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# Noncognitive correlates of education

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**Abstract**

Native-born Estonian men ($N$=1495), 18–23 years old, participated in a study on relationships between the level of education and noncognitive characteristics of mind (so-called Characteristic Adaptations: attitudes, values, self-concept, etc.). In addition to Characteristic Adaptations, the model included parents' level of education, personality dimensions, cognitive ability, and word meaning structure variables that may mediate the relationships between the level of education and Characteristic Adaptations. It was found that, after the effect of background variables on the dependent variables was taken into account, the level of education was still related to noncognitive constructs in the model (collectivism, coping style, aggression, attitudes towards alcohol and narcotics, and self-esteem). A higher level of education was related to adaptive noncognitive characteristics of mind.


*Keywords:* Education; Personality; Attitudes; Values; Word meaning structure

## 1. Introduction

The objective of the education systems is to prepare young people to successfully face the challenges of society and derive benefit from the opportunities it provides. In psychological terms it means that the objective of the education system is to support the development of personality, which is "the dynamic organization within the individual of those psychophysical systems that determine his unique adjustments to his environment (Allport, 1937, p. 48)". Adjustment to the environment depends not only on cognitive abilities and skills but also on different dispositions, attitudes, values, and self-concept. In principle, this idea is reflected in the curricula of different countries. Along with knowledge and skills, attitudes and values are integral parts of the National Curriculum in several countries, such as, for example, England (National curriculum online, n.d.), New Zealand (The New Zealand Curriculum Framework, n.d.), Sweden (Skolverket, n.d.), and Estonia (Põhikooli ja gümnaasiumi riiklik õppekava, 2004). Usually attitudes and values in curricula are related to the development of self, relationships, and society. So, formal schooling should be associated with the attitudes and values promoted by curricula.

The majority of studies on the outcomes of education have been dedicated to academic–cognitive (school grades, results of academic tests, etc.) and social–economic (career success, average salary, socio-economic status, etc.) characteristics. Less is known about noncognitive correlates of education. To study noncognitive correlates of education it is not sufficient to include only measures of education and noncognitive characteristics in the study. The relationship between education and noncognitive characteristics, such as values, attitudes, or self-concept, may be mediated by cognitive characteristics. Correspondingly, cognitive measures must also be included in the study. In addition, noncognitive characteristics themselves can be divided in to two categories; enduring characteristics that are deeply rooted in the biological makeup of the organism and relatively immutable to social–cultural influences, and characteristics that develop in the interaction with the social–cultural environment. In order to take into account the complexity of the relationships between education and different characteristics of mind, it is necessary to include potentially important confounding constructs in the study too. A study that includes many different constructs faces another challenge. With many variables in a study the number of possible patterns of relationships between variables becomes enormously large. Therefore, we need to find a theoretically justified model for modeling relationships between the variables.

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We did not find in databases studies where complex relationships between mostly biologically determined personality and intelligence, education, and attitudes and values had been studied all together. There is a theory, however – the Five Factor Theory (FFT) of personality (McCrae & Costa, 1996, 1999) – that proposes a way in which different characteristics of mind and environmental influences may be interrelated. According to FFT, a personality system is composed of biologically determined Basic Tendencies that together with External Influences (Culture) affect Characteristic Adaptations. Basic Tendencies are five dimensions of personality: Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness. Characteristic Adaptations are all the psychological structures that people acquire in the course of life for getting along with the world. They include knowledge, skills, attitudes, goals, roles, relationships, schemas, scripts, habits, and self-concept. In FFT self-concept is of special significance, it depends in addition to Basic Tendencies and External Influences also on other Characteristic Adaptations.

For the purposes of this study, two modifications were introduced into the FFT. First, Basic Tendencies, by definition, should in addition to personality dimensions also include cognitive ability, which is also considered to be a mainly biologically determined characteristic of mind.

Second, it was hypothesised that cultural influences are mediated by word meaning structure (WMS). Theoretically, the human mind should be influenced by a cognitive factor, the way in which humans organize the world around them mentally (Toomela, 1996, 2003a,b). Human adults rely heavily on symbols, especially words. Words can be used intraindividually as "psychological tools", as tools for guiding thinking, memory, perception, emotion, and attention. The WMS may be systematically different in different people because of the way in which word meanings are constructed. In human cultures of today, the most common types of word meaning structures are so-called "everyday concepts" (or "complexes") and "scientific concepts" (Vygotsky, 1996; Vygotsky & Luria, 1994). These two types of WMS have been differentiated in developmental psychology (e.g., Luria, 1979; Nelson, 1996; Toomela, 2003b), in cultural psychology (e.g., Luria, 1979; Toomela, 1996, 2003a), and in neuropsychology (e.g., Funnell, 2001; Luria, 1979; Toomela, Tomberg, Orasson, Tikk, & Nômm, 1999). Words of the Everyday Concept type encode information on the basis of perceptual attributes of word referents and on the basis of the observation of events in everyday life; word meanings are tied to immediate sensory experiences (e.g., "'car' and 'bicycle' go together because both have round wheels"). Word meaning is, thus, constrained by the characteristics and contexts of external referents. Words of the Scientific Concept type encode information in the language; the structure of word meaning is abstract and hierarchical, its structure is formally logical, and it does not necessarily depend on the immediate reflection of reality (e.g., "'car' and 'bicycle' go together because they are vehicles").

In which way the dominant type of WMS is related to other characteristics of the mind is not yet fully understood. It is known that the development of the scientific word meaning structure is related to Westernized formal schooling (e.g., Cole, 1996; Cole & Scribner, 1974; Luria, 1974). Theoretically, WMS should also be related to Characteristic Adaptations because WMS characterizes the way of information processing in all psychological processes related to semiotic operations (cf. Vygotsky & Luria, 1994).

In this study Costa and McCrae's FFT is tested in order to understand better the role of education in Characteristic Adaptations and self-concept. Basic tendencies were assessed by a Personality Inventory and a Cognitive Ability Test. Characteristic Adaptations assessed in the study were Collectivism (three facets: Familism, Peers, Patriotism), Coping Styles (Task oriented, Social–Emotional, Avoidance oriented), Aggression (Physical, Verbal, Anger), Attitudes towards narcotics (two measures, one described attitudes and the other described motivation to use narcotics or alcohol). Self-concept was assessed as Self-esteem. In addition, the family background, which includes both biological and cultural influences, was described by the parents' level of education.

### *1.1. The model tested in this study*

In order to differentiate the possible role of education in the individual differences in Characteristic Adaptations it is necessary to rule out effects of confounding variables, especially personality and cognitive ability. The complex model of relationships has to be tested in one step. The main characteristics of the model tested in this study are represented in Fig. 1. Following the FFT, it was assumed that personality dimensions and cognitive ability affect the level of education, Characteristic Adaptations and Self-Concept. The level of education, theoretically, is affected by Basic Tendencies. Thus, it can be assumed that personality dimensions and cognitive ability of children is affected by the level of education of their parents. The level of education should affect other Characteristic Adaptations both directly and through the mediation of WMS. Self-Concept, in turn, should depend on all other variables in the model.

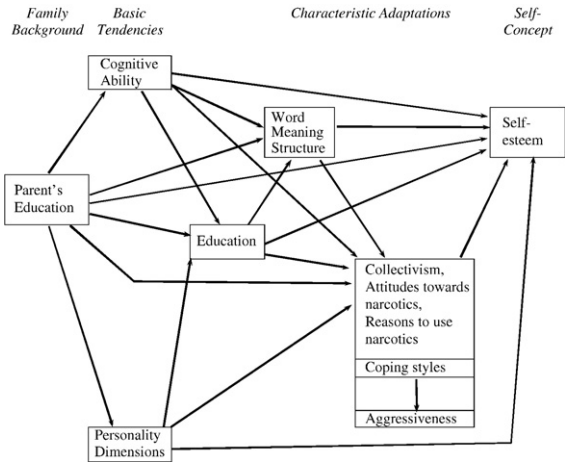


Fig. 1. A representation of the system of relationships between Basic Tendencies, Education, Word Meaning Structure, Characteristic Adaptations and Self-Concept tested in this study.