The development of defense mechanisms from pre-adolescence to early adulthood: Do IQ and social class matter? A longitudinal study

Phebe Cramer *

Department of Psychology, Williams College, Bronfman Science Center, 18 Hoxsey St., Williamstown, MA 01267, United States

A R T I C L E   I N F O

Article history:
Available online 1 February 2009

Keywords:
Defense mechanisms
Longitudinal study
IQ
Social class

A B S T R A C T

The defense use of participants in the Berkeley Guidance Study, Intergenerational Studies, University of California, Berkeley, was traced longitudinally from pre-adolescence (n = 130) to early adulthood (n = 120). Of these participants, 78 were assessed at both ages, making it possible to assess defense change. As coded from their TAT stories using the Defense Mechanism Manual [DMM: Cramer, P. (1991a). The development of defense mechanisms: Theory, research and assessment. New York: Springer], the results showed change in defense use at adulthood. Consistent with previous findings, the defense of Projection was used more frequently than Denial at both ages. However, in adulthood there was a decline in the relative prevalence of Identification and an increase in the relative prevalence of Denial. This change in defense use between pre-adolescence and early adulthood was predicted by both childhood IQ and social class.

1. Introduction

Recent research has shown a renewed interest in the functioning of defensive processes as these relate to personality functioning (e.g., Cramer, 2000; Fraley & Brumbaugh, 2007; Segal, Coolidge, & Mizuno, 2007). However, apart from the work of Vaillant (1993), there is little information available regarding how defense mechanisms may change between adolescence and adulthood, and no research has examined how defense use may vary as a joint function of intelligence and social class.

Cramer (1991a, 2006) has proposed a theory of defense mechanism development which suggests that different defense mechanisms become predominant at different stages in development. For each defense there is a developmental trajectory characterized by increased use at one point in development, followed by a decline in importance as another defense becomes predominant. Three defenses representing different degrees of cognitive complexity and developmental maturity – denial, projection and identification – have been studied extensively. A detailed description of the characteristics of each of these defenses is provided in Cramer (1991a, 2006).

Based on the theory, the DMM method has been used to study the development of defense mechanisms from early childhood through late adolescence. The initial cross-sectional study (Cramer, 1991a) demonstrated that the predominant defense for very young children was denial, occurring significantly more often than projection or identification. In middle childhood and early adolescence, projection was found to be predominant. By late adolescence, identification was found to be the most frequently used of the three defenses. The initial results were replicated in an independent laboratory, in a different geographical location, some 10 years later (Porcerelli, Thomas, Hibbard, & Cogan, 1998), and have been confirmed in a number of other studies (Cramer, 2006).

1.1. Defense mechanism maturity

There are two ways to conceptualize defense mechanism maturity. The definition of maturity may be based on the relation between age and defense prominence. Thus denial may be characterized as “immature” because it is characteristic of young children, whereas identification may be characterized as “mature” because it is characteristic of an older period of development. However, it is possible that, similar to denial and projection, the use of identification declines after a period of predominance during late adolescence. Several investigations suggest that this might be the case. Cross-sectional data from three different community samples have shown that identification scores for adults did not exceed those for projection (Cramer, 2007; Cramer & Block, 1998; Cramer & Tracy, 2005).

Alternatively, maturity may be defined in terms of the number and complexity of cognitive operations required for the defense to function (Cramer, 2006). From this vantage point denial is immature because, at base, it requires only the addition of a negative marker (e.g., “no”, “not”) to a thought or feeling. Projection is more mature because it involves more and more complex cognitive operations – e.g., differentiation between self and other, ability to make value judgments (e.g., good/bad), and attribution of internal thoughts/feelings to the external world. Identification is the most mature of the three defenses in this scheme, because it requires
even more complex cognitive operations – e.g., the recognition of both cognitive and affective differences between self and other, and the selection and internalization of certain behavior patterns, attitudes and values of admired others (Cramer, 2006).

In addition to the cross-sectional studies mentioned above, there are now two longitudinal studies with the DMM. The first study followed the same group of children from age 6 to age 9 (Cramer, 1997). The second study followed another group of children from age 11 to age 18 (Cramer, 2007). The results of these two studies demonstrated the same general pattern of developmental change as found in the cross-sectional data. However, there is little information regarding the development of defenses between adolescence and adulthood. Perhaps the best known longitudinal investigation of defense use is that conducted by Vaillant (e.g., 1993), who followed fifty Harvard College men from college into adulthood. Comparing late adolescence to adulthood, Vaillant found evidence for defense instability, as demonstrated by mean level change across age. However, within the period of adulthood, researchers have found evidence for defense stability, as assessed by rank order correlation (e.g., Haan, 1977; Nelson & Moane, 1987; McCrae, 1989).

1.2. Defense use and IQ: age differences

In adulthood, a significant relation between IQ and defense use has been found in several studies (e.g., Baxter, Becker, & Hooks, 1963; Haan, Stroud, & Holstein, 1973). In general, higher IQ was associated with the use of more mature defenses. This suggests the possibility that IQ may be related to the development of identification. The longitudinal study of community participants ages 11–18 mentioned above (Cramer, 2007) provides some evidence for this. Adolescents with higher IQs (range 123–146) showed the expected increase in identification between age 11 and age 18; those with lower IQs (range 103–122) did not show this increase, and their identification scores at age 18 were lower than those of the high IQ participants.

One explanation for the relation of IQ to late adolescent and adult defense use is that there is a “match” between the cognitive complexity of a defense mechanism and the cognitive level of an individual (Cramer, 1999; Koch, Chandler, & Harder, 1982). Denial is a defense that “matches” with lower levels of intellectual development, because it is a cognitively simple operation. In contrast, identification is considerably more complex and “matches” better with a higher intellectual level. Thus adults with lower IQs might be expected to show relatively higher use of denial, whereas those with higher IQs might be expected to show great use of the defense of identification.

Interestingly, IQ appears unrelated to defense use in childhood (Cramer & Brilliant, 2001; Haan, 1977; Hart & Chmiel, 1992). One might assume that individuals with greater cognitive ability (higher IQ) would be able to use more cognitively complex defenses. The fact that this relation is not found in childhood is likely due to the changes that are occurring as part of normal development. During childhood and adolescence, the use of the three defenses – denial, projection and identification – is in flux. At any one age, or IQ level, the gradual decrease in the use of one defense may overlap with a gradual increase in another, and the timing of these changes may differ across children.1 On the other hand, IQ level may be expected to be more stable across age (Moffitt, Caspi, Harkness, & Silva, 1993). It is likely that the waxing and waning of defense use in childhood makes it difficult to demonstrate a consistent relation between childhood defense use and IQ. By adulthood, the use of the three child/adolescent defenses has likely stabilized, and a consistent relation between the three defenses and IQ can be demonstrated.

1.3. Defense use and SES

Research has shown that SES is inversely related to life stress (Adler et al., 1994), and those children who live in a financially deprived environment experience more stress (Hart, Atkins, & Matsuba, 2008). Since numerous studies have shown the relation between stress and defense use (cf. Cramer, 2006), low SES might be expected to be related to defense use.

There is some evidence for this. In a recent large scale (N = 1500) study of Finnish adolescents representing all social classes, those adolescents from the lower classes were more likely to use less mature defenses, as assessed by the self-report Defense Style Questionnaire, whereas the use of mature defenses was unrelated to social class (Poikolainen, Kanerva, & Lonqvist, 1995). Also, in a study of working class men (age 47), there was evidence that membership in the lowest SES class was related to defense immaturity (Vaillant & Drake, 1985).

It has also been hypothesized that defense use is related to SES as a result of social learning. Miller and Swanson (1960) hypothesized that defense use would be related to SES-based on different disciplinary practices associated with different social class levels, although they did not find supporting evidence. Weinstock (1967) focused on the role of modeling – i.e., children learn to use the defenses used by their parents. He found that the use of denial by adults was strongly related to early family environment, which he interpreted as evidence that denial is established early in the child’s development and so is subject to greater familial influence.

1.4. The present study

A limitation in these previous investigations is that IQ and SES, as related to defense use, were not investigated in the same study. Since IQ and adult SES are often found to be positively correlated (e.g., Deary et al., 2005) and to be significant predictors of important life outcome variables (Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007), the relation of these two factors to defense use should be considered conjointly. Using a longitudinal sample in which both males and females are followed from pre-adolescence into adulthood, we investigate these relations.

Hypotheses 1. The use of Identification will decrease between pre-adolescence and early adulthood, because issues of identity and identification are developmental tasks that are associated with adolescence, but are generally resolved by early adulthood (Erikson, 1968). No hypotheses are made regarding change in Denial and Projection.

Hypothesis 2a. Although intelligence and defense mechanisms are both ego functions, they do not develop in tandem. Further, although IQ is relatively constant across age, the use of any defense is characterized by increases and decreases occurring at different points in development for different children. Therefore, IQ will be unrelated to defense use at pre-adolescence.

Hypothesis 2b. Previous research has consistently shown a relation between IQ and adult defenses. Once defenses have emerged and stabilized in adulthood, IQ will be related to defense use, based on the “match” hypothesis. At early adulthood, IQ will be positively related to the more cognitively complex defense of Identification, and negatively related to the less complex defenses of Denial and Projection.

---

1 This idea of differential change in defenses – increasing for one child, decreasing for another – is similar to the idea of ‘overlapping waves’ (Segler, 2000). Developmental psychologists use the concept of ‘overlapping waves’ to describe the gradual emergence of difference cognitive abilities at successive ages, noting that as one ability continues to emerge, a new ability will begin to appear and thus will overlap with the development of the earlier ability.
Hypothesis 3a. As with IQ, childhood SES will not be related to pre-adolescent defense use, due to the waxing and waning of the use of individual defenses.

Hypothesis 3b. The influence of childhood social environment (SES) on defense use will be seen in early adulthood, when defenses are more stable. The longer the defense has been active during childhood, the greater the exposure to the social environment, and thus the greater the opportunity for environmental influence. Denial emerges in very early childhood, and so should be most influenced by childhood SES. Based on theory and previous research, we expect that low SES will be related to greater use of Denial in adulthood. Projection typically becomes prominent between ages 9–12 and so should be less influenced by childhood SES. Higher SES will be related to greater relative Projection because these individuals are less likely to manifest low SES-based Denial, and are more likely to follow the typical developmental pathway of defense development. Identification, which does not become prominent until adolescence, will be little influenced by childhood SES.

Hypothesis 3c. Adult SES will be unrelated to adult defense use. We assume that, by adulthood, the three defenses under study are no longer developing, have stabilized, and thus are not influenced by current external environment.

2. Method

2.1. Participants

The participants in this research come from the Berkeley Guidance Study, a longitudinal sample of over 200 individuals followed from birth for more than 60 years by the Institute of Human Development, University of California, Berkeley. Participants were born in 1928–1929; their childhood and early adolescent years coincided with the Great Depression, a time of great economic hardship for many families. The sample is 97% white and generally representative of the Berkeley community at the time the study commenced (Eichorn, 1951).

From this larger group, a core sample consisting of all individuals who had provided TAT stories at pre-adolescence and/or at early adulthood was constituted. This resulted in 130 pre-adolescents (age 11 or 12; 68 males, 62 females). At early adulthood (age 30 or 31) 120 participants (53 males, 67 females) provided stories. Among these participants, there were 78 who had defense scores at both ages. There were no significant differences between those who had defense scores at both pre-adolescence and adulthood and those who had defense scores at only one age for the variables under study.

2.2. Measures

2.2.1. Defense mechanisms

At each age, participants were seen individually. They were given the standard instructions for telling stories to the TAT cards (Murray, 1943). Stories were tape recorded and subsequently transcribed.

The Defense Mechanism Manual (DMM: Cramer, 1991a) was employed to code the use of defense mechanisms. At each age, a standard set of TAT cards was presented. These included Cards 1 (a boy with a violin), 3gf (boy huddled on floor, gun alongside), 6bm (elderly woman standing with back to young man), and 14 (silhouette of man against a bright window). Each of the 1000 stories told was scored by an experienced coder for the presence of three defense mechanisms – Denial, Projection, and Identification – according to the DMM. For each defense, there are seven categories representing different aspects of the defense; each category is scored as many times as it occurs in each story (see Table 1). The scores for each category are then summed, yielding a total score for Denial, for Projection, and for Identification. In turn, these three defense scores may be added together to provide a Total Defense score.

This measure of defense mechanisms has been demonstrated in previous studies to have adequate inter-rater reliability, with children, adolescents and adults (e.g., Cramer, 1991a, 1997, 1998; Hibbard et al., 1994; Porcerelli et al., 1998; Sandstrom & Cramer, 2003). In the present study, a second coder, who had no knowledge of participant age, IQ, or SES, independently scored a random selection of 108 of the stories. The agreement between coders, based on the intra-class correlation coefficient, was .82 for Denial, .71 for Projecton, and .83 for Identification.

Table 1
Defense mechanism manual scoring categories: denial, projection, identification.

<table>
<thead>
<tr>
<th>Denial</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Omission of major characters or objects</td>
</tr>
<tr>
<td>(2) Misperception</td>
</tr>
<tr>
<td>(3) Reversal</td>
</tr>
<tr>
<td>(4) Statements of negation</td>
</tr>
<tr>
<td>(5) Denial of reality</td>
</tr>
<tr>
<td>(6) Overly maximizing the positive or minimizing the negative</td>
</tr>
<tr>
<td>(7) Unexpected goodness, optimism, positiveness, or gentleness</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Projection</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Attribution of hostile feelings or intentions, or other normatively unusual feelings or intentions, to a character</td>
</tr>
<tr>
<td>(2) Additions of ominous people, animals, objects, or qualities</td>
</tr>
<tr>
<td>(3) Magical or autistic thinking</td>
</tr>
<tr>
<td>(4) Concern for protection from external threat</td>
</tr>
<tr>
<td>(5) Apprehensiveness of death, injury or assault</td>
</tr>
<tr>
<td>(6) Themes of pursuit, entrapment and escape</td>
</tr>
<tr>
<td>(7) Bizarre story or theme</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Identification</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Emulation of skills</td>
</tr>
<tr>
<td>(2) Emulation of characteristics, qualities, or attitudes</td>
</tr>
<tr>
<td>(3) Regulation of motives or behavior</td>
</tr>
<tr>
<td>(4) Self-esteem through affiliation</td>
</tr>
<tr>
<td>(5) Work; delay of gratification</td>
</tr>
<tr>
<td>(6) Role differentiation</td>
</tr>
<tr>
<td>(7) Moralism</td>
</tr>
</tbody>
</table>

* A more complete version of the coding system appears in Cramer (1991a).
ception, and .82 for Identification, indicating adequate inter-rater reliability.3

The construct validity of the DMM has been demonstrated with experimental studies designed to test specific hypotheses derived from defense mechanism theory. For example, based on the theoretical tenet that the use of defense mechanisms should increase under conditions of stress, both children and college students have been found to show an increase in age-appropriate defense use following stress-inducing experimental interventions, such as presumed failure (Cramer & Gaul, 1988), rejection by a playmate (Sandstrom & Cramer, 2003), criticism of creative ability (Cramer, 1991b) and challenge to sex-role orientation (Cramer, 1998).

2.2.2. Intelligence

At age 12, participants were evaluated with the Stanford-Binet Intelligence test (S-B: Terman & Merrill, 1937). At age 40, participants were evaluated with the Wechsler Adult Intelligence Test (WAIS: Wechsler, 1955). Given the high stability of adult intelligence test scores between age 30 and age 60 (e.g., Schaele, 1994), it is assumed that IQ scores from age 40 are a reasonable estimate for IQ scores at age 30.

2.2.3. Socio-economic status

At birth and at age 18, SES was assessed using the Warner Index of Status Characteristics (ISC; Warner, Meeker, & Eells, 1949). At early adulthood (age 30), SES was assessed with the Hollingshead Index of Social Position (ISP; Hollingshead, 1957). Both of these measures are continuous; lower scores indicate a higher social class. The ISC and ISP continuous scores were transformed into standard scores (M = 50, SD = 10). To facilitate understanding, the standard scores for each SES measure were then reverse scored, such that a higher score indicates higher social class. For both measures, the continuous scores can be converted to five SES categories: Class I (Upper class); Class II (Upper middle class); Class III (Middle class); Class IV (Lower middle class); and Class V (Lower class). In the data analyses, both continuous scores and categories are used, depending on the analysis. Previous research has shown high agreement (r = .86) between the ISC and the ISP (e.g., Lawson & Boek, 1960).

3. Results

The first section of the results examines the use of defenses at pre-adolescence and at early adulthood, including only those participants for whom stories are available at both ages. This is followed by an examination of SES and IQ at each age. The next section of the results examines both mean level change in defense use between pre-adolescence and early adulthood, as well as the differential stability (rank order stability) of defense use between the two ages. The third section studies the role of IQ and SES as factors that either predict or are associated with defense mechanism change.

3.1. Defense mechanisms

Because adults often tell longer stories than children, thus providing more opportunity for coding defense use, raw defense scores were converted to relative defense scores. For each participant at each age, scores for the three defenses were summed, yielding a Total defense score (Denial + Projection + Identification). Then, the score for each individual defense was divided by the Total defense score, yielding a relative score for that defense (e.g., relative Denial = raw score Denial/Total defense score).

Table 2 presents the descriptive statistics for Denial, Projection and Identification at pre-adolescence and early adulthood for participants with defense scores at both ages. Fig. 1 shows that the relative Defense scores for participants with scores at both ages (the repeated group: n = 78) are virtually identical to those based on all participants (n = 130 at pre-adolescence, 120 at adulthood).

3.2. Descriptive statistics

3.2.1. Defense use: pre-adolescence

Pre-adolescent defense scores for those participants who also had adult defense scores were analyzed using a Defense(3) × Gender(2) repeated measures ANOVA (see Fig. 1). The results indicated a significant effect for Defense, F(2,152) = 46.06, p < .001, eta = .61. Projection (M = .44, SD = .21) was used more often than Denial (M = .12, SD = .17), t(77) = 8.75, p < .001, and Identification (M = .45, SD = .21) was used more often than Denial, t(77) = 9.30, p < .001. The use of Projection and Identification did not differ, p = .84. The Gender × Defense interaction was not significant, p = .80.4

3.3. Defense use: adulthood

The same analysis for adult defense use was carried out for the group of 78 participants who had defense scores for pre-adolescence (see Fig. 1). A Defense(3) × Gender(2) repeated measures ANOVA indicated a significant effect for Defense, F(2,152) = 35.52, p < .001, eta = .56. Projection (M = .48, SD = .17) was used more often than Identification (M = .21, SD = .17), t(77) = 8.19, p < .001, and more than Denial (M = .31, SD = .17), t(77) = 5.97, p < .001. Also, Denial was used more often than Identification, t(77) = 2.18, p < .03. The Gender × Defense interaction was not significant.5

3.3.1. SES

There is considerable variability in SES class. At birth, the distribution of participants across the five SES levels from highest (Class I) to lowest (Class V) was 0%, 5.4%, 17.1%, 36.4% and 41.1%. At age 18, the distribution was 0%, 5.5%, 16.5%, 34.1%, and 44.0%. A comparison of SES class at birth and at age 18 yielded a χ²

---

Table 2

<table>
<thead>
<tr>
<th>IQ</th>
<th>SES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-adolescent defenses</td>
<td>Adult</td>
</tr>
<tr>
<td>Projection</td>
<td>.10</td>
</tr>
<tr>
<td>Identification</td>
<td>-.10</td>
</tr>
<tr>
<td>Adult defenses</td>
<td>Denial</td>
</tr>
<tr>
<td>Projection</td>
<td>-.29</td>
</tr>
<tr>
<td>Identification</td>
<td>-.33</td>
</tr>
<tr>
<td>IQ</td>
<td>Age 12</td>
</tr>
<tr>
<td>Adult</td>
<td>Child</td>
</tr>
<tr>
<td>Adult</td>
<td>-.30***</td>
</tr>
</tbody>
</table>

---

3 Appreciation is expressed to Jason Luciano for this coding.

4 The same results were obtained when the total group (n = 130) was tested.
5 The same results were obtained when the total group (n = 120) was tested.
Contingency coefficient = .70, indicating that the majority of participants in each SES class at birth remained in that class at age 18. Since there is no significant change in family SES between birth and age 18, we will refer to the birth SES scores as childhood SES.

By adulthood and the end of the Depression, a substantial number of participants had moved into a higher social class; the distribution was: 15.6%, 32.2%, 41.1%, 10.0% and 1.1%. A comparison of birth SES class with adult SES class indicated that class membership at the two ages was not related, \( \chi^2 (df = 12) = 12.77, p = .39 \), with a non-significant Contingency coefficient = .35 reflecting this change.

### 3.3.2. IQ

For participants with pre-adolescent and adult Defense scores, the mean S-B IQ is relatively high (Range = 67–165; Mean IQ = 122.04, SD = 19.19). At adulthood, WAIS IQ Range = 92–141; Mean IQ = 122.01, SD = 9.92.

### 3.4. Assessment of defense change

Two methods were used to assess stability and change in defense use from pre-adolescence to adulthood. Rank order stability (consistency in the relative ordering of participants over time) was determined from test–retest correlation coefficients. Mean level change (change in the relative use of each defense over time) was determined using repeated measures ANOVA.

#### 3.4.1. Differential (rank order) stability

None of the cross-age defense correlations were significant: Denial, \( r = .08 \); Projection, \( r = -.02 \); Identification = -.06. Thus there was substantial change in the rank ordering of individuals for defense use across age.

#### 3.4.2. Mean level change: pre-adolescence to early adulthood

Based on the 78 participants who were assessed at both ages, Defense scores were analyzed using a repeated measures ANOVA, Defense(3) × Age(2) × Gender(2). Neither Gender, the Gender × Defense, nor the 3-way interaction was significant. There was a significant effect for Defense, \( F(2,152) = 55.39, p < .001, \eta^2 = .65 \), which is best understood in terms of the significant Age × Defense interaction, \( F(2,152) = 30.18, p < .001, \eta^2 = .70 \). The meaning of this interaction can be determined (1) by comparing scores on each defense at pre-adolescence with the same defense at adulthood, and noting, e.g., if there is a change in one defense and not another, or (2) by determining within each age group if one defense is used more than another and whether this differs by age group.

Comparing across ages, Identification was lower at adulthood, \( t(77) = -7.00, p < .001 \). Projection did not differ between adulthood and pre-adolescence, \( t(77) = 1.50, p = .14 \). Denial was higher at adulthood than at pre-adolescence, \( t(77) = 6.84, p < .001 \).

Within the pre-adolescent group, Projection and Identification were higher than Denial, \( t(77) = 8.75 \) and 9.30, \( p < .001 \). Projection and Identification did not differ, \( p > .83 \). Within the adult group, Projection was higher than Denial, \( t(77) = 5.97, p < .001 \), and Denial was higher than Identification, \( t(77) = 2.13, p < .03 \).

Overall, these results show that defense use changes significantly between pre-adolescence and adulthood. In addition, there is change within age in the relative salience (ipsative percentage) of the three defenses. Notably, the salience of Identification decreases, and the salience of Denial increases.

### 3.5. IQ and SES as related to defense use

The zero order correlations in Table 2 show that pre-adolescent Defenses are not related to either pre-adolescent or adult IQ or SES. However, early adult Defenses are correlated with IQ and with childhood SES. IQ is negatively related to adult Projection and positively related to adult Identification. Contrary to expectation, Denial was not (negatively) related to IQ. However, as predicted,
childhood SES is negatively related to adult Denial, and positively related to adult Projection. Table 2 also shows that the valence of the relation of childhood SES to IQ is different from that of the relation of adult SES to IQ. During childhood, IQ was negatively associated with social class. However, once in adulthood, the relation between IQ and SES is positive. From this finding it is not clear whether higher IQ individuals moved into higher social classes, or lower IQ individuals moved into lower social classes, or both. To clarify this relation, an SES change score was computed by subtracting the standard score for childhood SES from the standard score for adult SES; a positive score thus indicates an increase in SES. Using a median split, t-tests indicated that the change in the high IQ group (M = 8.52, SD = 14.49) was significantly different from 0, t(47) = 4.08, p < .001, as was the change in the low IQ group (M = −5.42, SD = 15.99), t(41) = −2.17, p < .04. Thus, high IQ individuals moved up in SES, whereas low IQ individuals moved down.7

3.6.1. Change in defense use as related to IQ and SES

3.6.1.1. Change in denial. Childhood SES negatively predicted change in the use of Denial at early adulthood, β = − .33, p < .01, \( F_{\text{change}}(1,73) = 6.66, p < .01 \). IQ was not significant (β = − .07).

3.6.1.2. Change in projection. Age 12 IQ negatively predicted change in the use of Projection at early adulthood, β = − .27, p < .02, \( F_{\text{change}}(1,74) = 5.88, p < .02 \). SES was not significant (β = .12).

3.6.1.3. Change in identification. Age 12 IQ positively predicted change in the use of Identification at adulthood, β = .34, p < .002, \( F_{\text{change}}(1,74) = 10.04, p < .002 \). SES was not significant (β = .20).

The results show that higher IQ at pre-adolescence is positively related to early adult change in Identification, and negatively related to early adult change in Projection. However, IQ was unrelated to change in Denial. Instead, the results show that lower childhood SES predicts an increase in early adult Denial.

3.6.2. Adult defense change as related to adult IQ and adult SES

Similar hierarchical regression analyses were run to investigate changes in adult defense, with adult IQ and adult SES as the independent variables. Preliminary analyses indicated that the IQ × SES interactions were not significant.

The effects of the hierarchical regression analyses indicated that change in Denial and Projection were not related to adult IQ (β = −.06 and −.19) or adult SES (β = .04 and .09). However, adult IQ was positively related to change in adult Identification, β = .25, p < .04, \( F_{\text{change}}(1,63) = 4.30, p < .04 \).8

4. Discussion

Previous work has traced the developmental patterns of denial, projection and identification from childhood through adolescence, showing that DMM identification may be considered the most mature of the three defenses over this period of life. The results of the present study, in concert with previous investigations (e.g., Cramer, 2003, 2007; Cramer & Block, 1998) show that DMM identification is not the predominant defense in community samples of early adults. This finding is consistent with defense mechanism theory that holds that individual defenses increase and then decrease in prominence at different periods of development (Cramer, 1991a, 2006). In the present sample, this decrease occurs for the defense of identification. Identification, which is mature for an adolescent, may decline in importance once the adolescent developmental task of establishing an identity has been accomplished.

Given the present findings, the two ways of defining defense maturity—age of prominence and cognitive complexity—should be considered separately. In the sense that an age predominant defense is considered ‘mature’, identification is no longer a ‘mature’ defense. Nevertheless, identification continues to be a more complex defense, and in that sense, it may be considered mature, although not characteristic of early adulthood, and previous research has shown that adults who use more identification show more positive functioning than those who use less identification (e.g., Cramer, 2003, 2004).

The lower use of identification in the present adult community sample is due both to developmental change (decrease), and to IQ differences between this sample and previous college samples. First, and importantly, the present longitudinal study makes it possible to demonstrate that decreased use of identification by adults does reflect developmental change, rather than differences between cohorts. However, IQ was positively related to the magnitude of identification change in adulthood. This finding is consistent with the “match” hypothesis—that brighter individuals are more likely to use a more cognitively complex defense. Consistent with this line of thinking, IQ was negatively related to the use of projection, a less complex defense. We may expect, then, that among adults, the overall level of identification and projection may be importantly determined by IQ.

The increase in the adult use of denial was unexpected. Some previous cross-sectional research has reported an increase in denial in older adults (e.g., Diehl, Coyle, & Labouvie-Vief, 1996; Segal et al., 2007), and a slight increase in denial has previously been noted in late adolescents (Cramer, 1987; Porcerelli et al., 1998). Also, contrary to expectation, early adult use of denial was not related to IQ level. The reason for this is not clear, as a negative relation between IQ and Denial has been found in previous research (e.g., Cramer, 2007), and IQ has frequently been found to moderate the relation between Denial and other personality variables, such that for low IQ individuals, the use of Denial serves a positive function (Cramer, 2003, 2004). However, in the present sample, the importance of early social environment, especially the Great Depression, but also World War II, the Korean War, and the unleashing of the atomic bomb—were stresses and threats over which the participants had no control. In this type of situation, denial may have been an adaptive solution for all (cf. Charles & Carstensen, 2007). Further, in addition to possible effects of positive reinforcement or modeling, the early lives of these individuals coincided with the period of development when children are most vulnerable to the adverse effects of economic hardship on cognitive growth (Elder, 1974, p. 138). Thus economic stress may have interfered with the usual progression of defense development—i.e., interfered with the diminution of denial and the increasing salience of projection.
Adult use of projection was also related to childhood SES: higher SES predicted greater use of Projection. These high SES pre-adolescents may have received more positive feedback, and/or more age-appropriate modeling from neighborhood peers than was true for their peers from lower SES levels, who were being reinforced for using denial. Or, they may have experienced less interference with normal cognitive/defense development caused by economically based stress. Nevertheless, even though childhood SES predicted adult use of projection, it did not influence change in the use of adult projection. Rather, it was low IQ that predicted an increase in adult projection, which may be explained by the “match” hypothesis.

The adult use of identification was not related to childhood SES. As a later emerging defense, there was less time for the early social environment to influence its use. Rather, in agreement with the “match” hypothesis, higher IQ was the significant predictor of greater use of identification in adulthood.

Finally, adult use of denial, projection and identification was unrelated to adult SES. The results thus indicate that childhood social environment is important for establishing the relative prevalence of adult defense use of childhood defenses. However, by early adulthood, socio-economic environment did not affect or modify the use of these three defenses.

The results also showed that childhood IQ was negatively correlated with social class, but adult IQ was positively correlated. This changed relation may be understood by considering the degree to which the participant had some control over his/her SES level at childhood and at adulthood. In childhood, as a result of economic Depression, parents lost their jobs and their income (SES level) declined. This occurred at every occupational level; many high IQ parents, previously at high SES levels, experienced significant SES declines. Based on the known correlation between parent and child IQ, the high IQ child is also now at a lower SES level, due to the parent’s lost income. This is a situation over which the child had no control; s/he can not influence the SES level of the family. However, once the participant has become an adult and the economic conditions have improved, the adult with a high IQ can now raise his/her SES level by using high intelligence to acquire a higher paying job, and the characteristic positive relation between IQ and SES is manifest.

4.1. Limitations

The present study suggests that the use of Identification may no longer be considered a ‘mature’ defense in adulthood, when mature is defined in terms of age salience. It may be that other, more mature defenses described by Vaillant (1993) that are not assessed in the present study, such as sublimation or altruism, have become predominant, in which case, these would be more salient than Projection.

A limitation in working with longitudinal data is that not all of the individuals who participate at one age will also be participants at a subsequent age. Although it is possible that in some cases this might bias the findings, for the present study there is little difference between the defense results obtained when all available participants are considered, and those obtained when limited to individuals present at both ages.

The participants of the present study also come from an earlier generation; one may raise the question of whether their defense development differs from that which would be found today. Lacking contemporary longitudinal data, this possibility can not be answered definitively. The fact that the present sample experienced a large number of serious life stressors should be considered when examining their adult use of defenses, as discussed above. However, the present results do show that the pattern of defense use in the pre-adolescents of this sample is the same as that of current samples, indicating the generalizability of the theory of defense mechanism development. Further, the pattern of early adult defense use in the present sample – projection exceeding identification and denial used equally or more often than identification – has been found in two other community samples from different time periods. The first of these samples was born about 10 years before the present sample (Cramer, 2002); the second was born 37 years after the present sample (Cramer & Block, 1998). Thus the defense findings are not limited to the individuals of a single generation.

Another limitation is that, as with other measures of defense mechanisms, we do not know if the defenses assessed with the DMM are used in everyday life situations. However, we do know that experimentally created life situations in which anxiety, anger or other negative affect is aroused results in increased DMM defense scores, with the particular defense that is increased being related to the age of the individual (cf. Cramer, 2006).

The present study has focused on the role of IQ and SES as factors for understanding defense use and change. It should be noted that the average IQ of the present sample is relatively high. However, there is a wide range of IQs within the sample. The results demonstrate that both IQ and SES – factors that are applicable to all individuals – are important for understanding defense use. Clearly, other factors may be important for understanding defense change in adulthood. Further research will focus on identifying these variables.

Acknowledgments

The data for this paper come from the Intergenerational Longitudinal Study conducted by the Institute of Human Development at the University of California, Berkeley. The Institute generously made the data available. Appreciation is expressed to Pamela Bradley for her great help in locating the TAT stories from the Institute archives.

References
