

CONSCIENTIOUSNESS IN CHILDHOOD

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Guided by the broad meaning of the Big Five factor Conscientiousness, a search is made for analogous constructs in the research of temperament and personality in infancy and childhood. Examples are presented from factor analytic studies of personality ratings by parents and by teachers (using both questionnaires and Q-sort techniques) and from expert codings of free personality descriptions by parents and by children. The data presented suggest that from school age onwards a factor quite similar to adult Conscientiousness is clearly binding a portion of the variance in parent and teacher ratings. In free descriptions, between seven and ten percent of the personality relevant descriptors of children of school age are usually coded in a category analogous to adult Conscientiousness.

INTRODUCTION

Where and when to locate the beginning of psychological interest in the cluster of meanings associated with the Big Five factor Conscientiousness? Without pretending to be exhaustive we may point at the phrenologists of the 19th century, who drew pictures of the brain with separate locations for, a.o., „cautiousness“, „approbateness“, „acquisitiveness“, „constructiveness“, „firmness“ and „conscientiousness“.

For the next relic from prescientific times we refer to Freud's conception of the anal character (Freud, 1908, 1977). To quote from the English translation by Strachey:

The people I am about to describe are noteworthy for a regular combination of the three following characteristics. They are especially *orderly*, *parsimonious* and *obstinate*.

Each of these words actually covers a small group or series of interrelated character-traits. „Orderly“ covers the notion of bodily cleanliness, as well as of conscientiousness in carrying out small duties, and trustworthiness. Its opposite would be „untidy“ and „neglectful“. (Freud, 1977, p. 209)

The editor of the 1977 Pelican edition, Angela Richards, added a footnote to explain her choice for the word *orderly* to translate Freud's original „ordentlich“:

The original meaning of the word (ordentlich) is „orderly“; but it has become greatly extended in use. It can be the equivalent of such

English terms as „correct”, „tidy”, „cleanly”, „trustworthy”, as well as „regular”, „decent”, and „proper”, in the more colloquial senses of those words. (Freud, 1977, p. 209, footnote)

Freud asserted that parsimony and obstinacy are linked with each other more closely than they are with orderliness, and that the first two are, also, the more constant element of the character complex: „Yet it seems to me incontestable that all three in some way belong together” (Freud, 1977, p. 210). Freud saw the first expression of this character in early childhood of such persons when „they took a comparatively long time to overcome their infantile faecal incontinence”. (....) „As infants, they seem to have belonged to the class who refuse to empty their bowels when they are put on the pot, because they derive a subsidiary pleasure from defaecating.” (....) „From these indications we infer that such people are born with a sexual constitution in which the erotogenicity of the anal zone is exceptionally strong”. Freud thus saw „conscientiousness” (so translated from his original „Gewissenhaftigkeit”) as part of a constitutional given type of personality.

The history of Conscientiousness as one of the Big Five has been well documented (e.g., John, Angleitner and Ostendorf, 1988; John, 1990) and need not be repeated extensively. Cattell (1945) reduced the 4,500 traits from Allport and Odbert’s list of traits to 35 variables. His hand-rotated factor analysis produced a second factor reflecting primarily intellectual characteristics but also Will and Conscientiousness: It includes „intellectual/analytical”, „strong-willed/conscientious”, „intellectual/wide interests”, and „wise/mature/polished” as contrasted with „changeable/unreflective” and „changeable/unrealistic” (John, 1990, p. 70).

The next steps were taken by Fiske (1949) and Tupes and Christal (1961; 1992) working with simplified descriptions of Cattell’s variables, more and larger samples of subjects and better calculators. Tupes and Christal found „five relatively strong and recurrent factors and nothing more of any consequence” (1961, p. 14). They labeled their third factor Dependability, including the scales conscientious, responsible and orderly. It took twenty years more before Digman and Takemoto-Chock (1981) could demonstrate the existence of the FFM in teacher ratings of first- and second-grade schoolchildren on the Cattell-Coan Scales. These authors proposed the label *Will to Achieve* as more appropriate than *Conscientiousness*, after Webb (1915), who suggested that Will (w) was a factor to be distinguished from general Intelligence (g) in predicting achievement.

Present-day Meanings of the Factor Labeled Conscientiousness

Goldberg. Goldberg (1992) developed a set of 100 unipolar markers, 20 marking each of the Big-Five factors. These 100 markers have proved to be univocal factor definers in a variety of samples of self and peer descriptions. In the literature they are now known as the Goldberg-markers. In Table 1 the markers for factor III are presented, based on self-ratings of 503 American college students.

Table 1. *Goldberg Unipolar Markers for Factor III, Conscientiousness and Varimax-Rotated Factor Loadings*

III+		III-	
Organized	.77	Disorganized	-.76
Neat	.67	Careless	-.61
Systematic	.63	Unsystematic	-.60
Efficient	.62	Inefficient	-.60
Thorough	.58	Sloppy	-.57
Practical	.54	Haphazard	-.53
Prompt	.50	Inconsistent	-.50
Careful	.47	Impractical	-.49
Steady	.44	Negligent	-.49
Conscientious	.30	Undependable	-.45

Note. From Goldberg & Rosolack, 1994, Appendix C.

McCrae and Costa. Costa and McCrae published their revised NEO Personality Inventory to assess the Big Five (NEO-PI-R, Costa & McCrae, 1992). In a college-age normative sample of 148 male and 241 female students a factor identified as Conscientiousness bound the variance of six facet scales with loadings over .60: Achievement Striving (.83), Self-discipline (.81), Competence (.75), Dutifulness (.71), Deliberation (.70), and Order (.64).¹ The prominence of the facet Achievement Striving, also expressed in Digman's preference for the label *Will*, is not so strongly represented in Goldberg's marker variables. E.g., the highest loading facet in the NEO-PI-R, Achievement Striving, is not explicitly recognizable in Goldberg's marker variables. On the other hand, the highest loading markers in the Goldberg solution, indicating being organized and neat, are

¹ Between parentheses the factor loadings in a study of 389 American college students, aged 17-20.

only explicitly represented in the lowest loading facet scale of the NEO-PI-R factor solution reported above. The fact that there is no overlap in words between both lists has partly to do with the fact that Goldberg uses adjectives for his markers whereas Costa and McCrae use nouns for the names of their facet scales. Nevertheless, the impression of two slightly different orientations remains. Goldberg's factor III seems to be more restricted in meaning (to order) than the corresponding factor in the work of Costa and McCrae (see also McCrae & Costa, 1990, p.42-45) that seems to put higher value on the striving for achievement than on the degree of orderliness with which such is done.

Ostendorf and Angleitner. Another illustration from the rapidly growing research literature comes from the German work by Ostendorf and Angleitner. Table 2 stems from one of the publications based on the

Table 2. *Variables with Highest Loadings on Factor III (Conscientiousness)*

	German original	English translation	PR	SR
1	arbeitsam	hard-working	.72	.68
2	fleissig	industrious	.71	.68
3	pflichtbewusst	conscientious	.74	.64
4	emsig	diligent	.64	.64
5	strebsam	ambitious	.66	.64
6	pflichtteifrig	conscientious	.72	.62
7	pflichttreu	dutiful	.67	.60
8	zielbewusst	goal directed	.57	.59
9	ordentlich	organized	.67	.57
10	tüchtig	efficient	.67	.57
11	konsequent	consequent	.44	.56
12	verantwortungsbewusst	responsible	.60	.53
13	zielstrebig	determined	.54	.52
14	selbstdiszipliniert	self-disciplined	.53	.51
15	ordnungsliebend	tidy-minded	.63	.51
16	zielsicher	purposeful	.56	.51
17	verlässlich	reliable	.46	.49
18	tolpatschig	awkward	-.51	-.47
19	unbeständig	unsteady	-.49	-.55
20	arbeitsscheu	workshy	-.63	-.58

Note: From German study by Ostendorf and Angleitner (1992). Factor loadings from five varimax rotated principal components in samples of peer- and self-ratings. Some of the translations changed by the present authors.

PR = averaged peer-ratings (three per subject): N=511; SR = self-ratings: N=511.

The scales are ranked according to their factor loadings in the self-ratings.

dissertation study by Ostendorf (Ostendorf and Angleitner, 1992; original data in Ostendorf, 1990).

Some of the highest loading adjectives in this large scale German study, *arbeitsam* (hard-working), *fleissig* (industrious), *emsig* (diligent), *strebsam* (ambitious), *arbeitsscheu* (workshy), are not explicitly represented among the Goldberg markers of this factor (Table 1) and seem to define the German factor Conscientiousness more in accordance with the conception of McCrae and Costa. This impression is confirmed by another study in which 300 German adults were asked to fill out the German versions of several questionnaires, among which the Personality Research Form and the NEO Personality Inventory by Costa and McCrae. From their results the authors concluded that Digman's *Will to achieve* was a better label for their third factor than *Conscientiousness* (Ostendorf & Angleitner, 1992). Such discordances may be the result of slightly different rotations of axes in the factor analyses by the individual authors, but it may also be that in the selection of scales for their instruments the authors have followed slightly different strategies.

Conscientiousness in Childhood

It should not be too difficult to *speculate* what traits of children and adolescents resemble, and thus may antecede, the different facets of adult Conscientiousness as described above. Depending on what facet of adult Conscientiousness one concentrates on, one can easily find analogies in child and adolescent behavior. Going beyond speculation one may review the factor analytic studies of child and adolescent temperament and personality, to see whether factors have emerged that clearly are analogous to one or more key facets of adult Conscientiousness. The truth of such a supposed analogy can only be proven in *longitudinal* studies. Having assessed conscientiousness-related traits in children one could follow such children into adulthood to see if the rank orders on the supposed conscientiousness traits remain more or less the same with increasing age.

Since such studies have not yet been done, we have to rely on speculation and on the agreement between specialists on plausible analogies. Successively we will focus on two different phases of youth: infancy and childhood, the latter including early adolescence. For each phase we ask: what traits seem to be plausible antecedents of the FFM factor

Conscientiousness? Again, we do not pretend to be exhaustive in discussing the studies selected for this short review.

INFANCY

Rothbart's Focus on Effortful Control

Rothbart and Posner (1985) have proposed temperamental individual differences among infants of *Effortful Control*, reflecting individual differences in *attentional self-regulation*.

Operationally, Effortful Control is reflected in individual differences in the ability to voluntarily sustain focus on a task, to voluntarily shift attention from one task to another, to voluntarily initiate action, and to voluntarily inhibit action. Although the maturation of this system undergoes rapid growth during the last half of the infant's first year, this system appears to continue to mature throughout at least the preschool years. (Ahadi & Rothbart, 1994)

Rothbart and associates see Effortful Control as a superordinate system of self-regulation, modulating the behavioral tendencies of approach-withdrawal, expressions of anxiety (and of anger, distress), and attentional processes. In their theorizing it seems as if all „decisions“ to let go or stop an activity are dependent on the wellfunctioning of this self-regulatory system.

Discussing the possible relation between Effortful Control and the adult personality trait of Conscientiousness, Ahadi and Rothbart (1994) suggest that the self-regulative aspects of the factor Conscientiousness may be developmentally rooted in early expressions of individual differences in Effortful Control. Such a hypothesis, supported by an authoritative psychobiological theory, awaits to be tested in longitudinal studies. Do infants who can keep their attention focussed longer indeed grow up to be the more conscientious pupils first, and the more conscientious workers later?

In our opinion, the low stability coefficients usually obtained in longitudinal studies of temperament beginning in infancy, give little hope of finding much infancy-adulthood continuity in future studies, but more refined operationalizations may disclose links that were thus far hidden. Even so, important facets of FFM Conscientiousness such as being industrious, ambitious and hardworking (next to organized and orderly) are not easily recognizable in Rothbart's theory of the early expressions of the

self-regulative system. Also, when Ahadi and Rothbart (1994) suggest that „one's ability to control attention facilitates internalization of social values”, and that „inability to control attention may lead to the more disorganized, inconsistent, and nonconformist characterization of individuals low on Conscientiousness” (p. 200) the focus of these authors is on the *controls*, at the regulation and direction of energy, not at the differences in available energy that seem to be behind differences in traits as being hardworking and industrious. This reflects the major problem with the broadness of the factor Conscientiousness, that it combines differences in the *energy available* to the individual, in the *will* to use these energies, *and* in the *controls* to use these energies in efficient and positively valued ways.

Authors Using Questionnaires Based on the Thomas-Chess Nine-Dimensional Model

Martin, Wisenbaker and Huttunen (1994) reviewed 12 studies in which parents or teachers had been rating their children or pupils on questionnaires tapping the nine dimensions of temperament postulated by Thomas and Chess (e.g., 1977). Only those studies were included that had used intercorrelations of individual items, not of the nine scales. Four studies were selected that factor analyzed parental ratings of *infants*. In two of these four studies, both done in Sweden, a factor labeled „attentiveness” was found, and in the third, an Australian one, a very small ninth factor, labeled „persistence,,,,,” was found. No factor resulted from the fourth, Finnish, infant study, that could be seen as analogous.

Martin et al. (1994) see the Swedish infant attentiveness factor as related with the task persistence factors found in parent and teacher ratings of children at later ages, but one of the authors of the Swedish studies, Hagekull (1994), sees a stronger possible relation of attentiveness in infancy with later *Emotional Stability* than with Conscientiousness. For Conscientiousness she candidates her infant factor „Manageability” to be a possible antecedent trait of Conscientiousness (Hagekull, 1994) because this factor predicted scores on a factor „impulsivity” in early childhood.

It is clear from this short review that the specialists in infant temperament are creative in seeing links between infant factors and later developing Conscientiousness. Effortful control, attention regulation, attentiveness and being easy or difficult to handle for parents (manageability), are all seen as eventually antecedent later individual differences in Conscientiousness.

Without the proof given by longitudinal studies none of these speculations is to be preferred over another.

EARLY AND LATER CHILDHOOD

Authors Using Questionnaires Based on the Thomas-Chess Nine-Dimensional Model

From the above study by Martin et al. (1994) it became clear that a factor Task Persistence, combined with items tapping Attention span and Distractability are prominent in most if not all factor analytic studies of the questionnaires based on the Thomas-Chess nine-dimensional model. The authors state that this factor becomes clearer in content in ratings of children ranging in age from the preschool period through adolescence, than it is in infancy. And also, that it is the dominant factor in ratings provided by teachers. However, these authors warn us for simplistic interpretations:

The consistency with which this factor is obtained belies the complexity of the behavioral phenomena being rated. In infancy, the core items are related to the ability to notice variation in the environment, based on reaction to this variation. Attention is obviously involved in this process. Some items tap continuity of attention. At the preschool level, items assessing ability to control motoric activity, and to continue a frustrating learning experience, begin to appear. In later childhood and adolescence, the emphasis is on attention span. The most central behavior assessed by these items at all ages is continuity of activities related to learning or productive activity. (p. 166)

In a cross-language study (Kohnstamm, Van der Kamp, Zhang, Martin, Sanson, & Huttunen, submitted), the Thomas/Chess questionnaire items for 5 and 6 year old preschool children, obtained with large samples in Finland, Australia and China (ratings by parents), were compared. A factor similar across studies was found, composed of the items as shown in Table 3.

Table 3. *A Factor Labeled Task Persistence in Translations/Adaptations of the Thomas-Chess Questionnaire: Parents Rating 5-6 Year Old Children*

		Thomas/Chess dimension	Finland 7 factors factor 4	Australia 6 factors factor 2	China 6 factors factor 4
53.	My child can sit quietly through an entire children's movie, baseball game, or a long TV program	activity	.62	.40	.51
64.	My child gets involved in quiet activities such as crafts, watching television, reading or looking at picture books	activity	.60	.59	.56
34.	My child sits still to have a story told or read, or a song sung	activity	.59	.47	.47
5.	When my child starts a project such as a model, puzzle, painting, he/she works at it without stopping until completed, even if it takes a long time	persistence	.55	.79	.58
37.	When learning a new physical activity (such as hopping, skating, bike riding) my child will spend long periods of time practicing	persistence	.37	.39	(.26)

Of the five items three were originally written to measure the Thomas/Chess dimension Activity, and two to measure Persistence. In our opinion, the original Thomas/Chess Persistence dimension is composed of items measuring persistence in negative emotional states as well as persistence in task behavior. Factor analysis procedures at item level (instead of on the scales) show that these two kinds of persistent behavior measure different traits.

A Factor Analytic Study of the Carey Middle Childhood Temperament Questionnaire

McClowry, Hegvik and Teglassi (1993) did a factor analysis at item level of one of the parent temperament questionnaires based on the Thomas/Chess nine-dimensional structure: the MCTQ (8-12 years) (Hegvik, McDevitt, & Carey, 1980). In two samples a total of 868 children were rated by their mothers. Only four reliable factors were found that were labeled as Task Persistence, Negative Reactivity, Approach/Withdrawal and Activity. The first factor binds mainly items that tap the difficulty a child may have in completing assignments (homework, household chores, etc.) or own projects (drawings, models, etc.).

Teacher Ratings of Schoolchildren

The roughly developed picture above can be clarified with results from studies in which teachers rate their pupils. In Martin's studies with the Temperament Assessment Battery for Children (TAB; Martin, 1988), a three factor solution resulted in factors labeled as Emotionality, Persistence and Sociability. Persistence (actually Task Persistence) was a combination of scales measuring being non-distractable (in attention directed at tasks), of not running around and showing other manifestations of gross motor activity (in the classroom), and of being persistent in completing tasks. The combination of those three scales was labeled *Task Orientation* (Martin, Olejnik, & Gaddis, 1994) and proved to be a better predictor of school grades in reading and math than IQ.

A similar factor of Task Orientation in teacher ratings of schoolchildren is found in many other studies. For example, in the Dutch questionnaire SCHOB (Bleichrodt, Resing, & Zaal, 1994) a strong factor Task Orientation (Werkhouding) resulted from factoring items that were collected by interviewing teachers on pupil individual differences in classroom behavior. The authors describe a child scoring high on Task Orientation as a child who can concentrate for a long time on his or her work, who has a regular quality and speed of working, who is dedicated to his work and who works neatly. This in opposition to a child who is distractable, uninterested and careless, irregular in quality and speed of output and who often has to be warned by the teacher.

Another large-scale Dutch study, by Kalverboer and his associates (Kalverboer, Pluister, & Visser, in press), was also based on an exhaustive

inventory of observed classroom behaviors. In this respect, both studies differ from the ones reviewed above (including the TAB), which were exclusively based on the original Thomas-Chess framework and on the selection of behavioral indices. Kalverboer factor-analysed the teacher ratings of 1381 pupils on 30 GGBS scales of three items each. He found a large first factor (explaining 37% of the variance) that he labeled as Task Orientation behavior. Ten scales loaded above .60 on this factor: Conscientious (-.88), distractable (.86), calm (-.80), irregular in quality of output (.77), hyperactive (.76), difficulty with writing (.75), careless (.74), dreamy (.69), obedient (-.67) and talkative (.64). Kohnstamm (1992), using the same instrument, replicated this result in an independent study with 290 pupils between 6 and 9 years old, rated by teachers of 290 different schools, spread all over the country. The two other factors found by both Kalverboer and Kohnstamm were labeled as Extraversion and Social disagreeable behavior.

Mervielde (1994) had students ask teachers to think about the pupils in their current class and to list several characteristics illustrating differences among pupils. The students emphasized that elicited constructs should reflect differences in temperament and personality and be formulated as traits or adjectives. The 768 different constructs elicited from the teacher (in Flemish Dutch) were classified according to the Abridged Big Five Circumplex (AB5C) taxonomy, developed by Hofstee and de Raad (1991) for the Dutch language (see also Hofstee, de Raad, & Goldberg, 1992). Among the 34 most often mentioned constructs were seven that have to do most with being Conscientious or not. Only one of those (Industrious) was a „pure” Conscientiousness marker according to the AB5C taxonomy. Three had their highest loading on Conscientiousness but a considerable second loading on other factors, and three were not among the AB5C adjectives used for constructing the AB5C taxonomy.

In another study, Mervielde, Buyst, and De Fruyt (in press) had teachers rate their pupils on 5 bipolar scales for each of the Big Five selected from the list of Goldberg markers (in Flemish-Dutch translation; Mervielde, 1992). The Conscientiousness markers were (in Dutch translations): inaccurate-accurate, negligent, conscientious, neglectful-thorough, careless-careful and lazy-industrious. Factor-analysis at different age levels revealed that the Conscientiousness markers and the Openness to Experience/Intelligent markers sometimes blend into one common factor. The Openness to Experience/Intelligent bipolar markers were: unintelligent-intelligent; unsensible-sensible; unimaginative-imaginative; uncreative-creative,

uninterested-eager to learn. In the teacher ratings of pupils aged 4-6, and 10-12 most of these markers merged into one factor. However, in the teacher ratings of children aged 6-8 and 8-10, two clearly distinct factors emerged, with only one intended Openness to Experience/Intelligence marker (uninterested-eager to learn) loading higher on the factor Conscientiousness. This mixture - in the perceptions and ratings of the teachers - of the FFM dimensions III and V, was also found when school children rated their peers (Mervielde & de Fruyt, submitted), and will reappear in the next section of this article.

Parents and Teachers Sorting the California Child Q-set

In two studies, done in Pittsburg, USA and Nijmegen, the Netherlands, data obtained with the California Child Q-set (CCQ; J.H. Block & J. Block, 1980) were re-analysed to see how much of the FFM structure was recognizable in factor solutions, just as McCrae, Costa, and Busch (1986) had done for the adult version of this instrument, the California Adult Q-set (CAQ).

John, Caspi, Robins, Moffitt, and Stouthamer-Loeber (1994) reported results of Q-sorts provided by mothers of 350 ethnically diverse boys between 12 and 13 years old, living in a Pittsburgh inner city area (see also Robins, John, & Caspi, 1994). A „common language” version of the CCQ was used, adapted for use by lay persons. John sorted half of the 100 CCQ items into five piles, according to the broad meanings of the five factors in the FFM. He decided on rational (not empirical) grounds that 48 items were sufficiently FFM related to put them in five preliminary scales, supposedly measuring the Big Five. These 48 items have been published in their five rationally composed groupings (John et al., 1994; Robins et al., 1994) and the question is now whether results from factor analytic studies will sufficiently confirm the clustering of the CCQ items involved.

In passing it is noted that 52 items of the CCQ could not be allocated to either of the Big Five on rational or intuitive grounds. In Table 4 the nine CCQ-items that John selected to measure Conscientiousness are presented. The coefficient alpha reliability for this scale was .78.

Table 4. *Items Selected From the California Child Q-set by John (John et al., 1994) to Measure FFM Conscientiousness in Early Adolescence*

CCQ item	factor loadings Pittsburgh	factor loadings Nijmegen
36. He finds ways to make things happen and get things done.	.42	.19
41. He is determined in what he does; he does not give up easily.	.55	.33
47. He has high standards for himself. He needs to do very well in the things he does.	.52	.68
59. He is neat and orderly in the way he dresses and acts.	.23	.26
66. He pays attention well and can concentrate on things.	.61	.70
67. He plans things ahead; he thinks before he does something. He „looks before he leaps“.	.51	.65
76. He can be trusted; he's reliable, and dependable.	.39	.23
89. He's able to do many things well; he is skillful.	.39	.63
99. He thinks about his actions and behaviors; he uses his head before doing or saying something.	.53	.51

Note. Loadings in first column are on a second factor resulting from PCA of inter correlations of 100 CCQ items by John et al. (data obtained from the author).

Loadings in second column are on a third factor in a Dutch study by van Lieshout and Haselager (1994).

Without waiting for an empirically based scale construction (using some form of factor analysis) the authors already demonstrated the validity of Conscientiousness, thus assessed (by mothers sorting all 100 CCQ items into piles) in the young adolescent sample of Pittsburgh boys.

The CCQ Conscientiousness score distinguished significantly between delinquent and non-delinquent boys, between boys with and without externalizing disorders, and, unexpected by the authors, between boys with and without internalizing disorders. Also, this (preliminary) CCQ

Conscientiousness score correlated significantly but low with measures of intelligence and school achievement.

In a subsequent principal components analysis of the Pittsburgh CCQ data, involving all 100 CCQ items, seven interpretable factors emerged (after rotation to the Varimax criterion), the second of which strongly resembled Conscientiousness. Factor scores computed for this factor correlated .76 with the scores computed from the nine preselected items. This means that there is considerable overlap between both constructs, but not identity. In Table 4 the factor loadings obtained by John (personal communication) are shown in the first column.

Apart from five FFM-related factors, John and his associates found a sixth and seventh factor, labeled „Activity” and „Irritability”. We will return to this fact in a moment, when discussing the results of another CCQ study, done in the Netherlands.

There is some irony in the fact that Block, a devoted sceptic regarding the validity of the FFM (Block, in press) must see his Q-sort instrument be analyzed for FFM-content and FFM-structure. From the Netherlands, van Lieshout and Haselager (1994) reported the CCQ-descriptions of children and adolescents from six different studies. The CCQ cards were sorted for a total of 720 subjects, ranging in age from 3 to 16. The studies differed in who sorted the CCQ cards: the parents, teachers, or adolescents (self- and peer ratings).

A Dutch translation of the original CCQ-items was used and not the „common language” version as in the study reviewed above. Factor analysis was performed on the total group and on subgroups. In the total group a third factor was found that was labeled Conscientiousness. It was a relatively small factor when compared with the first two, labeled as Agreeableness and Emotional Stability (Agreeableness was also the first factor in the Pittsburgh data). In Table 4 the Dutch factor loadings for the nine CCQ-items, selected by John, are presented in the second column. These loadings resulted from the analysis done on the total group. Five of the nine John-items loaded over .50 in the Dutch study. One („can be trusted, is dependable”) loaded high (.68) on Agreeableness, and low on Conscientiousness (.23). One very typical Conscientiousness item, „Persistent, does not give up”, loaded no higher than .33 in the Dutch data, and the item „neat and orderly in dress” loaded only .26. In contrast, two typical Intellect/Openness items, preselected by John for his CCQ Openness scale (item 68 „High intellectual capacity” and item 40 „Is curious and exploring”) loaded highest on the Dutch Conscientiousness factor, and not on the fourth

Dutch factor that was too different from Openness to be convincingly interpreted as the FFM factor Openness/Intellect/Culture. This fact of FFM Openness/Intellect items and FFM Conscientiousness items not being differentiated by teachers or parents, rating or describing their children and pupils, echoes the results obtained by Mervielde in Belgium.

Even with all the discrepancies between the results of both CCQ-studies - partly due to the use of two different versions of the instrument - it is undoubtedly so that factor analysis in both countries revealed a factor that covers the essential meaning of FFM Conscientiousness in adults, however, mixed with meaning from other FFM factors, in particular from Openness.

In the Nijmegen study, Van Lieshout and Haselager (1992) found relatively high intercorrelations between the CCQ scores of fathers and mothers on the FFM related scales, and also between parents and teachers. For Conscientiousness these correlations were .61 and .56. Also the stability measures were relatively high. With 1-5 years between both ratings, teacher assessed CCQ Conscientiousness correlated between .54 and .64. And with two years in between, parental ratings correlated .80. Compared with stability ratings in the temperament literature (cf. Wachs, 1994) these are very high stability coefficients.

Block and Block developed their instruments CAQ and CCQ to measure the theoretical constructs of Ego Control and Ego Resiliency. These constructs are conceptualized as dynamic individual differences variables that have powerful organizing effects on behavior across time and contexts (J.H. Block & J. Block, 1980). Robins, John and Caspi (1994) nicely discuss the possible relations between these two constructs, as operationalized in the CAQ and CCQ, and the FFM related factors that in both studies reviewed above appeared to be binding 30-50% of the variance in the data. Robins et al. computed the usual scores for Ego Control and Ego Resiliency and found that Ego Undercontrol correlated positively (.51) with the (rationally constructed) scale for FFM Extraversion, and negatively with both Agreeableness (-.62) and Conscientiousness (-.60). Ego Resiliency correlated positively with Conscientiousness (.76), Agreeableness (.62) and Extraversion (.38), and negatively with Emotional Stability (-.68). It is clear from these data that Ego Resiliency and Ego Control are superordinate constructs of even broader scope than the Big Five. They are oblique vectors in the five dimensional space. Thus, the FFM factors seem to measure more homogeneous traits than the Block factors.

Conscientiousness in Free Descriptions by Parents, of Their Child's Personality Characteristics

The Big Five were originally found in personality language, more specifically in an unbiased selection from all personality relevant adjectives in the English dictionaries. Later, the Big Five were also found in studies done in other countries and languages. Following the studies using ratings on adjectives only, either unipolar or bipolar, came studies using sentences consisting of all kinds of words, like in most questionnaires for measuring temperament and personality.

For those interested in a similar approach to the structure of temperament and personality in childhood, no dictionaries are available of all words in a language used to describe the personalities of children. In an effort to compensate for this lack of a dictionary-based personality language relevant for children, researchers from several countries have decided to cooperate in making inventories of words and sentences used by parents (in some countries also teachers) when asked to freely describe their children's personalities (Havill, Allen, Halverson, & Kohnstamm, 1994; Kohnstamm, Mervielde, Besevegis, & Kalantzi, submitted; Kohnstamm, Halverson, Havill, & Mervielde, in press).

A category system was developed in which all personality relevant utterances of the parents, in audio-taped oral interviews, could be coded (the details of this system are to be found in the sources cited above). The system is FFM inspired, in that the first five categories are delineated according to the content of meanings attributed to the five factors in adulthood. The categories presumed to cover the Big Five are each subdivided into three subcategories. For Conscientiousness the description of the category is given in Table 5.

Table 5. *Description of the Category Conscientiousness in the Coding System Used to Categorize Child Personality Descriptors Generated by Parents*

3A:	Carefulness	
	3A +	3A -
	long attention span	forgetful
	good concentration	daydreamer
	responsible	careless
3B:	Dependability	
	3B +	3B -
	very loyal to his friends	no examples
	stands up for his friends	
	reliable	
3C:	Diligence, industriousness, persevering	
	3C +	3C -
	determined	needs motivation
	hard worker	lazy
	competitive	unwilling to work

Utterances or „descriptors” as generated by the parents are coded as either on the positive (+) or on the negative (-) side of the supposed dimensions. Descriptors seen by the coders as neither positive nor negative on the dimension at hand, are coded as „neutral”. After a large enough data set of descriptors has been collected, in different cultures and languages, questionnaire items are constructed meant to cover the whole domain of personality characteristics as generated by the parents in a particular culture. Questionnaires consisting of about 250 items are then given to new samples of parents, requesting them to rate their children on each of the items. After that, different techniques of factor analysis are used to see how much of a FFM structure is underlying the patterns of interitem correlations.

In this article we only provide some results of the first phase of collecting and coding the descriptors. Whereas in the different samples between 70 and 80% of the parent-generated descriptors could be coded in the first five FFM-inspired categories of our coding scheme, the percentages coded in category III, Conscientiousness, are relatively low and age-dependent. In figure 1 the percentages are presented for four age groups in the Dutch sample, separate for the descriptors coded as „positive” and „negative”.

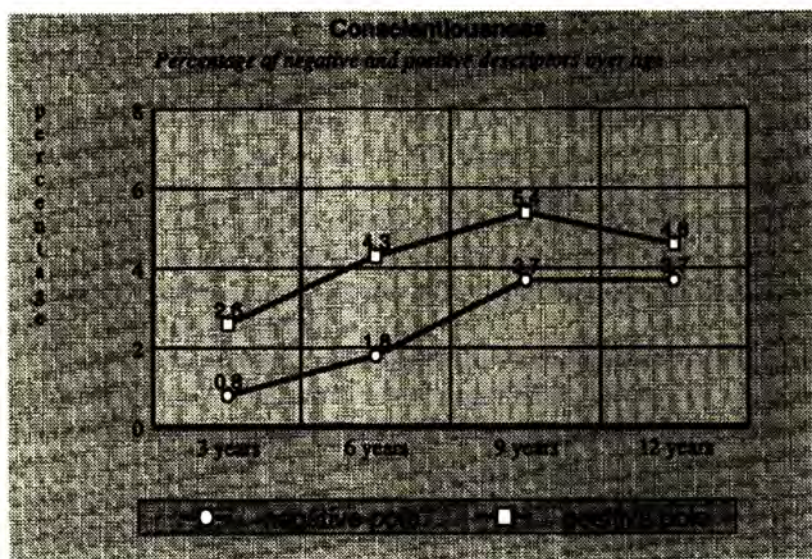


Figure 1. Percentages of descriptors coded as indicative of Conscientiousness in a Dutch sample of 324 parents describing a total of 193 children. Total number of descriptors for the four age groups: 1627, 2000, 1555, 1468.

On an average of about 20 codable descriptors per interview, an average of about 2 descriptors (10%) per interview for Conscientiousness is the maximum in middle childhood. This is also true for samples collected in the USA, Surinam, Belgium, Poland, and Greece. Only in a first *Chinese* sample of 400 interviews a percentage of *nineteen* was found for Conscientiousness-related descriptors.

In all samples the increase with age is replicated. Parents of preschool children rarely describe them in terms related to FFM Conscientiousness. But as soon as the child goes to school the category receives more descriptors from the parental interviews, because the corresponding child behaviors become more important to them. We predict that in collections of free pupil descriptions to be obtained from teachers, this category will receive many more descriptors, probably between 20 and 30 per cent.

Conscientiousness in Free Self Descriptions Generated by Children

Donahue (1994), inspired by the work of Livesly and Bromley (1973), analyzed the content of free personality descriptions generated by 106 11-

year-olds, using Kelly's Role Construct Repertory Test. The children's personality constructs were coded according to structural form (e.g., traits, facts, relationships) and Big Five content. Of 571 constructs for which the structural forms had been classified as traits, trends, preferences, skills or habits, 80% could be coded in the five FFM-inspired categories. The category Conscientiousness received 8% of all personality relevant descriptors, with 30% of the children using this category at least once. About half of these Conscientiousness descriptors (55%) were expressed as trends, one quarter as traits. Trends were defined as stylistic behaviors or typical reactions to classes of situations (e.g., works hard).

CONCLUSION

The data presented in this article, from examples of research done with instruments developed to be used for clinical situations (The Thomas-Chess questionnaire and the CCQ), for educational situations (the teacher rating scales TAB, SCHOB and GGBS), and for ordinary family situations (the free descriptions) suggest that from school age onwards a factor similar to FFM Conscientiousness is binding the variance caused by individual differences in a cluster of co-occurring behaviors, no matter who the observers are, parents, teachers or clinicians. But is it small wonder that for a factor covering such a broad domain as adult individual differences in ego-control, industriousness, order and morality, or, in different words, impulse control, work orientation and socialization, more or less related clusters of individual differences in childhood can be found? No, but given the belated recognition of the importance of this broad factor in adulthood, developmentalists should try to answer the question whether the roots of this factor in childhood also form a group and should be studied and assessed accordingly.

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AUTHOR NOTE

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