illness, behavior, and society* (pp. 2210–2214). Wiley-Blackwell.
- Baltes, P. (1987). Theoretical propositions of life-span developmental psychology: On the dynamics between growth and decline. *Developmental Psychology*, 23(5), 611–626. <https://doi.org/10.1037/0012-1649.23.5.611>
- Baumert, A., Schmitt, M., Perugini, M., Johnson, W., Blum, G., Borkenau, P., Costantini, G., Denissen, J. J. A., Fleeson, W., Grafton, B., Jayawickreme, E., Kurzius, E., MacLeod, C., Miller, L. C., Read, S. J., Roberts, B., Robinson, M. D., Wood, D., & Wrzus, C. (2017). Integrating personality structure, personality process, and personality development. *European Journal of Personality*, 31(5), 503–528. <https://doi.org/10.1002/per.2115>
- Benish-Weisman, M. (2024). “Tell me who your friends are, and I will tell you who you are”: The contribution of peers to adolescents' values. *Child Development Perspectives*, 18(4), 182–189. <https://doi.org/10.1111/cdep.12510>
- Benjamini, Y., & Hochberg, Y. (1995). Controlling the false discovery rate: A practical and powerful approach to multiple testing. *Journal of the Royal Statistical Society - Series B: Statistical Methodology*, 57(1), 289–300. <https://doi.org/10.1111/j.2517-6161.1995.tb02031.x>
- Berra, M., & Cavaletto, G. M. (2020). Overcoming the stem gender gap: From school to work. *Italian Journal of Sociology of Education*, 12(2), 1–21. <https://doi.org/10.14658/pupijse-2020-2-1>
- Bilsky, W., Janik, M., & Schwartz, S. H. (2011). The structural organization of human values: Evidence from three rounds of the European Social Survey (ESS). *Journal of Cross-Cultural Psychology*, 42(5), 759–776. <https://doi.org/10.1177/0022022110362757>
- Bleidorn, W., Schwaba, T., Zheng, A., Hopwood, C. J., Sosa, S. S., Roberts, B. W., & Briley, D. A. (2022). Personality stability and change: A meta-analysis of longitudinal studies. *Psychological Bulletin*, 148(7–8), 588–619. <https://doi.org/10.1037/bul0000365>
- Borg, I., & Groenen, P. J. F. (2005). *Modern multidimensional scaling* (2nd ed.). Springer.
- Chan, D. (1998). The conceptualization and analysis of change over time: An integrative approach incorporating longitudinal mean and covariance structures analysis (LMACS) and

- multiple indicator latent growth modeling (MLGM). *Organizational Research Methods*, 1(4), 421–483. <https://doi.org/10.1177/109442819814004>
- Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, 14(3), 464–504. <https://doi.org/10.1080/10705510701301834>
- Ciecuch, J., Davidov, E., & Algesheimer, R. (2016). The stability and change of value structure and priorities in childhood: A longitudinal study. *Social Development*, 25(3), 503–527. <https://doi.org/10.1111/sode.12147>
- Conger, R. D., Conger, K. J., & Martin, M. J. (2010). Socioeconomic status, family processes, and individual development. *Journal of Marriage and Family*, 72(3), 685–704. <https://doi.org/10.1111/j.1741-3737.2010.00725.x>
- Conger, R. D., & Dogan, S. J. (2007). Social class and socialization in families. In J. E. Grusec & P. D. Hastings (Eds.), *Handbook of socialization: Theory and research* (pp. 433–460). The Guilford Press.
- Conger, R. D., & Donnellan, M. B. (2007). An interactionist perspective on the socioeconomic context of human development. *Annual Review of Psychology*, 58(1), 175–199. <https://doi.org/10.1146/annurev.psych.58.110405.085551>
- Crone, E. A., & Fuligni, A. J. (2020). Self and others in adolescence. *Annual Review of Psychology*, 71(1), 447–469. <https://doi.org/10.1146/annurev-psych-010419-050937>
- Daniel, E., & Benish-Weisman, M. (2019). Value development during adolescence: Dimensions of change and stability. *Journal of Personality*, 87(3), 620–632. <https://doi.org/10.1111/jopy.12420>
- Daniel, E., Fortuna, K., Thrun, S. K., Cioban, S., & Knafo, A. (2013). Early adolescents' value development at war time. *Journal of Adolescence*, 36(4), 651–654. <https://doi.org/10.1016/j.adolescence.2013.03.009>
- Daniel, E., Misgav, K., & Chomsky, A. (2023). Middle childhood development in personal values. *Journal of Personality*, 92(5), 1283–1298. <https://doi.org/10.1111/jopy.12888>
- Denissen, J. J. A., van Aken, M. A. G., Penke, L., & Wood, D. (2013). Self-regulation underlies temperament and personality: An integrative developmental framework. *Child Development Perspectives*, 7(4), 255–260. <https://doi.org/10.1111/cdep.12050>
- Dobewall, H., & Aavik, T. (2016). Rank-order consistency and profile stability of self- and informant-reports of personal values in comparison to personality traits. *Journal of Individual Differences*, 37(1), 40–48. <https://doi.org/10.1027/1614-0001/a000186>
- Elkind, D. (1967). Egocentrism in adolescence. *Child Development*, 38(4), 1025–1034. <https://doi.org/10.2307/1127100>
- Elkind, D., & Bowen, R. (1979). Imaginary audience behavior in children and adolescents. *Developmental Psychology*, 15(1), 38–44. <https://doi.org/10.1037/0012-1649.15.1.38>
- Enright, R. D., Shukla, D. G., & Lapsley, D. K. (1980). Adolescent egocentrism–sociocentrism and self-consciousness. *Journal of Youth and Adolescence*, 9(2), 101–116. <https://doi.org/10.1007/BF02087929>
- Ferrer, E., Balluerka, N., & Widaman, K. F. (2008). Factorial invariance and the specification of second-order latent growth models. *Methodology: European Journal of Research Methods for the Behavioral & Social Sciences*, 4(1), 22–36. <https://doi.org/10.1027/1614-2241.4.1.22>
- Frankenberger, K. D. (2000). Adolescent egocentrism: A comparison among adolescents and adults. *Journal of Adolescence*, 23(3), 343–354. <https://doi.org/10.1006/jado.2000.0319>
- Furr, R. M. (2008). A framework for profile similarity: Integrating similarity, normativeness, and distinctiveness. *Journal of Personality*, 76(5), 1267–1316. <https://doi.org/10.1111/j.1467-6494.2008.00521.x>
- Gotlieb, R. J. M., Yang, X. F., & Immordino-Yang, M. H. (2024). Diverse adolescents' transcendent thinking predicts young adult psychosocial outcomes via brain network development. *Scientific Reports*, 14(1), 6254. <https://doi.org/10.1038/s41598-024-56800-0>
- Hawley, P. H., Little, T. D., & Card, N. A. (2007). The allure of a mean friend: Relationship quality and processes of aggressive adolescents with prosocial skills. *International Journal of Behavioral Development*, 31(2), 170–180. <https://doi.org/10.1177/0165025407074630>
- ISTAT. (2016). Living conditions and family income. [https://www.istat.it/it/files/2016/12/EN\\_Income-and-living-conditions.pdf](https://www.istat.it/it/files/2016/12/EN_Income-and-living-conditions.pdf)
- Jonkmann, K., Trautwein, U., & Lüdtke, O. (2009). Social dominance in adolescence: The moderating role of the classroom context and behavioral heterogeneity. *Child Development*, 80(2), 338–355. <https://doi.org/10.1111/j.1467-8624.2009.01264.x>
- Kang, Y., McNeish, D. M., & Hancock, G. R. (2016). The role of measurement quality on practical guidelines for assessing measurement and structural invariance. *Educational and Psychological Measurement*, 76(4), 533–561. <https://doi.org/10.1177/0013164415603764>
- Keijer, M. G. (2021). Effects of social economic status and parenting values on adolescents' expected field of study. *Humanities and Social Sciences Communications*, 8(1), 303. <https://doi.org/10.1057/s41599-021-00992-7>
- Klimstra, T. A., Hale, W. W., Raaijmakers, Q. A., Branje, S. J., & Meeus, W. H. (2009). Maturation of personality in adolescence. *Journal of Personality and Social Psychology*, 96(4), 898–912. <https://doi.org/10.1037/a0014746>
- Kline, R. B. (2015). *Principles and practice of structural equation modeling* (4th ed.). Guilford Press.
- Koski, J. E., Xie, H., & Olson, I. R. (2015). Understanding social hierarchies: The neural and psychological foundations of status perception. *Social Neuroscience*, 10(5), 527–550. <https://doi.org/10.1080/17470919.2015.1013223>
- Lampert, M. (2021). Glocalities report: Trust in the united nations. <https://glocalities.com/reports/environmental-trends-2021>
- Manstead, A. S. R. (2018). The psychology of social class: How socioeconomic status impacts thought, feelings, and behaviour. *British Journal of Social Psychology*, 57(2), 267–291. <https://doi.org/10.1111/bjso.12251>
- Marks, P. L., Cillessen, A. N., & Crick, N. R. (2012). Popularity contagion among adolescents. *Social Development*, 21(3), 501–521. <https://doi.org/10.1111/j.1467-9507.2011.00647.x>
- McArdle, J. J. (1988). Dynamic but structural modeling of repeated measures data. In J. R. Nesselroade & R. B. Cattell (Eds.), *The handbook of multivariate psychology* (2nd ed., pp. 561–614). Springer.
- Milfont, T. L., Milojev, P., & Sibley, C. G. (2016). Values stability and change in adulthood: A 3-year longitudinal study of rank-order stability and mean-level differences. *Personality and*



- Social Psychology Bulletin*, 42(5), 572–588. <https://doi.org/10.1177/0146167216639245>
- Muthén, L. K., & Muthén, B. O. (2017). *Mplus user's guide* (8th ed.). Muthén & Muthén.
- Myrsky, L., Juujarvi, S., & Pessa, K. (2013). Change in values and moral reasoning during higher education. *European Journal of Developmental Psychology*, 10(2), 269–284. <https://doi.org/10.1080/17405629.2012.757217>
- Poortinga, W., Demski, C., & Steentjes, K. (2023). Generational differences in climate-related beliefs, risk perceptions and emotions in the UK. *Communications Earth & Environment*, 4(1), 229. <https://doi.org/10.1038/s43247-023-00870-x>
- Raftery, A. E. (1995). Bayesian model selection in social research. In A. E. Raftery (Ed.), *Sociological methodology* (pp. 111–164). Blackwell.
- Roberts, B. W. (2006). Personality development and organizational behavior. In B. M. Staw (Ed.), *Research on organizational behavior* (pp. 1–41). Elsevier Science/JAI Press.
- Roberts, B. W., & Davis, J. P. (2016). Young adulthood is the crucible of personality development. *Emerging Adulthood*, 4(5), 318–326. <https://doi.org/10.1177/2167696816653052>
- Roberts, B. W., & DelVecchio, W. F. (2000). The rank-order consistency of personality traits from childhood to old age: A quantitative review of longitudinal studies. *Psychological Bulletin*, 126(1), 3–25. <https://doi.org/10.1037/0033-2909.126.1.3>
- Roberts, B. W., & Nickel, L. B. (2021). Personality development across the life course: A neo-socioanalytic perspective. In O. P. John & R. W. Robins (Eds.), *Handbook of personality: Theory and research* (4 ed., pp. 259–283). The Guilford Press.
- Roberts, B. W., Walton, K. E., & Viechtbauer, W. (2006). Patterns of mean-level change in personality traits across the life course: A meta-analysis of longitudinal studies. *Psychological Bulletin*, 132(1), 1–25. <https://doi.org/10.1037/0033-2909.132.1.1>
- Roberts, B. W., Wood, D., & Caspi, A. (2008). The development of personality traits in adulthood. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (pp. 375–398). The Guilford Press.
- Roberts, B. W., Wood, D., & Smith, J. L. (2005). Evaluating five factor theory and social investment perspectives on personality trait development. *Journal of Research in Personality*, 39(1), 166–184. <https://doi.org/10.1016/j.jrp.2004.08.002>
- Roccas, S., Sagiv, L., & Navon, M. (2017). Methodological issues in studying personal values. In S. Roccas & L. Sagiv (Eds.), *Values and behavior: Taking a cross-cultural perspective* (pp. 15–50). Springer International Publishing. [https://doi.org/10.1007/978-3-319-56352-7\\_2](https://doi.org/10.1007/978-3-319-56352-7_2)
- Sagiv, L., & Schwartz, S. H. (2022). Personal values across cultures. *Annual Review of Psychology*, 73, 517–546. <https://doi.org/10.1146/annurev-psych-020821-125100>
- Schwartz, S. H. (1992). Universals in the content and structure of values: Theoretical advances and empirical tests in 20 countries. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (pp. 1–65). Academic Press.
- Schwartz, S. H. (2005). Robustness and fruitfulness of a theory of universals in individual human values. In A. Tamayo & J. B. Porto (Eds.), *Values and behavior in organizations* (pp. 56–95). Vozes.
- Schwartz, S. H. (2006). Les valeurs de base de la personne: Théorie, mesures et applications. *Revue Française de Sociologie*, 42, 249–288. <https://doi.org/10.3917/rfs.474.0929>
- Schwartz, S. H. (2012). An overview of the Schwartz theory of basic values. *Online Readings in Psychology and Culture*, 2(1), 1–20. <https://doi.org/10.9707/2307-0919.1116>
- Schwartz, S. H. (2016). Coding and analyzing PVQ-RR data (instructions for the revised Portrait Values Questionnaire). Unpublished. <https://doi.org/10.13140/RG.2.2.35393.56165>
- Schwartz, S. H. (2017). The refined theory of basic values. In S. Roccas & L. Sagiv (Eds.), *Values and behavior: Taking a cross-cultural perspective* (pp. 51–72). Springer International Publishing.
- Schwartz, S. H., & Bardi, A. (2001). Value hierarchies across cultures: Taking a similarities perspective. *Journal of Cross-Cultural Psychology*, 32(3), 268–290. <https://doi.org/10.1177/0022022101032003002>
- Schwartz, S. H., & Cieciuch, J. (2022). Measuring the refined theory of individual values in 49 cultural groups: Psychometrics of the revised Portrait Value Questionnaire. *Assessment*, 29(5), 1005–1019. <https://doi.org/10.1177/1073191121998760>
- Schwartz, S. H., Cieciuch, J., Vecchione, M., Davidov, E., Fischer, R., Beierlein, C., Ramos, A., Verkasalo, M., Lönnqvist, J. E., Demirutku, K., Dirilen-Gumus, O., & Konty, M. (2012). Refining the theory of basic individual values. *Journal of Personality and Social Psychology*, 103(4), 663–688. <https://doi.org/10.1037/a0029393>
- Schwartz, S. H., & Rubel, T. (2005). Sex differences in value priorities: Cross-cultural and multimethod studies. *Journal of Personality and Social Psychology*, 89(6), 1010–1028. <https://doi.org/10.1037/0022-3514.89.6.1010>
- Sebastian, C., Burnett, S., & Blakemore, S. J. (2008). Development of the self-concept during adolescence. *Trends in Cognitive Sciences*, 12(11), 441–446. <https://doi.org/10.1016/j.tics.2008.07.008>
- Seifert, I. S., Rohrer, J. M., Egloff, B., & Schmukle, S. C. (2022). The development of the rank-order stability of the Big Five across the lifespan. *Journal of Personality and Social Psychology*, 122(5), 920–941. <https://doi.org/10.1037/pspp0000398>
- Smallenbroek, O., & Stanciu, A. (2024). Age and gender differences in the value development of Dutch adults in 11 years of longitudinal data. *Journal of Research in Personality*, 113, Article 104540. <https://doi.org/10.1016/j.jrp.2024.104540>
- Somerville, L. H., Jones, R. M., & Casey, B. J. (2010). A time of change: Behavioral and neural correlates of adolescent sensitivity to appetitive and aversive environmental cues. *Brain and Cognition*, 72(1), 124–133. <https://doi.org/10.1016/j.bandc.2009.07.003>
- Soto, C. J. (2016). The little six personality dimensions from early childhood to early adulthood: Mean-level age and gender differences in parents' reports. *Journal of Personality*, 84(4), 409–422. <https://doi.org/10.1111/jopy.12168>
- Steinberg, L. (2002). *Adolescence* (6th ed.). McGraw-Hill.
- Steinberg, L. (2008). A social neuroscience perspective on adolescent risk-taking. *Developmental Review*, 28(1), 78–106. <https://doi.org/10.1016/j.dr.2007.08.002>

- Tulviste, T., & Tamm, A. (2014). Brief report: Value priorities of early adolescents. *Journal of Adolescence*, 37(5), 525–529. <https://doi.org/10.1016/j.adolescence.2014.04.006>
- Uzefovsky, F., Döring, A. K., & Knafo-Noam, A. (2016). Values in middle childhood: Social and genetic contributions. *Social Development*, 25(3), 482–502. <https://doi.org/10.1111/sode.12155>
- Van den Akker, A. L., Deković, M., Asscher, J., & Prinzie, P. (2014). Mean-level personality development across childhood and adolescence: A temporary defiance of the maturity principle and bidirectional associations with parenting. *Journal of Personality and Social Psychology*, 107(4), 736–750. <https://doi.org/10.1037/a0037248>
- Vecchione, M., & Alessandri, G. (2017). Validation of the Italian version of the portrait values questionnaire-revised (PVQ-R). *Giornale Italiano di Psicologia*, 44(1), 159–178. <https://doi.org/10.1421/86906>
- Vecchione, M., Caprara, G., Schoen, H., Castro, J. L. G., & Schwartz, S. H. (2012). The role of personal values and basic traits in perceptions of the consequences of immigration: A three-nation study. *British Journal of Psychology*, 103(3), 359–377. <https://doi.org/10.1111/j.2044-8295.2011.02079.x>
- Vecchione, M., & Schwartz, S. H. (2022). Personal values and academic achievement. *British Journal of Psychology*, 113(3), 630–652. <https://doi.org/10.1111/bjop.12555>
- Vecchione, M., Schwartz, S. H., Alessandri, G., Döring, A. K., Castellani, V., & Caprara, M. G. (2016). Stability and change of basic personal values in early adulthood: An 8-year longitudinal study. *Journal of Research in Personality*, 63, 111–122. <https://doi.org/10.1016/j.jrp.2016.06.002>
- Vecchione, M., Schwartz, S. H., Davidov, E., Cieciuch, J., Alessandri, G., & Marsicano, G. (2020). Stability and change of basic personal values in early adolescence: A 2-year longitudinal study. *Journal of Personality*, 88(3), 447–463. <https://doi.org/10.1111/jopy.12502>
- Veenstra, R., & Laninga-Wijnen, L. (2023). The prominence of peer interactions, relationships, and networks in adolescence and early adulthood. In L. J. Crockett, G. Carlo, & J. E. Schulenberg (Eds.), *APA handbook of adolescent and young adult development* (pp. 225–241). American Psychological Association. <https://doi.org/10.1037/0000298-014>