

Interindividual stability of personality traits of children aged 9-14: a longitudinal study

MIHÁLY GÁSPÁR

The present study aims at demonstrating how interindividual differences in personality factors may vary, by use of data collected in a longitudinal research measuring school age children at the age of 9, 12 and 14. We analyzed Impulsivity (I), Venturesomeness (V) and Empathy (Emp) of the Eysenck personality factors together with trait and test anxiety as well as creativity.

Correlations between data of individual measurement points showed a moderate degree of stability of IVE factors ranging between .20 - .50. Trait and test anxiety underwent a slow but steady change during the 5-year period while creativity was found as the least stable of personality factors measured. Research findings were ultimately congruous with major theories of personality development.

The present paper aims at the analysis of the relationships between stability and change of personality traits as manifested in a longitudinal study carried out for the practical reasons of providing feedback for educationalists on the impact of an alternative school program using control groups.

In addition to the much evidenced global dimensional approach in assessing personality traits, Block (Block, 1971, Block & Block, 1980) maintains that a person-centred, typological approach allows one to identify coherent patterns of dispositions and behaviours over the course of life thereby to understand how they change and to which outcome they lead. Over the years a number of longitudinal studies that have assessed different personality dimensions (activity level, impulsivity, aggression, etc.) through different methods (*Q-sort*, self-reports, ratings) have converged to describe similar patterns and types that are relatively stable over time and are connected to psychological adjustment (Block, 1993; Caspi & Silva 1995; Magnusson, 1998; Pulkkinen, 1996). Research findings of the above longitudinal studies confirm three basic types: undercontrolled, inhibited and well adjusted.

The stability of personality is one of the fundamental enquiries of psychology (Allport, 1937; Carver & Scheier, 1995). Most of the related studies look at the stability of the well known personality traits or dominant traits in adults (See e.g., Costa & McCrae, 1997, 1999; Costa, McCrae &

Arenberg, 1980; Asendorpf, 1992.). As opposed to absolute stability, which refers to the maintenance of an attribute over time, Costa & McCrae (1997, 1999) in reviewing a large body of longitudinal studies examine *relative stability* referring to the maintenance of one's standing in relation to others, that is to the stability of interindividual differences. They found that people's relative standing on self-report measures often is remarkably stable over long periods of time.

It is clear, however, that none of the findings of trait stability research carried out with adult subjects could be regarded indicative of results found when testing children. Asendorpf and Van Aken (1991) replicated Ozer and Gjerd's (1989) longitudinal study comparing highly consistent and highly inconsistent children to a middle group and found a temporal consistency in personality patterns. Though there were large individual variations in consistency, they found that children's ego-resiliency predicted the consistency of their personality patterns. They also found that items typical for consistent children changed with age, in accordance with major developmental tasks. Similar to their findings on personality consistency in preschool, later age personality consistency was also confirmed.

On the other hand, Baltes and his colleagues (Baltes et al., 1998, 1999) argue that the control mechanisms of a given behaviour may be totally different in childhood, middle adulthood and old age. Similarly, Rothbart (1989), Rothbart et al. (1994, 1998) report on interesting findings on the relationships between early-childhood behaviour patterns and personality variables in adults. This presumed relationship raises the issue of joint examination of conti-

Mihály Gáspár, Berzsenyi College, 9700 Szombathely, Károly G. tér 4., Hungary. (Correspondence concerning this article should be sent to this address).

nity and stability of personality traits (Caspi, Bem & Elder, 1989; Caspi, 2000) which also serves as the focus for the work of Caprara and Cervone (2000).

The present study is centred around the issue of stability of some of the personality traits of children between the age of 9-14 from which we do not wish to generalise over all theories either on the stability or the continuity of personality traits in childhood and in adulthood.

Data were collected from over 200 school age children at three measurements relating to three areas of personality and cognitive functioning that include:

- some aspects of personality traits such as Impulsivity, Venturesomeness and Empathy,
- aspects of anxiety such as trait and test anxiety,
- divergent thinking indicative of creativity.

The longitudinal study followed children's development from the age of 9 to 14. The present study aims to look at some of those research findings that point beyond the scope of the impact study prepared for teachers and reveal data on the *stability of certain areas of personality* at a given age. Data show that some aspects of personality may or may not undergo changes, i.e. their susceptibility to modifications may - to a large extent - vary.

A brief history of ideas related to personality

Ever since Hippocrates (460 BC) there has been no lack of scholarly studies devoted to the identification of the innermost core of personality. Due to constraints of length we hereby endeavour only to give a brief overview of modern time theories.

The founder of trait theory, Allport regarded the existence of personality traits as conclusive evidence. He argues that no one, not even psychologists can deny the fact that behind all forms of behaviour in mature adults there are identifiable dispositions and traits. (Allport 1937, 1961) In everyday life these are manifest in language. Allport and Odbert (1936) have managed to identify 18.000 personality relevant terms in English alone, which amounts to a bigger vocabulary than that of Shakespeare.

Of course one cannot always rely on the words, as they appear in everyday usage, for they are often unclear and ambiguous. Little wonder that attempts made at their clarifications utilised factor analysis to classify terms. One of the prominent researchers in the field, Cattell (1946) was trying to identify those independent dimensions that derive from linguistic analysis, and are therefore rooted in empirical data. Cattell also came up with the since renowned 16 factor-model with related assessment methods (Cattell, Eber & Tatsuoka, 1977).

Around the same time, Eysenck started to work on his hierarchical structure model (Eysenck & Eysenck, 1969) publishing their final version in 1991 (Eysenck & Eysenck, 1991).

Another much used model is the Big Five, described by Norman (1963) who argues that independent dimensions could be reduced to 5 major types. A vast body of papers has so far dealt with the variations of the Big Five model, the overview of which is best summarised by Costa and McCrae (1992), McCrae and Costa (1996, 1999) and Caprara and Cervone (2000). Common to these models is the fact that they maintain that personality traits organised by factor analysis and by various independent sources can be classified into five main groups of factors. While these theories all agree on the number of factors, the contents and the names of factors are constantly debated in an attempt to search for an organising principle that lends relative stability to the functioning of personality. Similarly, Carver and Scheier (1995) regard the study of the aspects of the psychological mechanisms including their relative stability as a profound focus of inquiry in addition to the individual differences.

In addition to the above detailed personality trait models and ideas, studies often focus on those psychological factors whose stability are far less unambiguous such as the dispositional and motivational factors of personality. For the purpose of inquiry the issue of anxiety falls into this category, too. Within anxiety researchers tend to look at trait anxiety as a factor that is determined prior to the age 6-7 and shows relative stability after that. Test anxiety, however, stabilises during school age as it is induced by education.

The third area we look at in our paper refer to trait like abilities that tend to be flexible for longer period of time in one's life cycle, therefore room for individual development may exist even in adult life.

We have to point out here that neither change nor stability is regarded in the absolute sense. This means that stability of traits could be interpreted as a comparison between them. As Matthews and Deary (1998) point out, there are two types of stability, one is the stability of the mean trait levels, that is, groups of people as a whole may or may not show changes in the mean score on a trait regardless of individual differences, and the other form of stability is individual related to individual differences in trait levels that may or may not be stable regardless of any changes in mean trait level. This latter is called interindividual stability or stability of individual differences and is the focus of our present study, i.e. the correlation of test-retest. Although Asendorp (1992) suggests another way of measurement, we decided to stay with this traditional correlation testing.

nity and stability of personality traits (Caspi, Bem & Elder, 1989; Caspi, 2000) which also serves as the focus for the work of Caprara and Cervone (2000).

The present study is centred around the issue of stability of some of the personality traits of children between the age of 9-14 from which we do not wish to generalise overall theories either on the stability or the continuity of personality traits in childhood and in adulthood.

Data were collected from over 200 school age children at three measurements relating to three areas of personality and cognitive functioning that include:

- some aspects of personality traits such as Impulsivity, Venturesomeness and Empathy,
- aspects of anxiety such as trait and test anxiety,
- divergent thinking indicative of creativity.

The longitudinal study followed children's development from the age of 9 to 14. The present study aims to look at some of those research findings that point beyond the scope of the impact study prepared for teachers and reveal data on the *stability of certain areas of personality* at a given age. Data show that some aspects of personality may or may not undergo changes, i.e. their susceptibility to modifications may - to a large extent - vary.

A brief history of ideas related to personality

Ever since Hippocrates (460 BC) there has been no lack of scholarly studies devoted to the identification of the innermost core of personality. Due to constraints of length we hereby endeavour only to give a brief overview of modern time theories.

The founder of trait theory, Allport regarded the existence of personality traits as conclusive evidence. He argues that no one, not even psychologists can deny the fact that behind all forms of behaviour in mature adults there are identifiable dispositions and traits. (Allport 1937, 1961) In everyday life these are manifest in language. Allport and Odbert (1936) have managed to identify 18.000 personality relevant terms in English alone, which amounts to a bigger vocabulary than that of Shakespeare.

Of course one cannot always rely on the words, as they appear in everyday usage, for they are often unclear and ambiguous. Little wonder that attempts made at their clarifications utilised factor analysis to classify terms. One of the prominent researchers in the field, Cattell (1946) was trying to identify those independent dimensions that derive from linguistic analysis, and are therefore rooted in empirical data. Cattell also came up with the since renowned 16 factor-model with related assessment methods (Cattell, Eber & Tatsuoka, 1977).

Around the same time, Eysenck started to work on his hierarchical structure model (Eysenck & Eysenck, 1969) publishing their final version in 1991 (Eysenck & Eysenck, 1991).

Another much used model is the Big Five, described by Norman (1963) who argues that independent dimensions could be reduced to 5 major types. A vast body of papers has so far dealt with the variations of the Big Five model, the overview of which is best summarised by Costa and McCrae (1992), McCrae and Costa (1996, 1999) and Caprara and Cervone (2000). Common to these models is the fact that they maintain that personality traits organised by factor analysis and by various independent sources can be classified into five main groups of factors. While these theories all agree on the number of factors, the contents and the names of factors are constantly debated in an attempt to search for an organising principle that lends relative stability to the functioning of personality. Similarly, Carver and Scheier (1995) regard the study of the aspects of the psychological mechanisms including their relative stability as a profound focus of inquiry in addition to the individual differences.

In addition to the above detailed personality trait models and ideas, studies often focus on those psychological factors whose stability are far less unambiguous such as the dispositional and motivational factors of personality. For the purpose of inquiry the issue of anxiety falls into this category, too. Within anxiety researchers tend to look at trait anxiety as a factor that is determined prior to the age 6-7 and shows relative stability after that. Test anxiety, however, stabilises during school age as it is induced by education.

The third area we look at in our paper refer to trait like abilities that tend to be flexible for longer period of time in one's life cycle, therefore room for individual development may exist even in adult life.

We have to point out here that neither change nor stability is regarded in the absolute sense. This means that stability of traits could be interpreted as a comparison between them. As Matthews and Deary (1998) point out, there are two types of stability, one is the stability of the mean trait levels, that is, groups of people as a whole may or may not show changes in the mean score on a trait regardless of individual differences, and the other form of stability is individual related to individual differences in trait levels that may or may not be stable regardless of any changes in mean trait level. This latter is called interindividual stability or stability of individual differences and is the focus of our present study, i.e. the correlation of test-retest. Although Asendorp (1992) suggests another way of measurement, we decided to stay with this traditional correlation testing.

Empirical studies on stability

There are numerous studies investigating stability of certain traits with test-retest method, including that of Costa and McCrae (1977) incorporating data collated over a ten year period. They found a 0.70-0.84 correlation in extraversion while anxiety and neuroticism ranged between 0.58-0.69.

In a later study, Costa, McCrae and Arenberg (1980) used the Guilford Zimmerman Temperament Survey (GZTS) in study of over 400 male graduates who formed part of the Baltimore Longitudinal Study of Aging (BLSA). Different age groups - young, middle-aged and old - showed no differences in personality trait stability.

It must be noted here that all the above data related to studies carried out among adults. There is a surprising shortage of studies concerning stability of traits in childhood. Haan, Millsap and Hartka (1986) included the childhood stability of traits as a part of their life span study and found relatively low level of stability, ranging from 0.2 to 0.4.

It is worthwhile to refer to the study of Magnusson and Backteman (1978) who - by looking at the stability of intelligence and creativity - found that the stability of creativity ranged between 0.42-0.45 while intelligence showed a remarkable 0.75 stability. Intelligence was assessed at 10 to 15 years of age while creativity was measured around 13-16 years.

In general, it is reasonable to conclude that the stability of trait like psychological factors in childhood and adolescence tend to be lower than in adult life. Intelligence is one of the abilities which has a demonstrated stability at a younger age. The present study aims at examining this type of stability centred around the test-retest correlation values.

Factors in the three areas examined including personality traits, anxiety and creativity

Personality factors

In addition to the commonly known Eysenck factors (psychotism, extraversion, neuroticism, i.e. PENL) - which have been adapted into Hungarian (Eysenck, Kálmánchey & Kozéki, 1981) - three new factors and their assessment methods were developed by Eysenck, including Impulsivity, Venturesomeness and Empathy (IVE).

These have proved to be fairly useful (Eysenck, Easting & Pearson, 1983) and were adopted for Hungarian use by Kozéki (Kozéki & Eysenck, 1985)

The interpretation of IVE factors and their relation to PEN factors are as follows.

Similarly to psychotism, *impulsivity* is originated from the E (Extraversion) dimension. The impulsive person is risk-taker, disinclined to planning, vibrant and careless. The person who is classified as *venturesome* is searching risk and adventure, has a low tolerance of monotony, and is neither shy nor timid. While both types thrive on risk, the impulsive person has no idea of what he is risking as he tends to act on the spur of the moment, whereas a venturesome person deliberately faces the challenge of risk-taking. Hence, it follows that Impulsivity (I) can closely be related to Psychotism (P) and Neuroticism (N) and only then to Extraversion (E).

Empathy (Emp) appears as an independent dimension. This dimension includes both interpretation of empathy as described in literature. The first one is a behaviour aspect of cognitive role taking, and the second one is the emotional response to the other person's emotional state. Therefore, an emphatic person is understanding, exhibits a keen interest in others and tactful. Hence, it is unlikely to correlate with I or V, yet may relate to N (Kozéki & Eysenck, 1985).

The general value of Eysenck personality factors has long been demonstrated in numerous cross-cultural studies (Eysenck, Barret & Barnes, 1993; Eysenck, Makoremi & Barret, 1994; Eysenck & Eysenck, 1982; Eysenck, Kozéki & Kálmánchey, 1980).

Anxiety factors

Some forms of anxiety manifest themselves as trait like even if not in an unambiguous way.

Spielberger (1966) and Zuckerman (1976) look at their consistency as well as investigate their trait-state aspects. It appears that *trait anxiety* tends to stabilise at a fairly early age, prior to school age, and therefore is not really susceptible to change. Although interactionists' approach points out that the personality - situation as well as the aptitude - treatment interactions may go a long way to alter the picture (Snow, 1989, 1992), in terms of consistency the issue of test- anxiety lends itself to controversy, especially regarding its effect on achievement. The class-dependent nature of test-anxiety and achievement is pointed out by Helmke (1988), and Helmke and Weinert (1996, 1999) who argue that the correlation between test-anxiety and achievement is grossly determined by the quality of the educational atmosphere in the given class.

It is interesting to note Mueller's (1992) distinction that differentiates between test-anxiety as trait-like quality and test-anxiety generated when students fail to prepare for the test. No such distinction is made in most of the test-anxiety studies, despite the fact that - like in case of the poor - the

deserving and the undeserving category may profoundly alter or change the conclusions.

In our present study - mostly relying on Spielberger - we have separated test-anxiety into two subscales: *test worry* and *test emotionality*. From previous studies it becomes apparent that it is only test worry that adversely affects achievement. Test emotionality, on the other hand, may have an optional middle zone in terms of its impact on achievement as described by the Yerkes and Dodson rule. In our study the questionnaire of Sipos, Sipos and Spielberger (1988/a) was used with the same children at various measurement points assessing test worry and test emotionality.

Creativity factors

The interpretation of creativity through research findings is rather complex given the fact that creative achievement is undoubtedly the result of correlation among a multitude of factors (Eysenck, 1993; Stenberg & Lubart, 1995, 1999; Amabile, 1983; Gruber, 1989). In addition to personality traits, the developmental level of abilities, motivation and a number of other factors that are operational in creative achievement can be identified such as the quality of micro and macro environment, the opportunities presented by historically determined domain.

On the other hand, issues in psychometric research are challenged such as the ability of divergent thinking as predictive feature. Many argue that creativity assessed with test is different from real life creativity (Baer, 1994; Zeidner, 1995).

This does not in any way make psychometric research redundant. On the contrary, we hope to find out how consistent the factors assessed in divergent tests are during the school years between 9-14 years of age. For this reason we tested figural and verbal creativity as detailed below.

Predictions

Based on earlier studies the following expectations were outlined:

The Eysenck factors assessed become consistent prior to school age and are unlikely to change significantly.

The interindividual stability of factor groups rankings are as follows: a) Eysenck IVE factors; b) Anxiety factors; c) Ability factors of creativity.

Trait-anxiety tends to be more stable and is different from test-anxiety.

Variables of creativity undergo major changes through the school years, i.e. their stability, especially at the beginning of the school education is fairly low.

Within the ability-like creativity factors, figural and verbal creativity are distinct. Similarly qualitative and quantitative variables such as fluency, flexibility, originality as well as relative flexibility and relative originality are separate categories.

METHOD

The alternative education programme was designed to enhance skills and personality development in an age-appropriate way. Its wider objective was to create a humanistic school environment that is responsible to societal needs. While age-appropriateness determined the quality of differentiated personality development, the development of particular skills took place in clusters comprising children with similar competency level. Within any given age group 3-4 clusters were taught different course content by different methods. While assessment criteria for the particular cluster reflected realistic expectations, evaluation of performance was standardised.

Measures

We administered two instruments for the measurement of anxiety, Hungarian adaptation of the Trait Anxiety Inventory (Sipos, Sipos & Spielberger 1988/b) and Hungarian adaptation of the 'Test Anxiety Inventory' (Sipos, Sipos & Spielberger, 1988/a).

Variables of anxiety: Trait Anxiety Inventory: *Trait Anxiety*; Test Anxiety Inventory: *Test Anxiety*; incorporating two further subscales: a) *Test Worry*, b) *Test Emotionality*.

Eysenck personality variables

We used Hungarian adaptation of Eysenck et al. (1983) IVE - Impulsivity - Venturesomeness - Empathy inventory (Kozéki & Eysenck 1985; Variables: Impulsivity, Venturesomeness, Empathy).

Creativity measures

For the measurement of creativity the well-known Guilford divergent-thinking test was used. Figural and verbal items were used separately as follows:

Figural items include: Three lines test, Guilford and Hoepfner (1965; cited in Barkóczi and Pléh, 1977); Torrance circles, Torrance (1974).

Verbal items include: The story of the flying monkey (used only at the first test wave), Torrance (1974) adapted

by Barkóczi and Pléh (1977); Distant association test (used only at the second and third test waves; Barkóczi & Klein, 1968); Unusual uses, Barkóczi and Klein (1968).

The exchange of items was applied in order to enhance validity. For this reason the comparison of the data of 2 and 3 test measurement points is relevant only.

Creativity variables include variables of *figural/verbal creativity*: 1) figural/verbal originality; 2) figural/verbal flexibility; 3) figural/verbal fluency; 4) relative figural/verbal originality; 5) relative figural/verbal flexibility.

Relative originality and *relative flexibility*, i.e. originality and relativity minus fluency are indicators of predictive reliability and are calculated by dividing originality and flexibility by fluency. Runko and Albert (1985) and Zétényi (1989) recommend such usage too. We argue that this sort of relative scores prove to be *qualitative* as opposed to *quantitative* indicators thus increasing the reliability of psychometric testing.

Sample and procedure

In the longitudinal study data were collected at three different measurement points and in addition to the above factors information on students socio-economic status (SES) and school achievement were included in the survey.

Dates when testings were carried out: I. in 1991: subjects in their 3rd grade - 9 year old students; II. in 1994: subjects in their 6th grade - 12 year old students; III. in 1996: subjects in their 8th grades - 14 year old students.

There was a control group for each class in a school with traditional curriculum, similar in size and perceived quality. Testing took place roughly at the same time in four parallel classes in both types of school without the presence of teachers and carried out by college undergraduates. What made comparisons a bit difficult was the fact that the

SES value of the students attending alternative education programme turned out to be significantly lower than those of the control classes ($t(212)=-3,478, p<.001$). The problem of SES is beyond the scope of this paper and our analysis covers the joint sample of the two schools.

Groups of factors and the number of subjects tested by testing dates (tests waves) by schools are shown in Table 1.

Table 1 shows the total number of subjects measured at the three measurement points by gender and the type of tests undertaken. It is also apparent that only about 40% of the total number of subjects were tested for creativity.

RESULTS

Gender specific research findings

We looked at the differences between the sexes in order to identify where it is justifiable to combine their data and alternatively when they have to be treated separately. We argue that separation seems practical when there are significant differences not only in the mean levels but also in the tendencies and patterns as well. It appeared that only for a few variables were such gender specific separations needed.

The changes of mean levels for girls and boys as well as the effect of gender were tested via a mixed two-way ANOVA design with the gender as a grouping factor, and the three measurement points as a trial factor (ct. Table 1). Calculations were made by the MiniStat statistical program package (Vargha & Czigler 1999), which performs not only the conventional ANOVA tests but also their robust versions, the Welch test for the main effect of the grouping factor (Wilcox, 1996, p. 219), and the Huynh-Feld correction for the interaction term and the main effect of the trial

Table 1
Number of children tested

	I-II. Measurement points*		II-III. Measurement points**	I-III. Measurement points***	
	Personality	Creativity	Full test set	Personality test	Creativity
Boys	77	30	63	70	30
Girls	96	36	84	91	35
Total	173	66	142	161	65

* represents the number of subjects tested at the first and second measurement points by gender and type of tests

** represents the number of subjects tested at the second and third measurement points by gender and type of tests

*** represents the number of subjects tested at the first and third measurement points by gender and type of tests

factor (Maxwell & Delaney, 1990, p. 477). In the case of a significant trial factor result the post hoc pairwise comparisons of the trial factor levels were performed via Tukey's method (Winer, 1971, p. 198). Significant conventional ANOVA results were taken into account only if their corresponding robust tests were also significant.

Given the fact that the present study aims at analysing the stability of variables the gender specific values or the trial factors on their own are not as relevant as their interaction. Having tested all the variables we found significant correlation between gender and age in two particular instances, i.e. anxiety and empathy. On these variables both gender and age had a significant influence. Gender specific influence in trait anxiety is $F(1,137)=29,78, p<.01$; age factor (trial factor) is $F(2,238)=92,02, p<.01$ and their interaction is $F(2,238)=14,56, p<.01$. In case of empathy gender specific influence was $F(2,275)=73,74, p<.01$; trial factor was $F(2,275)=11,64, p<.01$; and their interaction was $F(2,275)=6,64, p<.01$. In these particular instances it is worth looking at values of stability by gender, whereas this may not be necessary in case of the other variables. Therefore in the analysis of the stability of inter-individual differences of anxiety and empathy gender specific differences will also be looked at.

Inter-individual stability by factor groups

Results with the Eysenck's IVE factors are seen in Table 2. As we indicated before international studies found a correlation of 0.2-0.4 typical to this age groups. This coincides with our findings, however the correlation became stronger at the age of around 12-14 years. As we pointed out before, gender differences in empathy should be looked at. We found that girls showed a stronger correlation with no significant differences however.

The trait anxiety results are seen in Table 3. The inter-individual stability of Trait Anxiety is fairly high between

9-12 years of age ($r(173)=.561, p<.001$) yet undergoes significant changes by the age of 14. As we saw before in the change of mean level, changes between 12-14 years of age are fairly significant (the mean value increases from 33,89 to 40,67).

This means that such a significant change may be accompanied by a change in individual differences as well. This is supported by the following correlation: Trait Anxiety at 9-12 years $r(173)=.561$ as opposed to Trait Anxiety at 12-14 years $r(147)= -.045$, and Trait Anxiety at the age of 14 $r(158)=.052$. As we indicated before, in case of trait anxiety it seems reasonable to look at values of stability of boys and girls separately. Having done that we compared correlation within each group and found no significant differences between the stability of trait anxiety of boys and girls, ($z = 0,22, p>.1$ at age 9-12; $z = 0,13, p<.1$ at age 12-14; and $z = 0,58, p>.1$ at age 9-14).

It is interesting to point out the fact that while trait anxiety correlates to other trait-like factors at the first and second measurement points, at the third measurement point it does not correlate with any of the factors.

One explanation could be the possibility that around the age of 14 trait anxiety is tied up with factors - not tested by us - which are typical to problems associated with adolescence. Earlier, around 9-12 years it forms an integral part of the personality together with the factors tested in our research. Further research could find out if independence of this factor is temporary or permanent.

Although stability of the factors of test anxiety was weaker than what we found in the case of IVE factors, in terms of their quality they seemed alike. Stability of test anxiety was shown ($r(173)=.203$) between the age of 9-12 (except for emotionality with $r(173)= .12$) yet by the age of 14 there was no sign of correlation, i.e. individual differences rearranged themselves. This rearrangement must have taken place prior to the age of 12 as the correlation between the 12-14 measurements was fairly high (.36 - .495).

Table 2

Correlation of IVE factors between measurement points

	$R_{12} (n = 173)$	$R_{23} (n = 147)$	$R_{13} (n = 158)$
Impulsivity	.201**	.501**	.328**
Venturesomeness	.345**	.458**	.249**
Empathy	.377**	.489**	.286**

R indicates correlation between test measurement points, 1, 2 and 3 respectively.

** $p<.001$

Table 3

Correlation between measurement points 1, 2 and 3 in Test anxiety

	R_{12} ($n = 173$)	R_{23} ($n = 147$)	R_{13} ($n = 158$)
Test Anxiety	.203**	.495**	.066
Test Worry	.273**	.363**	.083
Test Emotionality	.120	.443**	.046
Trait Anxiety	.561**	-.045	.052

R indicates correlation between test measurement points, 1, 2, and 3 respectively.

** $p < .001$

Table 4

Correlation between measurement points 1, 2 and 3 in figural creativity

	R_{12} ($n=66$)	R_{23} ($n=146$)	R_{13} ($n=64$)
Figural originality	.379**	.306**	.130
Figural flexibility	.269*	.310**	.111
Figural fluency	.479**	.450*	-.040
Figural relative flexibility	-.002	.125+	-.025
Figural relative originality	-.076	.182*	.001

R indicates correlation between test measurement points, 1, 2, and 3 respectively.

** $p < .001$; * $p < .05$; + $p < .1$

Table 5

Correlation of variables of verbal creativity between 2 and 3 measurement points

	R_{23} ($n = 145$)
Verbal Originality	.327**
Verbal Flexibility	.262**
Verbal Fluency	.303**
Verbal Relative Flexibility	.002
Verbal Relative Originality	.168*

R indicates correlation between results obtained in measurement points 2, and 3.

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

Creativity

Correlational results with the quantitative data of figural creativity are seen in Table 4.

Individual differences in originality and flexibility undergo permanent changes and from the age of 9 to 14 they are completely rearranged. It is fluency that shows interesting modification, whereas stability measured in every 2-3 years is fairly strong (.45 - .47) yet diminishing over the five years (.04).

It appears from above that qualitative factors of figural creativity show the least stability, and from time to time can undergo major rearrangement in childhood.

Verbal creativity

Results with the verbal creativity are seen in Table 5.

In terms of verbal creativity we can only compare data collected between 12-14 years of age as at the age of 9 we replaced some items. Our research findings showed a similarity with the figural creativity data, i.e. quantitative data showed certain stability (.26 - .32) yet no correlation among qualitative indicators were found.

DISCUSSION

The present paper dealt with the analysis of the stability of individual differences through data collected in a longitudinal study. More specifically, we wanted to find out if there are significant differences in consistency among the various aspects of personality between the age of 9 and 14, and for this reason we looked at three distinct areas of personality.

We anticipated that the most stable of these would be the personality traits, namely the Eysenck IVE factors. Similarly, we presumed that anxiety, especially trait anxiety would prove to be fairly stable, while the stability level of test anxiety was expected to be lower. Within the structure of ability it was the ability of divergent thinking connected to creativity that we expected to be most susceptible to change. Ultimately, the present inquiry centres around one of the most profound issues of the psychology of personality, i.e. the stability vs. instability of individual differences as described by Carver and Scheier (1995).

Most of the research focusing on the stability of individual differences have been carried out on adults (e.g. Costa, McCrae 1997; Costa, McCrae & Arenberg, 1980) whereas relatively few studies of this type were done on the younger population mostly as part of life-span studies (e.g. Magnusson & Bacteman, 1978; Haan, Millsap & Hartka, 1986; Asendorpf, 1992). While stability level of individual differences among adults ranges around .7 - .9, children typically demonstrate much lower level of stability (.2 - .4). It must be pointed out here that there are various values attached to the analysis of stability, including reliability, trait stability and the stability of inter-individual differences. This latter was the focus of our inquiry measuring the correlation coefficient of data collected at different measurement points. Reliability can be indicated by a test-retest correlation at short intervals, or by the internal consistency measures, e.g., split-half reliability coefficient, or Cronbach alpha coefficient. Naturally, reliability of questionnaires as indicated by the authors was tested on other samples and Cronbach alpha coefficients of .7 - .8 was found.

The longitudinal research consisted of three sets of data collection: the first carried was out at the age of 9, then at 12 and 14. Tests applied included the Eysenck IVE questionnaire (Kozéki & Eysenck, 1985), the Trait Anxiety Inventory (Sipos, Sipos & Spielberger, 1988/b), and the Test Anxiety Inventory (Sipos, Sipos & Spielberger, 1988/a), as well as the Guilford and Torrence tests measuring the ability of divergent thinking (Barkóczy & Pleh, 1977; Barkóczy & Klein, 1968).

The total number of children tested was 221, yet the overall number of useful data was less than that. It was

found that the correlation among the data collected at the different measurement points - to some extent - supported our working hypotheses. First, the coefficient of IVE variables ranged between .201 - .501 which supports previous research findings (Haan, Millsap & Hartka, 1986; Asendorpf, 1992) reflecting relative stability of personality traits. In terms of anxiety, a *considerably* lower level of values was found. While it is true that the correlation between the first and second measurement points is fairly high (.561) we found a remarkably low level of correlation between data collected at the first and third measurement points (.045-.083). This - especially in the case of trait anxiety - seems rather difficult to explain. Perhaps a new type of anxiety related to adolescence may cause such dramatic change.

Regarding test anxiety, considerable changes are underway between the age of 9-14, which however seem to set at a level typical to the individual reinforced by school assessment, as early as 9-12 years of age. In terms of the particular variables of creativity that were measured a lower level of stability was found. While quantitative data showed some form of correlation over a 2-3 year period, qualitative indicators reflected an almost total lack of stability of interindividual differences.

Then we looked at gender specific differences in our research findings. Comparing mean levels there are some differences between boys and girls data, yet no significant differences were found in indicators of stability.

Summing up, we found that in addition to some fundamental issues related to personality psychology that are raised as a result of this research, the study can also be instrumental in offering recommendation for educationalists. More specifically, it is reasonable to suggest that the abilities connected to creativity can best be developed as we found significant inter-individual changes. Also efforts on the part of school educators should be made to reduce anxiety due to students' assessment, especially prior to the age of 10 when the individual levels set in. On the other hand, general personality factors - such as the IVE factors tested in our research - seem to be more reluctant to change, therefore cannot be realistically modified by education.

REFERENCES

- ALLPORT, G. W., ODBERT, H. S.(1936). Trait names: Apsycho-lexical study. *Psychological Monographs: General and Applied*, 47, (I. Whole No. 211).
- ALLPORT, G.W.(1937). *Personality: A psychological interpretation*. New York, Holt: Rinehart, & Winston.

- ALLPORT, G.W.(1961). *Pattern and growth in personality*. New York, Holt: Rinehart & Winston.
- AMABILE, T. M. (1983). *The social psychology of creativity*. New York: Springer-Verlag.
- ASENDORPF, J.B.(1992). Beyond stability: Predicting inter-individual differences in intra-individual change. *European Journal of Personality* 6, 103-117.
- ASENDORPF, J.B., & VAN AKEN, M.A.G. (1991). Correlates of the temporal consistency of personality patterns in childhood. *Journal of Personality*, 59, 689-703.
- BAER, J. (1996). Does artistic creativity decline during elementary school? *Psychological Reports*, 78, 927-930.
- BALTES, P. B., STAUDINGER, U. M., & LINDENBERGER, U. (1999). Lifespan psychology: Theory and application to intellectual functioning. *Annual Review of Psychology*, 50, 471-507.
- BALTES, P. B., LINDENBERGER, U., & STAUDINGER, U. M. (1998). Life-span theory in developmental psychology. In W. Damon (series Ed.) & R. Lerner (Vol. Ed.), *Handbook of Child Psychology* (5th Edition). Vol. 1: *Theoretical models of human development*. (pp. 1029-1144). New York: Wiley.
- BARKÓCZI, I., & KLEIN S. (1968). Gondolatok az alkotóképességről és vizsgálatának egyes problémáiról. Thoughts on creativity and the problems of its testing *Magyar Pszichológiai Szemle*, 25, 508-514.
- BARKÓCZI, I., & PLÉH, C. (1977). *Kodály zenei nevelési módszerének pszichológiai hatásvizsgálata [Psychological impact study of the Kodály musical education methodology]*. Bács megyei Lapkiadó Vállalat, Kecskemét.
- BLOCK, J. (1971). *Lives through time*. Berkeley, CA: Bancroft Books.
- BLOCK, J. (1993). Studying personality the long way. In D.C. Funder, R.D. Parke, C. Tomlinson-Keasey, and K. Widaman (Eds.), *Studying lives through time: Personality and development* (pp. 9-41). APA Science Volumes. Washington, DC: American Psychological Association.
- BLOCK, J., & BLOCK, J.H. (1980). The role of ego-control and ego resilience in the organization of behaviour. In W.A. Collins (Ed.), *Minnesota symposium on child psychology. Vol.13: Development of cognition, affect, and social relations* (pp. 39-101). Hillsdale, NJ: Erlbaum.
- CAPRARA, G. V., & CERVONE D.(2000). *Personality Determinants, Dynamics, and Potentials*. Cambridge University Press.
- CASPI, A. (2000). The child is father of the man: personality continuities from childhood to adulthood. *Journal of Personality and Social Psychology*, 78, 158-172.
- CASPI, A., BEM, D., & ELDER, G. H. JR. (1989). Continuities and consequences of interactional styles across the life course. *Journal of personality*, 57, 375-406.
- CATTELL, R.B., EBER, H.W., & TATSUOKA, M.M. (1977). *Handbook for the 16 personality factor questionnaire*. Champaign: IL, IPAT.
- CATTEL, R.B. (1946). *Description and measurement of personality*. London: George Harrap.
- CARVER, CH. S., & SCHEIER, M. F.(1998). *Személyiségpszichológia. [Perspectives on Personality]*. Budapest: Osiris.
- CASPI, A., & SILVA, P.A. (1995). Temperament qualities at age 3 predict personality traits in young adulthood: Longitudinal evidence from a birth cohort. *Child Development*, 66, 486-498.
- CASPI, A., BEM, D., & ELDER, G.H.JR. (1989). Continuities and consequences of interactional styles across the life of course. *Journal of Personality*, 57, 375-406.
- COSTA, P. T., JR., & MCCRAE, R. R.(1977). Age differences in personality structure revisited: studies in validity, stability and change. *Aging and Human Development*, 8, 261-275.
- COSTA, P. T., JR., & MCCRAE, R. R. (1992). Four ways five factors are basic. *Personality and Individual Differences*, 13, 653-665.
- COSTA, P. T., JR., MCCRAE, R. R., & ARENBERG, D. (1980): Enduring disposition in adult males. *Journal of Personality and Social Psychology*, 38, 793-800.
- EYSENCK, H. J. (1993). Creativity and personality: A theoretical perspective. *Psychological Inquiry*, 4, 147-178.
- EYSENCK, S. B. G., BARRETT, P. T., & BARNES, G. E. (1993). A cross-cultural study of personality: Canada and England children. *Personality and Individual Differences*, 14, 1-10.
- EYSENCK, H. J., & EYSENCK, S. B. G. (1969). *Personality structure and measurement*. London: Routledge & Kegan Paul.
- EYSENCK H. J., & EYSENCK, S. B. G. (1982). Recent advances in the cross-cultural study of personality. In C.D. Spielberger, & J.N. Butcher (Eds.), *Advances in personality assessment*. Hillsdale, NJ: Erlbaum.
- EYSENCK, H. J., & EYSENCK, S. B. G. (1991). *The Eysenck Personality Questionnaire-Revised*. Sevenoaks, Kent: Hodder and Stoughton.

- EYSENCK S.B.G., KÁLMÁLNCHÉY, M., & KOZEKI B. (1981). Magyar és angol iskoláskorú gyermekek összehasonlító vizsgálata: a Junior Eysenck Personality Questionnaire magyar változata. A comparative study of British and Hungarian children. *Pszichológia*, 2, 213-243.
- EYSENCK, S. B. G., KOZEKI B., & KÁLMÁLNCHÉY M. (1980). Cross-cultural Comparison of Personality: Hungarian Children and English Children, *Personality and Individual Differences*, 1, 347-353.
- EYSENCK, S. B. G., MAKAREMI, A., & BARRETT, P.T. (1994). A cross-cultural study of personality: Iranian and English children. *Personality and Individual Differences*, 16, 203-216.
- GRUBER, H. E. (1989). The evolving systems approach to creative work. In D. B. Wallace, & H. E. Gurber (Eds.), *Creative people at work: Twelve cognitive case studies* (pp. 3-24). New York: Oxford University Press.
- GUILFORD, J. P., & HOEPFNER, R., (1965). Current summary of structure-of- intellect factors and suggested tests. *Reports of the Psychological Laboratory*, No. 30. Los Angeles: University of Southern California.
- HAAN, N., MILLSAP, R., & HARTKA, E. (1986). As time goes by: Change and stability in personality over fifty years. *Psychology and Aging*, 1, 220-232.
- HELMKE A. (1988). The role of classroom context factors for the achievement-impairing effect of test. *Anxiety Research*, 1, 37-52.
- HELMKE, A., & WEINERT, F.E. (1996). Bedingungsfaktoren schulischer Leistungen [Determinants of Scholastic achievement]. In F. E. Weinert (Ed.), *Enzyklopädie der Psychologie*, Band 3 (Psychologie der Schule und des Unterrichts) (pp. 71-176.) Göttingen: Hogrefe.
- HELMKE, A., & WEINERT, F.E. (1999). Schooling and the development of achievement differences. In Weinert, F.E., & Schneider W.(Eds.), *Individual development from 3 to 12* (pp. 176-192). Cambridge: University Press.
- KOZEKI B., & EYSENCK S. B. G. (1985). Magyar és angol iskoláskorúak összehasonlító vizsgálata az impulzivitás – kockázatvállalás – empátia kérdőív magyar változata. [The comparative study of Hungarian and British pupils. The Hungarian versions of the impulsivity – venturesomeness – empathy questionnaire] *Pszichológia*, 4, 579-601.
- MAGNUSSON, D., & BACKTEMAN, G.(1978). Longitudinal stability of person characteristics: Intelligence and creativity. *Applied Psychological Measurement*, 2, 481-490.
- MAGNUSSON, D. (1998). The logic and implications of a person approach. In R.B. Cairns, L.R.Bergman, & J. Kagan (Eds.), *The individual as a focus in developmental research* (pp. 33-64). New York: Sage.
- MATTHEWS, G., & DEARY, I. J. (1998). *Personality Traits*. Cambridge University Press.
- MAXWELL, S. E., & DELANEY, H. D. (1990). Designing experiments and analysing data. A model comparison perspective. Belmont, California: Wadsworth Publishing Company.
- MCCRAE, R. R., & COSTA, P. T. (1996). Toward a new generation of personality theories: theoretical contexts for five-factor model. In J. S. Wiggins (Ed.), *The five-factor model of personality. Theoretical perspectives* (pp. 51-87). New York: Guilford.
- MCCRAE, R. R., & COSTA, P. T. (1999). A five-factor theory of personality. In L. A. Pervin, & O. P. John (Eds.), *Handbook of personality: Theory and research* (2nd ed.: pp. 139-153). New York: Guilford.
- MUELLER, J. H. (1992). Anxiety and performance. In A. P. Smith, & D. M. Jones (Eds.), *Handbook of human performance*, vol. 3. *State and trait*. London: Academic.
- NORMAN, R. W.(1963). Toward an adequate taxonomy of personality attributes: Replicated factor structure in peer nomination personality ratings. *Journal of Abnormal and Social Psychology*, 66, 574-583.
- ROTHBART, M. K. (1989). Biological processes in temperament. Temperament in childhood. In G. A.Kohnstamm, J. E. Bates, & M. K. Rothbart (Eds.), *Temperament in childhood* (pp.77-110), Chichester, UK: Wiley.
- ROTHBART, M. K., & BATES, J. (1998). Temperament. In W. Damon (Series Ed.), & N. Eisenberg (Vol. Ed.), *Handbook of child psychology* (5th edition) Vol. 3: *Social emotional, and personality development*, (pp. 105-176). New York: Wiley.
- ROTHBART, M. K., AHADI, S. A., & HERSHEY, K. L. (1994). Temperament and social behavior in childhood. *Merrill-Palmer Quarterly*, 40, 21-39.
- RUNCO, M. A., & ALBERT, R. S. (1985). The reliability and validity of ideational originality in the divergent thinking of academically gifted and nongifted children. *Educational and Psychological Measurement*, 45, 483-501.
- SIPOS K, SIPOS, M., & SPIELBERGER, C. D.(1988/a). A Test Anxiety Inventory (TAI) általános iskolások

- vizsgálatára kidolgozott magyar változata [The Hungarian adaptation of Test Anxiety Inventory(TAI) developed for primary school children] In Mérei F.-Szakács F. (Eds.), *Pszichodiagnosztikai Vadenecum* (pp. 136-149.). Budapest: Tankönyvkiadó.
- SIPOS K, SIPOS, M., & SPIELBERGER, C. D. (1988/b). State-Trait Anxiety Inventory. (STAI) magyar változata. [Hungarian version of State-Trait Anxiety Inventory. (STAI)] In Mérei F. – Szakács F. (Eds.), *Pszichodiagnosztikai Vadenecum* (pp. 123-136.). Budapest. Tankönyvkiadó.
- SNOW, R. E. (1989). Aptitude-treatment interaction as a framework of research in individual differences in learning. In P. L. Ackerman, R. J. Sternberg, & R. Glaser (Eds.), *Learning and individual differences* (pp. 11-34). New York: Freeman.
- SNOW, R. E. (1992). Aptitude theory: Yesterday, today and tomorrow. *Education Psychologist*, 27, 5-32.
- SPIELBERGER, C. D. (1966). The effects of anxiety on complex learning and academic achievement. In C. D. Spielberger (Ed.), *Anxiety and behavior* (pp. 3-20). London: Academic Press.
- STERNBERG R. J. (Ed.). (1999). *Handbook of Creativity*. Cambridge University Press.
- STERNBERG R. J., & LUBART, T. I. (1995). *Defying the crowd: Cultivating creativity in a culture of conformity*. New York: Free Press.
- STERNBERG R. J., & LUBART T. I. (1999). The Concept of Creativity: Prospects and Paradigms. In Sternberg, R. J. (Ed.), *Handbook of Creativity* (pp. 3-16). Cambridge University Press.
- TORRANCE, E. P. (1974). *Torrance Tests of Creative Thinking: Norms-technical manual*. Lexington, MA: Ginn.
- VARGHA, A., & CZIGLER, B. (1999). *A MiniStat statisztikai programcsomag, 3.2 verzió. [The MiniStat Statistical Program Package, version 3.2]* Budapest: Pólya Kiadó.
- WILCOX, R. R. (1996). *Statistics for the social sciences*. San Diego, New York: Academic Press.
- WINER, B. J. (1971). *Statistical principles in experimental design* (2nd ed.) Tokyo: McGraw-Hill Kogakusha.
- ZEIDNER, M. (1995): Personality trait correlates of intelligence. In Saklofske, D. H., & Zeidner, M.(Eds.), *International handbook of personality and intelligence* (pp. 299-319). New York: Plenum.
- ZÉTÉNYI T. (1989). *Kreativitás tesztek kézikönyve. [Handbook of creativity tests]*. Budapest: Munkaügyi Kutatóintézet.
- ZUCKERMAN, M. (1976). General and situation-specific traits and states: new approaches to assessment of anxiety and other constructs. In M. Zuckerman, & C. D. Spielberger (Eds.), *Emotions and anxiety: new concepts, methods and applications* (pp.133-174). Hillsdale, NJ: Erlbaum.

Received: January 2001
Accepted: May 2001