Age Differences in Temperament, Character and Depressive Mood: A Cross-Sectional Study

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Introduction: This study explores the effect of age on mean-levels of the personality traits defined in Cloninger’s personality taxonomy, and investigates the relevance of personality traits for predicting depression levels in adults aged 18 to 94 years. Method: We divided our sample (466 participants) into four age groups (young adult, adult, mature adult and elderly). Personality was measured using the Temperament and Character Inventory, and depression was assessed using the Hospital Anxiety and Depression Scale. Results: Analysis of variance showed mean-level changes for all the personality traits except Self-D. Post hoc analyses revealed a decrease in the level of novelty seeking with age and an increase in the level of self-transcendence for the two oldest age groups. Reward dependence was highest among the youngest participants, whereas harm avoidance was highest for both the youngest and the oldest age groups. Depression correlated positively with harm avoidance and age but negatively with self-transcendence. Discussion: Impulsiveness, curiosity and social dependency decrease with age, whereas spirituality increases. Young and elderly adults are more fearful and socially inhibited. Harm avoidance and self-transcendence are the most relevant personality traits for predicting levels of depression. Copyright © 2008 John Wiley & Sons, Ltd.

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INTRODUCTION

Personality is usually defined as one of the most stable psychological characteristics, an assumption that has led to a long-running controversy over whether personality traits change over lifespan (Caspi, Roberts, & Shiner, 2005). Costa et al. (2000) reported only few changes in personality profile after 30 years old, while Roberts, Walton, & Viechebauer (2006) observed changes in personality dimension until old age. This controversy could be partly addressed when we have phenotypic measures of personality that give reliable indices of hypothetical latent traits, as it is essential to distinguish true change from simple measurement error (Watson, 2004). Furthermore, assessing patterns of continuity and change requires the application of specific methods and statistical tools, such as longitudinal and cross-sectional studies, rank-order stability and mean-level change, multivariate methods, and latent growth curve models, etc. (Nesselroade & Boker, 1997).

A considerable amount of research has been carried out using the Big-Five traits (neuroticism, extraversion, openness to experience, agreeableness and conscientiousness) (Costa & McCrae, 1985) to examine the stability of personality over lifespan. McCrae and Costa (1994) suggested that personality traits stop evolving at around age 30; however, this view has been strongly challenged by more recent reports (Caspì et al., 2005). Personality is supposed to evolve in old age as elders tend to
develop more warmth in social relationships and exhibit an improvement in self-control (Mroczek & Spiro, 2003; for a review, see Trzesniewski, Robins, Roberts, & Caspi, 2004). Old people become more socially dominant, conscientious and emotionally stable. They also show a decrease in social vitality (as a facet of extraversion) and openness to experience (Roberts et al., 2006).

Previous studies additionally show the value of personality as a factor in depression in later part of life. Oldéhinkel, Bouhuys, Brilman, and Ormel (2001) argue that elders with a low score in neuroticism rate would exhibit a low depression level, and De Beurs et al. (2005) report that a high level in neuroticism trait is associated with an increase in late-life depression. It is although argued that neuroticism represents only a risk factor for depression in the latter part of life as late-life depression would rise from an interaction between neuroticism and congruent life events (Morse & Robins, 2005).

In contrast, few developmental studies are based on Cloninger, Svrakic and Przybeck’s personality model (1993), which is a psychobiological model of temperament and character, in which temperament is generated by genetic and neurobiological factors. According to Cloninger et al., temperament has four dimensions: novelty seeking (NS) reinforces active approach behaviours with respect to novelty; harm avoidance (HA) is associated with the avoidance of aversive stimuli; reward dependence (RD) is related to the tendency to maintain behaviours in familiar situations or when rewards are expected; and persistence (P) leads to maintaining a behaviour whatever its consequences. These temperament dimensions are considered the most heritable personality traits and are considered stable throughout life.

Cloninger’s character reflects ‘individual differences in self-object relationships’ (Cloninger, Bayon, & Svrakic, 1998), and it is assumed to be less stable over time. Character can be divided into three dimensions: Self-D (SD) refers to self-acceptance; responsibility; cooperativeness (C) refers to the ability to identify with and accept other people; and self-transcendence (ST) describes the tendency to feel part of nature and the universe.

Our study aims to explore changes with age in levels of these Cloninger’s personality dimensions. This work was motivated by two main goals. First, Cloninger’s dimensions have been related to Five Factors Model (FFM) ones (McCrae, Costa, Ostendorf, Angleitner, Hrebickova, & Avia, 2000), which enable us to test whether predictions from FFM reflects a natural phenomenon by attempting to replicate these results when using another but related personality model. Second, Cloninger’s model was developed to furnish one personality theory that is well adapted to realize psychiatric diagnosis (Cloninger et al., 1993; Svrakic et al., 1993). In a clinical purpose, our study could be informative to the extent that it would highlight whether personality dimensions remain or not associated with psychological distress throughout lifespan, which is tapped here using depression scores.

According to Cloninger’s psychobiological model of personality, temperament is stable throughout life, whereas character is considered less stable over time. Thus, we hypothesized that the character dimensions of the Temperament and Character Inventory (TCI) would demonstrate more mean-level differences than the temperament dimensions of the TCI. Changes in the character dimensions are thought to reflect and result from psychological maturity and socio-cultural development.

Finally, we expected the importance of personality as a correlate of depressive mood to decrease with age; this may be due to the preponderance of physical health concerns and social support influences in older persons (Naarding et al., 2005; Prince, Harwood, Blizard, Thomas, & Mann, 1997).

METHOD

Participants

The cross-sectional method was used to design four independent experimental groups. Our study was based on 466 community-lived people (161 male and 305 female), who were divided into four age groups, called Groups 1 to 4, from the youngest to the oldest (mean age = 46.56 years; Standard Deviation [SD] = 20.15). The level of education is about 10 years (SD = 0.56). None of them reported any previous psychiatric troubles or diagnoses of neurodegenerative diseases. Groups of age boundaries were determined according to literature data about personality changes with age. The 30-year-old limit (Group 1) is supported by the assumption that most of the personality changes would occur before this age (McCrae & Costa 1994). Group 2 and Group 3 limits were based on the assumption that inter-individual differences would gradually increase for all personality traits until 50–70 years old (Roberts & DelVecchio, 2000; Small et al., 2003). The fourth and last group was designed to explore...
the still few documented destiny of personality after 70 years old.

Group 1 (n = 24) comprised subjects from 18 to 30 years old (mean = 19.73 years; SD = 2.31), of whom 95% were female. Group 2 (n = 154) comprised subjects from 31 to 49 years old (mean = 45.07 years; SD = 3.09), of whom 58% were female. Group 3 (n = 113) comprised subjects from 50 to 69 years old (mean = 56.35 years; SD = 6.11), of whom 39% were female. Group 4 (n = 75) comprised subjects from 70 to 94 years old (mean = 79.19 years; SD = 5.43), of whom 65% were female. Analysis of variance (ANOVA) results confirmed the significance of the inter-group age differences (F[dll = 3] = 3270, 52; p < 0.001). These groups’ demographic characteristics are summarized in the Table 1.

All our subjects were recruited from community home residents. The youngest subjects were recruited from a population of French students. Adults and elders were recruited by students among their relatives and neighbours and met the inclusion criteria. Adults, except students, were employees, and oldest persons attend activities of a club of retired people. Questionnaires were handled and distributed by students and filled out at home.

**Table 1. Samples demographic characteristics**

<table>
<thead>
<tr>
<th></th>
<th>Group 1 (n = 124)</th>
<th>Group 2 (n = 154)</th>
<th>Group 3 (n = 113)</th>
<th>Group 4 (n = 75)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age</td>
<td>19.73 (±2.31)</td>
<td>45.07 (±3.09)</td>
<td>56.35 (±6.11)</td>
<td>79.19 (±5.43)</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>5 %</td>
<td>42 %</td>
<td>61 %</td>
<td>35 %</td>
</tr>
<tr>
<td>Female</td>
<td>95 %</td>
<td>58 %</td>
<td>39 %</td>
<td>65 %</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>86 %</td>
<td>40 %</td>
<td>36 %</td>
<td>61 %</td>
</tr>
<tr>
<td>Married</td>
<td>0 %</td>
<td>51 %</td>
<td>61 %</td>
<td>32 %</td>
</tr>
<tr>
<td>Concubinage</td>
<td>14 %</td>
<td>9 %</td>
<td>3 %</td>
<td>7 %</td>
</tr>
</tbody>
</table>

**Measures**

**Personality**

The French version of the TCI self-questionnaire (Cloninger, Przybeck, Svrakic, & Wetzel, 1994) was validated by Pélissolo and Lépine (1997). It consists of 226 true/false propositions and seven scales rating the seven dimensions described in Cloninger et al. (1993) psychobiological model of personality: NS (40 items), HA (35 items), RD (24 items), P (8 items), SD (44 items), C (42 items) and ST (33 items). Each temperament and character dimension is further divided into between 1 and 5 subscales. Pélissolo and Lépine (2000) also carried out a normative data and validation study for the French version of the questionnaire, reporting a seven-factor structure (absolute value ≥ 0.40) that was congruent with the original English version (Cloninger et al., 1993; Cloninger et al., 1994). Moreover, their sample internal consistency values were satisfactory for all the personality scales (Cronbach α ≥ 0.68), except for the P scale (Cronbach α = 0.49).

**Depressive Mood**

We used the depression subscale score of the Hospital Anxiety and Depression Scale (HADS) as an indicator of depressive mood. Originally developed by Zigmond and Snaith (1983), the HADS comprises 14 propositions and a three-degree response scale scored from 0 to 2. The HADS is split into two subscales, with seven items reflecting depressive mood and seven additional items reflecting anxiety level. This two-factor solution has also been reported for many different language versions of the HADS (Herrero et al. 2003; Montazeri, Vahdaninia, Ebrahimi, & Jarvandi, 2003; Spinhoven et al. 1997). Nevertheless, the distinction between the depression and anxiety subscales remains doubtful for the French version of the HADS. The first validation study for the French version emphasized that it is difficult to clearly distinguish between the depression and anxiety subscales. Consequently, the authors argued that it would be much better to calculate a single psychological-distress score from the HADS items (Razavi, Delvaux, Farvacques, & Robaye, 1989). A number of more recent studies have highlighted the validity of several three-factor solutions. For example, the use of exploratory factor analysis led Fried-
man, Samuelian, Lancrenon, Even and Chiarelli (2001) to define the following subscales (loading criterion ≥0.39): 1—depression, 2—psychic anxiety and 3—psychomotor agitation. On the other hand, Caci et al. (2003) found that applying confirmatory factorial analysis (CFA) revealed a different three-factor structure of the HADS, in which depression level is more properly tapped by items 2, 4, 6, 8 and 12. In our study, we summed these last five items to rate depressive mood. We chose Caci et al.’s factorial structure as it lays on the structural equation modelling, which is most robust than the principal component factorial analysis performed by Friedman et al.

Procedure
The questionnaires were first given to the students, who then distributed a copy to an older relative or neighbour. The first page of the questionnaire described the main objectives of our research, in order to ensure participants could give free and informed assent to participate in the study. The subsequent pages presented the TCI personality self-questionnaire and a full version of the HADS self-assessment.

Statistical Analyses
All analyses were carried out with Statistica software, version 6.0, Maisons-Alfort, France. Comparisons of more than two groups were performed using one-single factor ANOVA formula; two-group comparisons were performed using Bonferroni’s post hoc tests. To determine the effect of personality dimensions on depressive mood, regression models were tested using Lisrel 8 software, Chicago, IL, USA.

RESULTS
Mean-level Differences in TCI Dimensions and Depressive Mood
Comparisons were conducted between age groups. First, eight separate univariate ANOVAs were computed to determine age-group differences on the TCI and HADS. Second, Bonferroni’s post hoc tests (p < 0.05) were calculated to determine which groups were significantly different from others.

Table 2 presents the means and SDs of the TCI and HADS by age group. All four of the temperament dimensions and two of the three character dimensions showed significant age-group differ-

<table>
<thead>
<tr>
<th>Group 1 (n = 124) (18–30 years)</th>
<th>Group 2 (n = 154) (31–49 years)</th>
<th>Group 3 (n = 113) (50–69 years)</th>
<th>Group 4 (n = 75) (70–94 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Mean ± SD</td>
<td>Overall Mean ± SD</td>
<td>Overall Mean ± SD</td>
<td>Overall Mean ± SD</td>
</tr>
<tr>
<td>Depression:</td>
<td>Personality:</td>
<td>Character:</td>
<td></td>
</tr>
<tr>
<td>2.40 ± 1.54</td>
<td>2.87 ± 1.59</td>
<td>2.63 ± 1.36</td>
<td>2.95 ± 1.53</td>
</tr>
<tr>
<td>Mean effect</td>
<td>Mean effect</td>
<td>Mean effect</td>
<td>Mean effect</td>
</tr>
<tr>
<td>p value</td>
<td>0.03</td>
<td>0.0001</td>
<td>0.0001</td>
</tr>
<tr>
<td>df</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>f</td>
<td>2.96</td>
<td>2.96</td>
<td>2.96</td>
</tr>
</tbody>
</table>

df = degree of freedom, n.s. = not significant, ANOVA = analysis of variance, NS = novelty seeking, HA = harm avoidance, RD = reward dependence, P = persistence, SD = self-directedness, C = cooperativeness, ST = self-transcendence.
ences; hence, the only dimension that did not reveal any age-group differences was SD. The following paragraphs present the results in greater detail.

For the temperament dimensions, significant age-group differences were found for the NS scores ($F[3] = 28.34; p = 0.0001$). Post hoc tests revealed that the 18- to 30-year-old subjects (Group 1) recorded higher NS scores (mean = 21.63; ±5.88) than the 31- to 49-year-old (Group 2) (mean = 17.88; ±5.30) ($p = 0.0001$), 50- to 69-year-old (Group 3) (mean = 16.04; ±5.37) ($p = 0.0001$) and 70- to 94-year-old subjects (Group 4) (mean = 15.57; ±4.46) ($p = 0.0001$). Similarly, Group 2 recorded higher NS levels than Groups 3 ($p = 0.006$) and 4 ($p = 0.003$). There were no significant age differences in mean NS levels between Groups 3 and 4. Our results indicated globally significant age differences in the HA scores ($F[3] = 5.53; p = 0.001$). More precisely, the mean score for Group 1 (mean = 19.54; ±6.46) was significantly higher than the mean scores for Groups 2 (mean = 17.26; ±7.19) ($p = 0.006$) and 3 (mean = 17.10; ±6.40) ($p = 0.006$). Group 2 scores did not significantly differ from Group 3 scores, but they were significantly lower than Group 4 scores ($p = 0.003$). Moreover, the mean HA score for Group 3 was significantly lower than the mean score for Group 4 ($p = 0.003$). There were also significant age-group differences in the RD scores ($F[3] = 13.78; p = 0.0001$). Post hoc comparisons indicated that Group 1 subjects (mean = 17.30; ±3.61) recorded significantly higher RD scores than Group 2 (mean = 14.67; ±3.94) ($p = 0.0001$), Group 3 (mean = 14.88; ±3.42) ($p = 0.0001$) and Group 4 (mean = 15.79; ±3.42) ($p = 0.03$) subjects. As noted above, the ANOVA indicated significant differences between the P scores for the age groups ($F[3] = 3.42; p = 0.02$). However, post hoc comparisons revealed only one significant age difference: Group 1 scores were significantly lower than Group 3 scores ($p = 0.002$) (Table 3).

The results for the TCI character dimensions did not indicate either globally significant age-group differences in the SD scores ($F[3] = 1.75; p = n.s.$) or any significant post hoc differences. However, there were significant age-group differences in the C scores ($F[3] = 5.47; p = 0.001$), with the post hoc comparisons revealing significantly higher scores for Group 1 subjects (mean = 33.99; ±4.60) than for Group 2 (mean = 31.77; ±3.94) ($p = 0.003$) and Group 3 subjects (mean = 31.60; ±5.08) ($p = 0.001$). Finally, our results revealed significant differences between the ST scores of the different age groups. ($F[3] = 17.29; p = 0.0001$). Post hoc tests revealed that Group 4 subjects (mean = 18.93; ±6.09) had significantly higher ST scores than Group 1 (mean

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Group 1 vs. Group 2</th>
<th>Group 1 vs. Group 3</th>
<th>Group 1 vs. Group 4</th>
<th>Group 2 vs. Group 3</th>
<th>Group 2 vs. Group 4</th>
<th>Group 3 vs. Group 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>p = 0.01</td>
<td>p = 0.001</td>
<td>p = 0.006</td>
<td>p = 0.002</td>
<td>p = 0.001</td>
<td>p = 0.001</td>
</tr>
<tr>
<td>Personality</td>
<td>n.s.</td>
<td>p = 0.006</td>
<td>p = 0.001</td>
<td>p = 0.002</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td>Temperament</td>
<td>n.s.</td>
<td>p = 0.006</td>
<td>p = 0.001</td>
<td>n.s.</td>
<td>p = 0.001</td>
<td>p = 0.001</td>
</tr>
<tr>
<td>NS</td>
<td>p = 0.001</td>
<td>p = 0.006</td>
<td>p = 0.001</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td>HA</td>
<td>p = 0.003</td>
<td>p = 0.006</td>
<td>p = 0.001</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td>RD</td>
<td>p = 0.006</td>
<td>p = 0.003</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
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<tr>
<td>P</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td>Character</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td>C</td>
<td>p = 0.006</td>
<td>p = 0.006</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td>ST</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
</tbody>
</table>

NS = not significant, NS = novelty seeking, HA = harm avoidance, RD = reward dependence, P = persistence, SD = self-transcendence, C = cooperativeness, ST = self-transcendence.
and negatively predicted by ST (p < 0.01). Group 2 (mean = 13.14; ±6.25) (p = 0.0001) and Group 3 subjects (mean = 15.36; ±6.85) (p = 0.0001). In addition, Group 3 subjects scored higher than Group 2 subjects (p = 0.004). There were no differences between Group 1 and Group 2 subjects or between Group 1 and Group 3 subjects.

For depressive mood, our results showed significant age-group differences (F[3] = 2.96; p = 0.03). Post hoc comparisons revealed that Group 1 subjects (mean = 2.40; ±1.54) scored lower than Group 2 (mean = 2.87; ±1.59) (p = 0.01) and Group 4 subjects (mean = 2.95; ±1.53) (p = 0.01) subjects.

### Multiple Regression Analyses

Five regression models were tested using Lisrel 8 software (Jöreskog & Sörbom, 1993), to determine the extent to which the TCI dimensions predict depressive mood. These models included the TCI dimensions as well as age and gender. These independent variables were allowed to be correlated. The first model analysed all the participants’ scores (N = 466). The four other models analysed each age group’s scores separately. The results are summarized in Table 4.

The model analysing all the participants’ scores indicated that depressive mood was positively predicted by HA (0.30, p < 0.05) and age (0.12, p < 0.05) and negatively predicted by ST (−0.13, p < 0.05). R² was equal to 0.17. In the 18–30 age group, depressive mood was positively predicted by HA (0.37; p < 0.01). R² was equal to 0.27. In the 31–49 age group, depressive mood was predicted by HA (0.31, p < 0.01) and gender (0.19, p < 0.05), with women exhibiting a higher level of depressive mood than men. R² was equal to 0.27. In Group 3 (50–79 years old), depressive mood was positively predicted by HA (0.37, p < 0.01) and negatively predicted by ST (−0.26, p < 0.01). R² was equal to 0.28. Finally, none of the TCI dimensions predicted depressive mood for the 70–94 age group (Group 4).

### DISCUSSION

The present study was designed to examine mean-level differences in personality traits as assessed by Cloninger’s TCI. A cross-sectional design was used to study four groups at different stages of development: young adult (18–30 years old), adult (31–49 years old), mature adult (50–69 years old) and elderly (70–94 years old). It was also designed to explore the relation between the temperament and character dimensions and depression for each age group.

Our results show a substantial decrease in NS with increasing age, suggesting that younger people are more likely to be excitable, easily bored, impulsive, curious, extravagant and quick-tempered than older people. The main adaptive advantages of high NS are a willingness to explore novel and unfamiliar stimuli, which may lead to new discoveries. The decrease in NS with age means that older people are more likely to be even-tempered, less curious, reflective, temperate, reserved, tolerant of monotony, stoical and

![Table 4. Estimated regression coefficients (standardized) of the specified model for the whole sample and for each age group](https://example.com/table4.png)
orderly. NS is thought to be moderately heritable and moderately stable throughout life. Benjamin et al. (1996) and Ebstein et al. (1996) reported a link between a gene on chromosome 11 (D4DR exon III sequence variants) and the NS trait. This gene regulates dopamine activity. However, age-group differences may reflect developmental tasks and the psychological maturation of social behaviours connected with avoiding frustration and responses to novelty, impulsiveness and extravagance. It is socially and culturally evident that the youngest people would report the highest mean NS values. It should be noted here that there is no difference between the two oldest groups (50–69 years old and 70–94 years old). Thus, the decrease in NS seems to stabilize at around age 50 to 69.

The highest scores for HA were recorded for the youngest and the oldest subjects, which means that young and elderly adults are more likely to be fearful, passive, shy, socially inhibited, easily tired and pessimistic than other adults. Thus, adults aged between 30 and 69 tend to be more courageous, energetic and optimistic than younger or older people. Developmental tasks, such as performing satisfactorily in one’s career, parenting and grand-parenting, may explain the low HA scores obtained in middle adulthood. Coping with physical changes, adjusting to decreasing physical strength and deteriorating health, and fear of death may explain the HA high scores obtained by elderly adults.

The younger adults had higher RD scores than the other groups, indicating that younger adults are more likely to be sensitive, tender-hearted, sociable and socially dependent than older adults. It would seem normal for people in early adulthood to be dependent on approval by others. Some developmental tasks, such as selecting a mate, getting started in an occupation and a need to achieve, may explain young adults’ high RD scores. These scores appear to be stable from middle adulthood until very old age.

For the P dimension, which covers perfectionism, ambition, industriousness and determination, there are very few differences between the age groups.

The differences between age groups that are observed for the temperament dimensions suggest that changes of personality traits with age traits may be governed by genetic factors as well as by environmental influences and personal experiences. According to Baltes, Lindenberger, and Staudinger (1998), there is a dialectic between consistency and change over the life course. Thus, psychological adjustment—via selection, optimization and compensation processes—is the main focus of development.

In terms of the character dimensions, there were no age-related differences for SD, which relates to responsibility, realism, resourcefulness and self-confidence. This finding is intriguing: character is assumed to be pervious to environmental influences; therefore, we predicted that people would become more self-directed as they become older. In fact, they become less realistic and goal-oriented.

The C scores for the youngest adults were higher than those for older adults but not for the oldest people. This means that younger people are more likely to be tolerant, empathic, principled, compassionate and supportive than older adults. Again, this finding is interesting because we expected C to increase with age, as C relates to the extent to which individuals conceive themselves as integral parts of human society. Thus, some developmental tasks, such as parenting, assisting children to become responsible and happy citizens, and achieving adult social and civic responsibilities, may affect changes in C with age.

A marked increase in ST from the youngest to the oldest subjects was noted, showing that people become more spiritual, unpretentious, humble and fulfilled as they grow older. This finding conforms to our expectation but differs from previous research, which has indicated that there is no link between ST and age (Cloninger et al., 1993; Coleman et al., 1999). In fact, our results are supported by many other pieces of evidence, notably the fact that ST is an important step towards the development of wisdom—defined by Birren and Fisher (1990) as the integration of affective, cognitive and conative aspects of human abilities in response to life tasks and problems. Furthermore, spiritual beliefs are thought to enable people to make sense of negative age-related experiences, and to provide hope and a sense of control when faced with medical problems or disabilities in later life (Koenig, 2004).

Finally, HA is correlated with depressive mood in younger and older adults, but not in the elderly. HA has been consistently shown to correlate positively with depressive mood, both in clinical settings (Hansen et al., 1999; Richter, Eisemann, & Richter, 2000) and in the general population (Richter, Polak, & Eisenmann, 2003). This is unsurprising, as HA people tend to be cautious, careful, fearful, apprehensive, tense, nervous, timid, doubtful, easily discouraged, insecure, passive, negative and pessimistic. However, in the oldest group...
(70–94 years old), neither temperament nor character can explain depressive mood. This finding is consistent with our expectations, but it is inconsistent with the recent results obtained by Steunenberg, Beekman, Deeg, and Kerkhof (2006), who reported a stronger relation between the onset of depression and personality (i.e. mastery and neuroticism) than between depression and physical health and social resources in later life. Steunenberg et al. (2006) concluded that even in old age personality remains an important predictor for the onset of depression and that it is not affected by other predictors or age effects.

Finally, we found a negative link between ST and depression in the mature adults group. This result reinforces the above-stated assumption concerning the adaptive value of spiritual beliefs as age increases. However, the buffering effect of spirituality seems to decrease in very old age, as we did not find a link between ST and depression for the 70- to 94-year-old subjects.

We must stress that this study has a number of limitations. First, to the best of our knowledge, this is the first attempt to describe changes in the temperament and character of adults aged 18 to 94 years, and to investigate the links between temperament and character and depressive mood across lifespan. Thus, both the course of personality changes and their link with depression must be confirmed. Our research also has clinical limitations. For instance, we selected depression as one adaptation quality indicator, as it is usually assumed to reflect the quality of interactions between personality and life events (Morse & Robins, 2005). To assess depressive mood, we used one self-rated questionnaire consisting of items that reflect the most common depression symptoms. However, the study of depressive syndrome in the elderly involves additional diagnostic criteria (i.e., signs of hypochondria, mental confusion) that were not assessed in our study (Fremont, 2004). Hence, it remains to be shown whether we can observe links between personality dimensions and these signs of late-life depression. Additionally, we adopted the cross-sectional method, which suffers from several limitations. It consists of one single measurement carried out at one time point and gives no indication of the sequence of events. Cross-sectional methods enable us to interpret the inter-group differences concerning personality dimension as reflecting the effect of age, but we cannot interpret our results as reflecting a developmental process. The last point remains to address Cloninger’s personality model and should ground future studies adopting a longitudinal design. Moreover, our results must be cautiously interpreted as many other uncontrolled sources of variance than age could explain our results (generation effects). In cross-sectional studies, age effects and generation effects are confounded, which impairs the internal validity of cross-sectional studies (Baltes, 1968). Therefore, we cannot firmly ensure that age is the only variable to explain inter-group differences. To reinforce both the internal and the external validity of the results, future studies should address the developmental course of Cloninger’s personality dimensions by combining both cross-sectional and longitudinal designs. At least, we mainly included people with high education levels, which impairs the possibility of generalizing our results to the general population.

REFERENCES


