Personality and Defense Mechanisms in Late Adulthood
Yong Yu, Tomas Chamorro-Premuzic and Shuji Honjo

*J Aging Health* 2008 20: 526 originally published online 2 May 2008
DOI: 10.1177/0898264308317535

The online version of this article can be found at:
http://jah.sagepub.com/content/20/5/526
Personality and Defense Mechanisms in Late Adulthood

Yong Yu, MA  
*University of Nagoya, Japan*  
Tomas Chamorro-Premuzic, PhD  
*University of London*  
Shuji Honjo, MD, PhD  
*University of Nagoya, Japan*

**Objective:** Current understanding of the use of psychological defense mechanisms (DMs) in older adults is limited. This study set out to examine individual differences in DMs and Cloninger’s biosocial model of personality in two age groups (50–64, 65–93), as well as their influence on health. **Methods:** A Japanese community sample (*N* = 330) completed the Temperament and Character Inventory (TCI-125), the Defense Style Questionnaire (DSQ-40), and the General Health Questionnaire (GHQ-28). **Results:** Across age groups, psychological well-being was related to lower levels of harm avoidance and higher levels of self-directedness. In addition, older age was related to decreases in reward dependence, cooperativeness, and increases in self-transcendence, DMs of isolation, denial, and splitting. **Discussion:** An Age × Gender interaction revealed that men and women varied in their pattern of age differences for some specific DMs. Results further suggest that image-distortion defense may function to compensate resource loss.  

**Keywords:** personality; defense mechanisms; late adulthood

In recent years there has been increasing research into the question of whether personality is predominantly plastic, that is, changeable (e.g., Baltes, Staudinger, & Lindenberger, 1999; Helson, Jones, & Kwan, 2002; Helson, Kwan, John, & Jones, 2002; Helson & Soto, 2005; Roberts, Helson, & Klohn, 2002), or rigid, that is, stable, (McCrae et al., 2000) throughout the life span. However, the majority of these studies are based on trait taxonomy,
leaving other approaches to personality, namely, social-cognitive and psycho-
dynamic approaches (Funder, 2001) largely unexplored. It has been argued
that research on personality would benefit from the inclusion of defense
mechanisms (DMs; Skodol & Perry, 1993). From its original psychoana-
lytic notion as a mechanism that the ego implements to bar the expression
of certain instinctual impulses, the concept of DMs has been recently
approached from the perspective of neuroscience as a complex emotional-
cognitive constellation (Northoff & Boeker, 2006). Currently defined as
the “automatic psychological processes that protect the individual against
anxiety and from the awareness of internal or external dangers or stressors”
(Diagnostic and Statistical Manual of Mental Disorders [4th ed.]; American
Psychiatric Association, 1994, p. 751), DMs can be arranged on a continuum
of ego maturity from immature to mature (e.g., Bond, Gardner, Christian, &
Sigal, 1983; Vaillant, 1977; Vaillant, Bond, & Vaillant, 1986). Functioning
to maintain emotional homeostasis, DMs may play a crucial role in later
life because older adults tend to selectively focus greater on regulating
emotions (Carstensen, Mikels, & Mather, 2006). Thus far, age differences
revealed in coping (Blanchard-Fields, Stein, & Watson, 2004), everyday
problem solving (Marsiske & Margrett, 2006), and emotion-regulation
strategies (Labouvie-Vief & Medler, 2002) suggest potential modifications
in the employment of DMs in later life. However, data on defense use are
exceedingly scant to characterize defensive patterns of older people as more
or less adaptive (Costa, Zonderman, & McCrae, 1991). Hence, the present
cross-sectional study incorporates the constructs of traits and psychological
defense to examine their age and gender differences in late adulthood,
together with the existence and implications of Age × Gender interactions,
which have not received much attention thus far.

Age-Related Differences in Personality
and DMs in Late Adulthood

On one hand, personality shows certain relations to age even till late life.
Using the five-factor model (Digman, 1990), a growing body of evidence
suggests that although the structure of the Big Five (Neuroticism, Extraversion,
Openness to Experience, Agreeableness, and Conscientiousness) is largely
invariant throughout the life span (Costa & McCrae, 1994), individual trait
scores do vary with age. Specifically, Neuroticism decreases in adulthood
(Mroczek & Spiro, 2003) and shows a subsequent increase later in life
(Small, Hertzog, Hultsch, & Dixon, 2003; Steunenberg, Twisk, Beekman,
Deeg, & Kerkhof, 2005). Small declines have been found in Openness to
Experience and Extraversion (Field & Millsap, 1991), whereas Agreeableness and Conscientiousness have shown increases, albeit minor, throughout the life span (Helson, Jones, et al., 2002; Helson, Kwan, et al., 2002). Similar patterns of mean-level changes have been observed across different cultures (McCrae & Costa, 2006) and replicated with other instruments (e.g., California Psychological Inventory, see Helson et al., 2002; Labouvie-Vief, Diehl, Tarnowski, & Shen, 2000), emphasizing actual cohort differences (McCrae et al., 2000). With regard to the biosocial model of personality (Cloninger, 1986; Cloninger, Svrakic, & Przybeck, 1993), which encompasses four genetic (temperament) dimensions (novelty seeking, harm avoidance, reward dependence, and persistence) and three environmental (character) dimensions (self-directedness, cooperativeness, and self-transcendence), the literature revealed that novelty seeking is negatively associated with age, whereas self-directedness and cooperativeness are positively associated with it (e.g., Cloninger, Przybeck, Svrakic, & Wetzel, 1994; Hansenne, Delhez, & Cloninger, 2005).

On the other hand, comprehensive and consistent patterns of DMs in later life have not been depicted. Early evidence suggested increases in the use of mature defense and corresponding decreases in the use of immature defense from adolescence to middle age (Vaillant, 1977), as well as subsequent stability (Vaillant et al., 1986). Recent studies reported no significant differences between middle age and older age (Watson & Sinha, 1998; Whitty, 2003). However, data from these studies are inadequate due to limitations such as small sample size ($n < 24$). Our knowledge on developmental patterns of DMs, compared with that of other psychological constructs, such as personality and intelligence, is insufficient. Thus, by investigating a larger sample, the present study may enhance our understandings of use of DMs in later life.

**Gender Differences in Personality and DMs**

Previous research has highlighted gender differences in both personality traits and the employment of DMs. In the biosocial model, it appears to be consistent that women score higher on harm avoidance, reward dependence, and cooperativeness than men (Gutierrez-Zotes et al., 2004; Hansenne et al., 2005; Pélissolo & Lépin, 2000), whereas results on self-directedness vary. With regard to defense, evidence indicated gender differences not only in defense use, that is, men using externalizing and women using internalizing defenses, but also in the implications of using the same defense (Cramer, 2006). Research specified that females tend to use more somatization, reaction
formation, pseudoaltruism, whereas males tend to use more suppression, projection, and isolation (Ruuttu et al., 2006; Watson & Sinha, 1998).

Despite the above-mentioned findings, little is known about whether similar gender differences endure till old age, and whether men and women take same developmental trajectories in defense use. We enquire into these questions by examining Age × Gender interactions of the two constructs, an issue that has not been thoroughly studied thus far.

**Personality, DMs, and Health**

Previous findings suggest that personality dispositions are stronger predictors of health and well-being in comparison with other demographic and contextual factors (Diener & Lucas, 1999). Ozer and Benet-Martínez (2006) argued that personality traits are associated with both causal and protective factors of disease as well as health-related coping behaviors. The link between personality and physical health, longevity, and subjective well-being has been broadly examined, and there is evidence indicating that a high level of neuroticism is directly associated with fatigue (Martin, Bishop, Poon, & Johnson, 2006), mortality (Wilson, de Leon, Bienias, Evans, & Bennett, 2004; Wilson et al., 2005), loneliness (Long & Martin, 2000), and depression (Cheung & Todd-Oldehaver, 2006) in old age. Closely associated with neuroticism, harm avoidance in the biosocial model of personality indicates a heritable bias for inhibition and cessation of behaviors (Cloninger et al., 1994). High level of harm avoidance is proven to be a risk factor of anxiety and depression (Farmer et al., 2003; Matsudaira & Kitamura, 2006), and therefore, is expected to relate to poor health and psychological well-being in older adults.

With respect to DMs, cross-sectional evidence indicates correlations between adaptiveness of defense styles and mental health (see Bond, 2004, for a recent review), whereas longitudinal findings clarified association between risk of alcohol dependence, major depression, and immature defense as well as contribution of mature defense to a successful aging (Vaillant, 2002). Furthermore, evidence consistently indicates that women tend to report lower levels of subjective well-being compared with men (Pinquart & Sörensen, 2001). However, the association between such gender differences, as observed in DMs and in health, need further examination. Together with the need to integrate social and biological perspectives when considering gender differences in health (Rieker & Bird, 2005), an approach from the perspective of DMs and personality may as well benefit our understanding of the underlying psychological mechanisms of this issue.
For these reasons, this study examines age and gender differences in personality traits and the use of DMs as well as their influence on general health condition. In light of previous findings, the following hypotheses are stated.

1. There will be significant age-related differences in personality traits and DMs. Specifically, older adults will score higher in cooperativeness and mature DMs.
2. In comparison with men, women will score higher in harm avoidance, reward dependence, cooperativeness, and neurotic DMs. Women will also report lower levels of health than men.
3. General health condition will be predicted by both personality traits, particularly harm avoidance, and DMs, particularly immature DMs.

Method

Participants

Participants were 330 (163 women) community dwellers from an urban area of central Japan, whose age ranged from 50 to 93 years (M = 66.48, SD = 9.28). For the recruitment of participants, the authors directly contacted their acquaintances whose age exceeds 50 years, and asked companies or public facilities (such as care homes and libraries) for permission to conduct the survey. Attached with a written description of the purpose of the study, the questionnaires were handed to participants who voluntarily agreed to cooperate. Short versions of the measurements were adopted to avoid excessive workload for older participants. Replies with more than 10% missing data were excluded to ensure their accuracy and reliability. Among the valid answers, 47% of the participants were in employment and 75% were in cohabitation.

Instruments

Temperament and Character Inventory (TCI-125). Personality traits were assessed with the shortened, Japanese version of Cloninger’s TCI (Kijima et al., 1996), which is a 125-item, self-report, true–false questionnaire with five questions relating to each subscale (Cloninger et al., 1994). The TCI comprises four temperament dimensions: (a) novelty seeking, a measure of behavioral activation and excitement seeking that assesses exploratory excitability, impulsiveness, extravagance, and disorderliness; (b) harm avoidance, a measure of behavioral inhibition and fearfulness; it includes facets
of shyness, pessimism, worry, and fatigability; (c) reward dependence, a measure of social attachment that incorporates facets of sentimentality, warmth, and emotional attachment; and (d) persistence, which assesses eagerness, affinity for work, ambition, and perfectionism. The three character dimensions are (a) self-directedness, containing five subscales, namely, responsibility, purposefulness, resourcefulness, self-acceptance, and congruent second nature; (b) cooperativeness, measuring facets of social acceptance, empathy, helpfulness, compassion, and pureheartedness; and (c) self-transcendence, encompassing facets of self-forgetfulness, transpersonal identification, and spiritual acceptance. The validity and reliability of the Japanese TCI-125 have been verified (Kijima, Tanaka, Suzuki, Higuchi, & Kitamura, 2000). In this study, Cronbach’s alpha of the TCI ranged from .55 to .79 (refer to Table 1 for details).

**Defense Style Questionnaire (DSQ-40).** A Japanese adaptation of the DSQ-40 (Nakanishi, Shinotake, Ando, Kadowaki, & Ishii, 1998) was used. It consists of 40 items that assess 20 discrete DMs, ranging from immature to mature (Andrews, Singh, & Bond, 1993). Responses were computed on a 9-point Likert-type scale. Immature defense style includes projection, passive aggression, acting out, isolation, devaluation, autistic fantasy, denial, displacement, dissociation, splitting, rationalization, and somatization. Neurotic defense style includes undoing, pseudoaltruism, idealization, and reaction formation. Mature defense style includes sublimation, humor, anticipation, and suppression. The concurrent validity and test–retest reliability of this Japanese version have been confirmed (Hayashi, Miyake, & Minakawa, 2004). Internal consistency (Cronbach’s alpha) of the DSQ in this study was .57 for mature and neurotic defense styles and .75 for the immature style.

**General Health Questionnaire (GHQ-28).** The GHQ-28 is a broadly used indicator of psychological aspect of quality of life (Goldberg & Hillier, 1979). It was employed in the present study to assess current physical health and psychological well-being. The GHQ-28 measures four domains of psychiatric symptoms, namely, somatic symptoms, anxiety and insomnia, social dysfunction, and depression. Higher GHQ scores indicate more physical and mental symptoms and therefore, less favorable health. The GHQ has been translated into about 38 languages, with its validity and reliability being verified by over 50 psychometric studies (Goldberg & Williams, 1988). The Japanese version of the GHQ-28 has also proven to be valid and reliable (Kitamura, 1991), and showed good internal consistency (Cronbach’s alpha = .89) in the present study.
### Table 1

Pearson Correlations of the Major Variables for Two Age Groups

<table>
<thead>
<tr>
<th></th>
<th>IMMT</th>
<th>NEUR</th>
<th>MTR</th>
<th>NS</th>
<th>HA</th>
<th>RD</th>
<th>PS</th>
<th>SD</th>
<th>CO</th>
<th>ST</th>
<th>GHQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMMT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEUR</td>
<td>0.44**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MTR</td>
<td>0.24**</td>
<td>0.45**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NS</td>
<td>0.18*</td>
<td>0.01</td>
<td>0.12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HA</td>
<td>-0.03</td>
<td>-0.07</td>
<td>-0.49**</td>
<td>-0.33*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RD</td>
<td>-0.03</td>
<td>0.31**</td>
<td>0.29**</td>
<td>0.00</td>
<td>-0.12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS</td>
<td>0.14</td>
<td>0.23*</td>
<td>0.37**</td>
<td>-0.05</td>
<td>-0.14</td>
<td>0.16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>-0.37**</td>
<td>-0.03</td>
<td>0.39**</td>
<td>0.01</td>
<td>-0.53**</td>
<td>0.10</td>
<td>0.06</td>
<td>0.10</td>
<td>-0.19</td>
<td>-0.44**</td>
<td></td>
</tr>
<tr>
<td>CO</td>
<td>-0.14</td>
<td>0.41**</td>
<td>0.43**</td>
<td>-0.17</td>
<td>-0.18*</td>
<td>0.40**</td>
<td>0.21*</td>
<td>0.36**</td>
<td>0.23**</td>
<td>-0.10</td>
<td></td>
</tr>
<tr>
<td>ST</td>
<td>0.37**</td>
<td>0.49**</td>
<td>0.36**</td>
<td>0.22**</td>
<td>-0.24**</td>
<td>0.26**</td>
<td>0.28**</td>
<td>-0.05</td>
<td>0.28**</td>
<td>0.04</td>
<td></td>
</tr>
<tr>
<td>GHQ</td>
<td>0.19*</td>
<td>-0.01</td>
<td>-0.31**</td>
<td>-0.11</td>
<td>0.43**</td>
<td>-0.14</td>
<td>-0.15</td>
<td>-0.42**</td>
<td>-0.26**</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.09</td>
<td>0.09</td>
<td>0.06</td>
<td>-0.13*</td>
<td>0.08</td>
<td>-0.22**</td>
<td>0.03</td>
<td>-0.21**</td>
<td>-0.12*</td>
<td>0.20**</td>
<td>0.09</td>
</tr>
<tr>
<td>α</td>
<td>0.75</td>
<td>0.57</td>
<td>0.57</td>
<td>0.58</td>
<td>0.79</td>
<td>0.60</td>
<td>0.55</td>
<td>0.76</td>
<td>0.65</td>
<td>0.79</td>
<td>0.89</td>
</tr>
</tbody>
</table>

Note: Values for the younger age group are below the diagonal and the values for the older age group are above the diagonal. NS = novelty seeking; HA = harm avoidance; RD = reward dependence; PS = persistence; SD = self-directedness; CO = cooperativeness; ST = self-transcendence; IMMT = immature defense style; NEUR = neurotic defense style; MTR = mature defense style; GHQ = General Health Questionnaire.

* *p < .01. **p < .001.
Statistic Analysis

Age-related change is examined both linearly, that is, by computing the correlations between age and other measured variables, and categorically, that is, by group comparison in analysis of variance/multivariate analysis of variance (ANOVA/MANOVA) models. Participants were divided into two groups based on whether or not they had achieved 65 years of age, the generally recognized starting point of old age. Age 50 to 64 is referred to below as *younger group*, whereas aged over 65 is referred to as *older group*. Descriptive statistics including means and standard deviations of the target variables were computed separately, based on the age group and gender. Next, age and gender mean-level differences were tested by three MANOVA (2 Age Groups × 2 Genders) models for the TCI, the defense styles, and the discrete DMs, together with a 2 (age group) × 2 (gender) ANOVA for the GHQ. Significant Age × Gender interaction was further examined by ANOVA. Thereafter, Pearson coefficients were calculated separately to compare the correlations between indicators in the two age groups. Lastly, regression analysis assessed the predictive validity of the two constructs as predictors of the GHQ scores.

Results

Descriptive Statistics and MANOVA

Table 2 summarized age and gender-specific descriptive statistics and significant results of three models, that is, two MANOVAs with the TCI and the DSQ as dependent variables, respectively and ANOVA with the GHQ as dependent variable. Results showed substantial age-related decreases in reward dependence, self-directedness, cooperativeness, and increases in self-transcendence and immature DMs. Gender differences indicated significantly higher harm avoidance, reward dependence, cooperativeness, neurotic defense style, and the GHQ in women compared with men. A significant Age × Gender interaction was found in persistence, immature defense style, mature defense style, and the GHQ. Table 3 displayed significant results of MANOVA with individual DMs as dependent variables. Specifically, the older group scored significantly higher in isolation, denial, and splitting; men scored higher in passive aggression, acting out, and anticipation, whereas women scored higher in somatization, undoing, idealization, reaction formation, and sublimation. A significant Age × Gender interaction was found for acting out, displacement, dissociation, sublimation, and humor. Effect size ($\eta^2$) of the significant results ranged from .02 to .07.
Table 2
Descriptive Statistics and MANOVA for the TCI, the DSQ, and ANOVA for the GHQ

<table>
<thead>
<tr>
<th>Variable</th>
<th>50-64 (N = 134)</th>
<th>65+ (N = 196)</th>
<th>Gender</th>
<th>Age</th>
<th>Gender × Age</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men (n = 75)</td>
<td>Women (n = 59)</td>
<td>Men (n = 92)</td>
<td>Women (n = 104)</td>
<td></td>
</tr>
<tr>
<td>NS</td>
<td>9.55 (2.80)</td>
<td>9.52 (3.54)</td>
<td>9.28 (2.95)</td>
<td>8.37 (2.94)</td>
<td></td>
</tr>
<tr>
<td>HA</td>
<td>10.28 (4.52)</td>
<td>10.75 (4.16)</td>
<td>10.26 (4.15)</td>
<td>11.97 (3.81)</td>
<td>4.23*</td>
</tr>
<tr>
<td>RD</td>
<td>9.72 (2.78)</td>
<td>10.42 (2.57)</td>
<td>8.45 (2.91)</td>
<td>9.44 (2.38)</td>
<td>6.15*</td>
</tr>
<tr>
<td>PS</td>
<td>2.29 (1.43)</td>
<td>2.77 (1.59)</td>
<td>2.99 (1.31)</td>
<td>2.59 (1.37)</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>16.97 (4.58)</td>
<td>16.40 (4.49)</td>
<td>15.01 (4.36)</td>
<td>15.13 (4.35)</td>
<td></td>
</tr>
<tr>
<td>CO</td>
<td>17.09 (3.00)</td>
<td>18.52 (3.29)</td>
<td>16.32 (3.79)</td>
<td>17.40 (3.29)</td>
<td>8.56**</td>
</tr>
<tr>
<td>ST</td>
<td>4.85 (3.35)</td>
<td>4.96 (2.62)</td>
<td>5.86 (3.52)</td>
<td>5.64 (3.27)</td>
<td>4.18*</td>
</tr>
<tr>
<td>IMMT</td>
<td>94.24 (20.98)</td>
<td>97.50 (19.15)</td>
<td>105.00 (19.99)</td>
<td>98.34 (23.26)</td>
<td>5.46*</td>
</tr>
<tr>
<td>NEUR</td>
<td>32.93 (9.57)</td>
<td>36.72 (8.34)</td>
<td>34.34 (8.23)</td>
<td>37.64 (9.75)</td>
<td>11.08**</td>
</tr>
<tr>
<td>MTR</td>
<td>39.38 (10.24)</td>
<td>44.28 (8.97)</td>
<td>43.26 (8.21)</td>
<td>42.32 (8.87)</td>
<td>7.51**</td>
</tr>
<tr>
<td>GHQ</td>
<td>5.83 (5.06)</td>
<td>5.98 (5.59)</td>
<td>5.29 (4.61)</td>
<td>8.31 (6.44)</td>
<td>6.52*</td>
</tr>
</tbody>
</table>

Note: NS = novelty seeking; HA = harm avoidance; RD = reward dependence; PS = persistence; SD = self-directedness; CO = cooperativeness; ST = self-transcendence; IMMT = immature defense style; NEUR = neurotic defense style; MTR = mature defense style; GHQ = General Health Questionnaire.

*p < .05. **p < .01.
Table 3
Descriptive Statistics and MANOVA of Individual Defense Mechanisms

<table>
<thead>
<tr>
<th>Variable</th>
<th>50-64 (N = 133)</th>
<th>65~ (N = 196)</th>
<th>Gender F</th>
<th>Age F</th>
<th>Gender × Age F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men (n = 75)</td>
<td>Women (n = 58)</td>
<td>Men (n = 92)</td>
<td>Women (n = 104)</td>
<td></td>
</tr>
<tr>
<td>Paag.</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8.64 (3.08)</td>
<td>7.89 (2.82)</td>
<td>9.33 (3.16)</td>
<td>8.27 (3.07)</td>
<td>6.32*</td>
</tr>
<tr>
<td>Act.</td>
<td>7.97 (3.94)</td>
<td>8.13 (3.55)</td>
<td>9.22 (3.62)</td>
<td>6.86 (3.59)</td>
<td>6.44*</td>
</tr>
<tr>
<td>Iso.</td>
<td>7.74 (3.36)</td>
<td>7.56 (3.21)</td>
<td>8.53 (3.66)</td>
<td>8.95 (3.43)</td>
<td>7.32**</td>
</tr>
<tr>
<td>Dnl.</td>
<td>6.93 (3.32)</td>
<td>7.78 (3.52)</td>
<td>8.51 (3.32)</td>
<td>8.35 (3.73)</td>
<td>6.93**</td>
</tr>
<tr>
<td>Dpl.</td>
<td>7.61 (2.98)</td>
<td>8.98 (4.15)</td>
<td>9.14 (3.48)</td>
<td>8.42 (3.62)</td>
<td>6.25*</td>
</tr>
<tr>
<td>Dso.</td>
<td>6.18 (3.49)</td>
<td>6.72 (3.92)</td>
<td>6.92 (3.83)</td>
<td>5.51 (3.38)</td>
<td>5.19*</td>
</tr>
<tr>
<td>Splt.</td>
<td>7.67 (3.70)</td>
<td>7.07 (3.13)</td>
<td>8.73 (3.55)</td>
<td>8.44 (3.95)</td>
<td>8.00**</td>
</tr>
<tr>
<td>Som.</td>
<td>8.03 (4.22)</td>
<td>9.65 (4.03)</td>
<td>8.94 (3.76)</td>
<td>10.11 (4.27)</td>
<td>8.43**</td>
</tr>
<tr>
<td>Undo.</td>
<td>8.60 (3.05)</td>
<td>9.59 (3.10)</td>
<td>9.26 (3.34)</td>
<td>9.96 (3.57)</td>
<td>4.78*</td>
</tr>
<tr>
<td>Idl.</td>
<td>7.19 (3.88)</td>
<td>8.02 (3.49)</td>
<td>7.41 (3.62)</td>
<td>8.56 (4.13)</td>
<td>4.85*</td>
</tr>
<tr>
<td>Reform</td>
<td>7.56 (3.29)</td>
<td>8.69 (3.61)</td>
<td>7.73 (3.28)</td>
<td>9.45 (3.53)</td>
<td>12.54***</td>
</tr>
<tr>
<td>Subl.</td>
<td>8.72 (3.67)</td>
<td>11.76 (3.56)</td>
<td>10.32 (3.74)</td>
<td>11.18 (3.49)</td>
<td>20.81***</td>
</tr>
<tr>
<td>Hum.</td>
<td>9.69 (3.76)</td>
<td>11.46 (3.96)</td>
<td>10.20 (3.25)</td>
<td>9.86 (3.92)</td>
<td>6.51*</td>
</tr>
<tr>
<td>Anti.</td>
<td>12.21 (3.44)</td>
<td>11.65 (3.43)</td>
<td>12.97 (2.94)</td>
<td>11.55 (3.92)</td>
<td>5.89*</td>
</tr>
</tbody>
</table>

Note: Only significant results of MANOVA are reported. Paag. = passive aggression; act. = acting out; iso. = isolation; dnl. = denial; dpl. = displacement; dso. = dissociation; splt. = splitting; som. = somatization; undo. = undoing; idl. = idealization; reform = reaction formation; subl. = sublimation; hum. = humor; anti. = anticipation.

*p < .05, **p < .01, ***p < .001.
Each significant Age × Gender interaction was further tested by ANOVA. Results revealed that in the older group, compared with women, men scored substantially higher in persistence ($F[1, 317] = 9.49, p < .01$), acting out ($F[1, 323] = 15.03, p < .001$), dissociation ($F[1, 323] = 6.62, p < .05$), and lower in the GHQ ($F[1, 320] = 14.36, p < .001$), whereas in the younger group, men scored lower in displacement ($F[1, 321] = 5.24, p < .05$), sublimation ($F[1, 319] = 17.83, p < .001$), and humor ($F[1, 321] = 7.37, p < .01$). Results also showed that older men were more persistent ($F[1, 317] = 8.94, p < .01$), used more displacement ($F[1,321] = 10.03, p < .01$) and sublimation ($F[1, 319] = 6.26, p < .05$), whereas older women used less humor ($F[1, 321] = 9.77, p < .01$) and scored higher in the GHQ ($F[1, 320] = 14.36, p < .001$) compared to their younger counterparts. Higher GHQ score indicates more physical and psychological symptoms.

**Correlation Analysis**

Intercorrelations among all variables were calculated separately, based on the two age groups. Results (Table 1) showed some discrepancies between the two groups, for example, reward dependence and cooperativeness correlated positively with mature defense style in the younger group but negatively with immature defense style in the older group; immature defense style was only significantly associated with the GHQ in the younger group but not in the older group. Using the whole sample, age was found to be negatively associated with novelty seeking, reward dependence, self-directedness, cooperativeness, and positively associated with self-transcendence. Defense styles were not significantly correlated with age. Both correlation analyses and MANOVA revealed consistent age-related changes in the TCI dimensions of reward dependence, self-directedness, cooperativeness, and self-transcendence.

**Regression Analysis**

The multiple linear regression analysis with the GHQ as dependent variable revealed two significant predictors among TCI and DSQ variables (Table 4). Harm avoidance alone accounted for 23% of the variance whereas self-directedness contributed an additional 4%, indicating that higher level of harm avoidance deteriorates, whereas greater self-directedness contributes to health. Failing to support the initial hypothesis, defense styles showed no significant relationship in predicting the GHQ.
The present study examined age and gender differences in Cloninger’s biosocial model of personality as well as the use of DMs in late adulthood. The findings intriguingly indicated that the use of some DMs may be associated with the management of resource loss in late adulthood, and that men and women may employ different DMs in the adaptation to aging.

First, older adults were found to use more immature DMs of isolation, denial, and splitting than younger adults. Isolation and denial ward off painful perceptions from the external world, whereas splitting simplifies one’s cognition by dichotomizing the self and the object into either good or bad, resulting in a curtailed emotional space. More use of these DMs may link with a decreased cognitive-affective complexity (Labouvie-Vief & Marquez, 2004) and less experience of negative emotions in older adults (Carstensen, Pasupathi, Mayr, & Nesselroade, 2000; Charles, Reynolds, & Gatz, 2001; Chipperfield, Perry, & Weiner, 2003), due to the reason that these DMs are descriptive of emotion avoidance (Muris & Merckelbach, 1996) or image distortion (Bond et al., 1983; Ruuttu et al., 2006), sharing in common the blunting of emotional reactions or ignoring some aspect of reality. Researchers argue that older adults selectively process positive emotions to a greater degree due to a perceived time constraint (socioemotional selectivity theory; Carstensen, Fung, & Charles, 2003; Mather & Carstensen, 2005), and tend to endorse more passive emotion-regulation strategies rather than proactive ones in their everyday problem solving (Blanchard-Fields et al., 2004). Increased use of the emotion-avoidance or image-distortion DMs may function to generate positivity biases by selective attention, inhibition of negative arousals, and detachment of negative emotions from adverse reality, and consequently benefit management of the inevitable resource diminishment associated with aging. Therefore, the

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>SRC</th>
<th>$R$ Cum</th>
<th>Adjusted $R^2$ Cum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Harm avoidance</td>
<td>0.367</td>
<td>0.486</td>
<td>0.233***</td>
</tr>
<tr>
<td>2. Self-directedness</td>
<td>–0.243</td>
<td>0.530</td>
<td>0.275***</td>
</tr>
</tbody>
</table>

$F(1, 238) = 46.40, p < .001$

Note: Dependent variable: General Health Questionnaire, $n = 239$. $R$ Cum = cumulative amount of explained variance; SRC = standardized regression coefficient. ***$p < .001$.

Discussion

The present study examined age and gender differences in Cloninger’s biosocial model of personality as well as the use of DMs in late adulthood. The findings intriguingly indicated that the use of some DMs may be associated with the management of resource loss in late adulthood, and that men and women may employ different DMs in the adaptation to aging.
increased use of some immature DMs may connote an adaptive meaning. Current findings supported such possibility by showing that immature defense style negatively correlated with health only among younger adults. However, future research need to provide more empirical evidence for the link between defense use and emotion regulation in late adulthood.

Age-related differences in Cloninger’s biosocial model of personality were examined both linearly and categorically, and results consistently showed a significant decline in reward dependence and cooperativeness. Empirical evidence suggests that aging is increasingly experienced in terms of physical decline or social loss as opposed to continuous growth (Steverink, Westerhof, Bode, & Dittmann-Kohli, 2001), and older adults tend to deliberately discontinue their less important social relationships (Lang, 2001). Our findings of a lower reward dependence and cooperativeness in old age may be associated with this shrinking sphere of social life, whether enforced or voluntary. An age-related increase was found in self-transcendence, a trait related to enlightenment, wisdom, and spirituality (Cloninger et al., 1994), which may imply the spiritual development in late life.

Gender differences found in this study were generally in line with the initial hypotheses. The stronger susceptibility to anxiety (higher harm avoidance) in women has been thus far supported by both genetic (e.g., Jang, Stein, Taylor, & Livesley, 1999) and epidemiological (e.g., Fullerton et al., 2001) studies. Higher reward dependence and cooperativeness scored by women may stem from the more relationally oriented characteristics of women (Nolen-Hoeksema, 2002; Timmers, Fischer, & Manstead, 1998). Frequent use of neurotic DMs such as reaction formation may as well assist achievement of such relation-oriented goals. Current study revealed that women demonstrate a stronger tendency toward somatization, whereas men employ more passive aggression and acting out. These findings are in line with previous evidence (e.g., Holi, Sammallahti, & Aalberg, 1999; Ruutu et al., 2006) and support the theoretical conjecture that the masculine DMs are outwardly directed whereas the feminine DMs are inwardly directed (Cramer, 2006). Greater somatization generates more physical symptoms, whereas high level of harm avoidance is associated with psychological distress such as anxiety and depression. Both factors may result in lower level of general health condition in women.

Another interesting issue is about Age × Gender interactions. Despite the inference that pattern of adulthood personality development may be consistent across gender (Helson, Kwan, et al., 2002), current findings revealed Age × Gender interactions and suggest that men and women may differ in their use of DMs in the process of aging whereas developmental patterns on
the trait level remain identical. Results showed that older men use more displacement and sublimation whereas older women use less humor. Increased use of sublimation in men may be partially attributed to change in social roles such as retirement. In Japan, there is larger percentage of men working until their retirement age (65 years) than women, and change in lifestyle due to retirement may allow older men to involve themselves more into artistic activities. Humor may be understood as a positive affect whose stability in old age is related to high level of Extraversion (Charles et al., 2001). Humor in men may accordingly be maintained by more use of extraverted masculine DMs, whereas in women, may decrease over time due to higher harm avoidance and more use of inwardly directed DMs.

Lastly, the GHQ score was significantly predicted by harm avoidance and self-directedness, but not by defense styles as hypothesized. Though associations between immature DMs and psychopathology are well established in clinical samples, they seem to be less salient in normal population and in older age. The result that correlations found between defense styles and the GHQ in younger group disappeared in older group may suggest an abated rather than intensified impact of defense use. Significant predictability of harm avoidance and self-directedness on one’s health condition endorses recent research findings on consistency of Conscientiousness in predicting mortality (e.g., Weiss & Costa, 2005). Harm avoidance refers to a heritable tendency toward behavioral inhibition and is regulated by the serotonin system, and self-directedness is based on the concept of the self as an autonomous individual (Cloninger et al., 1994). The result upholds the evidence that harm avoidance increases susceptibility to illness as a genetic risk factor, and suggests that a mature and strong self may function as protective agent. It is intriguing to find that it is the self-oriented trait rather than the relation-oriented trait (e.g., cooperativeness) that significantly predicts health condition in later life due to interpersonal flourishing, which is usually argued to be the pivotal social environmental factor that aids healthy functioning (Ryff & Singer, 2005). This may be understood that high individual autonomy serves to maintain healthy habits and adherence to medical care, which are especially important for older adults. The unexplained portion suggests the existence of other pieces in the puzzle of aging and health relations, and interactions among genetic and environmental factors may be nonlinear.

Several limitations to the present study need to be addressed. Foremost, given the cross-sectional nature of data collection, there is a lack of longitudinal evidence on the causal paths underlying the associations found. In addition, many important variables such as marital status, income, and education were not included, which severely restricted the interpretation of the results.
A further concern is the low alpha coefficients shown in several variables, which may be partially attributed to the limited items (e.g., persistence). Although similar results have been documented elsewhere (e.g., Ando et al., 2002), low internal consistency questions the reliability of the findings. Future research need to adopt longitudinal design, include more demographic factors, and combine multiple methodologies such as semistructured interview for assessing health condition and unconscious defense.

In sum, despite these limitations, the present study contributes to the neglected theme of defense use in late adulthood and highlights the function of some DMs in coping with aging as well as an important pattern of associations between the two major demographic variables of age and gender and personality traits. Current findings may also benefit clinical applications, for example, intervention and prevention design, to enhance older adults’ general health and psychological well-being.

References


