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The Mediating Role of Interpersonal Cognition on the Relationships Between Personality and Adolescent Ego Development

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ABSTRACT. The author investigated whether interpersonal cognition mediated the relationships between defense, social sensitivity, and ego development. Participants ($N = 616$; M age = 15.66 years, $SD = .52$ year; 276 boys) from northwestern Taiwan completed a battery of questionnaires. Structural equation modeling and mediation analyses supported the hypothesis that interpersonal cognition would mediate the path between defense and ego development, and the path between social sensitivity and ego development. Defense and social sensitivity were found to have direct effects on ego development. The study provides evidence of the mediating effect of interpersonal cognition on the association between personality and ego development.

Keywords: defense, ego development, interpersonal cognition, interpersonal sensitivity, personality

The stage theory of ego development proposed by Jane Loevinger (1976) provides a framework for understanding personality development throughout life. The theory suggests that the ego is a cognitively based structure, and that ego development is characterized by increasing degrees of differentiation, complexity, and integration in the various domains of personality. Ego development is viewed as proceeding along invariable stages of experiences that are hierarchical, step-wise, and qualitatively distinct; each stage designates a new way of organizing the experiences of both the self and other (or the world) (Hy & Loevinger, 1996; Loevinger, 1976). An extensive body of research provides substantial support for the conceptual soundness and validity of the theory (Manners & Durkin, 2000; Novy et al., 1994). Cross-cultural studies also provide evidence of the sequential

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process of ego development (see review by Carlson & Westenberg, 1998; Liu, 2009).

In a review of the processes involved in ego development, Manners and Durkin (2000) indicated that cognitive complexity and personality characteristics are two critical factors contributing to ego development. According to Loevinger (1976), cognitive development provides a range of possibilities for ego development. With a sufficient capacity for cognitive reasoning, the ego can develop to the advanced stage. Although cognitive complexity is related to ego development, Manner and Durkin (2000) suggested that ego development is interpersonal and emotional in nature and that it might be more closely related to socioemotional cognitive development than to logicomathematical development.

Although cognitive ability and personality are considered essential to ego development, previous studies have mainly investigated how each factor relates to ego development individually; studies have rarely integrated cognitive ability and personality to examine their relative influences on ego development. For example, studies of ego development in relation to cognition reveal that advanced ego development is related to higher levels of moral reasoning (Gfeller, 1986), intellectual development (Cramer, 1999; Liu, 2009), and social cognition related to interpersonal development (Schultz & Selman, 1998). Studies of ego development in relation to personality indicate that ego development is positively associated with openness to experiences (McCrae, 1993), ego resiliency (e.g., psychological mindedness, intellectualism, resiliency; Westenberg & Block, 1993), ego defense (Levit, 1993), and interpersonal characteristics such as empathy, nurturance, affiliation, closeness, and tolerance (as reviewed in John, Pals, & Westenberg, 1998). There are two studies that considered both cognitive ability (e.g., verbal SAT, and Weschler Adult-Intelligence Scale-Revised IQ [WAISR-IQ]) and personality in predicting ego development. The results of which indicate that verbal ability or IQ and personality (e.g., flexibility and psychological mindedness) both contribute to ego development (Cramer, 1999; Helson, & Roberts, 1994).

I believe that personality and cognition might function together in ego development. Shoda and Mischel (1996) proposed a cognitive-affective personality system (CAPS) and suggested that personality is linked to distinct cognitive-affective units. According to the CAPS theory, personality could be viewed as a dynamic, interconnected system or an organized network of cognition and affect. CAPS theory suggests that personality is a stable and intrinsic system that guides and constrains an individual's encodings and categories, expectancies and beliefs, affect, goals and values, and competencies and self-regulatory plans. Individual differences could be reflected by the individual's particular cognition and affect units. In a study related to this theory, people who were found to easily attribute negative events as internal, stable, and global were considered as being pessimistic and more prone to depression as a consequence (Peterson, Seligman, Yurko, Martin, & Friedman, 1998). Similar to the CAPS theory, Block (1982) proposed that people with certain personality characteristics would display a preference

for responding to life events by either assimilation or accommodation, resulting in personality stability or change. Following these conceptual frameworks, I expected that personality and cognition would not only have separate influences on ego development, but also that cognition might serve as the mediator between personality and ego development.

In this study I aimed to investigate the influences of personality and cognition ability on ego development in the interpersonal context of adolescence. According to Loevinger (1976), interpersonal development is an ego development component that changes sequentially in character, meaning, and worldview. Individuals at the lower level are egocentric in their relationships, and lack the interpersonal skills needed to maintain mutually rewarding relationships. As individuals progress through ego levels, they gradually develop greater complexity of thoughts and emotions, and their awareness of others' needs and their ability to respond to others' motives and overt behavior increases. Adolescents who have participated in successively complex peer networks may have had experiences in managing diverse and conflicting friendships. Studies have shown that ego development in adolescents is associated with their interpersonal styles (Hauser, 1978) and peer friendship choices (Hansell, 1981).

The interaction between interpersonal relationships and ego development was further elaborated by Schultz and Selman (1998). Selman et al. (1992) developed a social development model of interpersonal relationships that describes how adolescents develop the ability to differentiate and coordinate the social perspectives of themselves and others, both cognitively and emotionally. This model assumes that a person's capacity to coordinate his or her own and others' points of view regarding social experiences develops along with three components of psychosocial competence: interpersonal understanding, interpersonal skills, and personal meaning. These psychosocial competences determine how adolescents develop theoretical knowledge of the nature of relationships (interpersonal understanding), utilize strategies of negotiation and shared experience to balance intimacy and autonomy to make and maintain good relationships (interpersonal skills), and reflect and evaluate the intensity and quality of their actions and emotional investment in a particular relationship (personal meaning). Schultz and Selman (1998) found that ego development is positively related to interpersonal negotiation, shared experiences, interpersonal meaning, and interpersonal understanding.

I believe that with different interpersonal orientations, adolescents may demonstrate varying interpersonal cognition and behavior patterns while interacting with others. Among personal traits, interpersonal sensitivity is most likely to be related to successful interpersonal interaction. Interpersonal sensitivity can be defined as the correct identification and comprehension of another's behaviors, feelings, and motives (Rothenberg, 1970). Individuals with interpersonal sensitivity are able to perceive the emotions a partner experiences, infer the partner's thinking, decode the partner's attempts at communication, assess the social context within which a person seems to be communicating, and behave appropriately in

response to that knowledge (Hall & Bernieri, 2001). Empirical studies show that interpersonal sensitivity is positively correlated with other personality traits such as empathy, affiliation, extraversion, conscientiousness, openness, tolerance, interpersonal social competence, and interpersonal adjustment (Hall, Andrzejewski, & Yopchick, 2009). Interpersonal sensitivity is also related to good leadership, which requires establishing quality relationships while providing mutual respect, trust and emotional support, and skills in negotiation and conflict resolution (Hall & Bernieri, 2001). These studies support the view that socially sensitive people must have well-developed interpersonal cognition to make and sustain good relationships. I infer that individuals with higher sensitivity are more likely to proceed to higher ego development because a higher ego level corresponds to a greater degree of interpersonal tolerance, empathy, and affiliation (John et al., 1998).

In contrast to interpersonal sensitivity, which may facilitate social relationships, defense may have the opposite effect on interpersonal relationships. Defense can be conceptualized as both an intrapsychic mechanism (e.g., repression, isolation, splitting) and an interpersonal interaction process (Westerman, 1998; Westerman & Prieto, 2006). In ego development theory, the ego function involves the control of impulse (Loevinger, 1976), and the expression of impulse is modulated by the function of defense mechanisms (Cramer, 1999). Researchers employing the intrapsychic framework have found that ego development correlates positively with mature defenses (altruism, intellectualization, suppression, and identification), but is negatively correlated with less mature defenses (acting out, avoidance, denial, and displacement; as reviewed in Levit, 1993). Cramer (1999) further suggested that a lower ego level is associated with less mature defenses, whereas a higher level is related to more mature defenses. In contrast, researchers taking an interpersonal perspective propose that defense mechanisms develop within the context of close relationships, and function as a means of satisfying interpersonal goals (Zeigler-Hill & Pratt, 2007). Westerman (1998) proposed a theory of interpersonal defense, and suggested that people behave defensively to avoid feared outcomes (e.g., negative evaluation from others) and behave nondefensively to pursue wished-for outcomes. However, even though a nondefensive approach to an interaction is more likely to facilitate an individual's goal, a defensive person does not acknowledge that fact, but continues to behave defensively to avoid his or her fear. Jansson, Lundh, and Oldenburg (2005) found that defensiveness was associated with a cognitive bias away from potentially threatening information. Such defensive behaviors would prevent the individual from further interpersonal exchange. The long-term use of defensive behaviors often results in difficulties in interpersonal relationships, such as marital adjustment problems (Ungerer, Waters, Barnett, & Dolby, 1997). I believe that adolescents with defensive tendency in interpersonal interactions would thwart interpersonal interactions and ego development, whether the behavior is intended to fulfill specific interpersonal goals or to regulate the subject's inner psychological state.

Taking these reviews together, in the present study I proposed a personality-cognition model of ego development to investigate the relationship among interpersonal sensitivity, defensive behaviors, and adolescent ego development, and to determine how this relationship might be mediated by interpersonal cognition ability characterized by interpersonal understanding, negotiation, shared experiences, and personal meaning. I hypothesized that interpersonal sensitivity and defense would have both direct and indirect paths to ego development, and that the indirect paths would relate to interpersonal cognition. Moreover, I expected that interpersonal sensitivity would be positively related to ego development and interpersonal cognition, whereas defense would be negatively related to ego development and interpersonal cognition. I also expected interpersonal cognition to be positively related to ego development. Finally, previous studies have indicated that women are more likely to report higher levels of psychological defense (Zeigler-Hill & Pratt, 2007), interpersonal sensitivity (Hall et al., 2009), and ego development (Cramer, 1999; Liu, 2009) than men. Therefore, analyses with regard to the moderating role of adolescent gender were exploratory.

Method

Participants and Procedure

A total of 632 tenth-grade students (276 boys, 349 girls, and 7 unidentified) from northwestern Taiwan participated in the study. The adolescents completed the Washington Sentence Completion Test (WUSCT; Hy & Loevinger, 1996), the personality scales of the Cross-Cultural Personality Assessment Inventory for Adolescents (Cheung, Fan, Cheung, & Leung, 2008), and the Interpersonal Cognition of Interpersonal Relationship Scales (Liu, 2012). Data were collected by administering questionnaires in class at school. Cases with more than three items missing from each scale were excluded. As a result, 15 cases were discarded and 616 cases (271 boys, 339 girls, 6 unidentified; $M_{\text{age}} = 15.66$ years, $SD = 0.52$ years) were retained in the subsequent analyses.

Materials

Washington University Sentence Completion Test. The WUSCT (Form 81, see Hy & Loevinger, 1996) consists of 36 sentence stems that require participants to complete the sentences (e.g., “When a child will not join in group activities,” “A man’s job”). Each response is coded by trained raters according to a detailed scoring manual (Hy & Loevinger, 1996). Item-level scores range from E2 to E9 and follow a developmental progression including impulsive (E2), self-protective (E3), conformist (E4), self-aware (E5), conscientious (E6), individualistic (E7), autonomous (E8), and integrated (E9). The test was translated into Chinese following the translation–back-translation procedure. The WUSCT coding system

was revised for use with Chinese samples based on two samples of individuals aged approximately 13–14 years old and 18–22 years old (Liu, 2009; Liu & Yeh, 2011). Westenberg, Treffers, and Drewes (1998) reported that the design of the WUSCT allows for minor revisions to accommodate cultural characteristics. In accordance with the definition of developmental stages, I created 152 new categories for all sentence stems under each development level based on the response similarities and frequencies. Revisions of the scoring system maintained the intent of the coding system and its relevance to Taiwanese culture.

Before formally scoring the WUSCT, two coders were trained using established procedures (Hy & Loevinger, 1996). The final interrater agreement (both ratings at the same ego level) was .88. The borderline rules were used to arrive at a total protocol rating (TPR) for each participant with TPR scores corresponding to stages in ego development (E2–E9). The average ego level for the adolescents was near the conformity level ($M = 4.88$, $SD = 0.97$).

Cognitive Competence of Interpersonal Relationships Scale. This scale (Liu, 2012) is based on Schultz and Selman's (1998) tripartite interpersonal model and is used to measure interpersonal cognition. The scale consists of 20 items that measure the adolescent cognitive abilities of interpersonal understanding, interpersonal negotiation, shared experiences, and interpersonal meanings. Examples of items include "We can exchange different viewpoints with each other, even though we come from different backgrounds" (understanding); "I can account for the differences between us in ways he/she would accept" (negotiation); "I am better in facing inner vulnerability and insecurity through sharing my experiences with him/her" (experience sharing); and "Although we mutually depend on each other, we respect each other's independence and freedom" (personal meaning). Participants indicated their agreement with each item using a 6-point Likert-type scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). High scores indicate more mature interpersonal cognition. The alpha reliability of the whole scale is .94, and the reliabilities of the four dimensions of this scale for this study were .80, .84, .80, and .80 for understanding, negotiation, experience sharing, and personal meaning, respectively. The three-month test-retest reliability for the whole scale was .67.

Personality scales of the Cross-Cultural Personality Assessment Inventory for Adolescents. Two emic subscales of the Cross-Cultural Personality Assessment Inventory for Adolescents (CPAI-A; Cheung et al., 2008), defensiveness and social sensitivity, were used in this study to measure interpersonal sensitivity and defenses. The CPAI and its revised version, the CPAI-2 and CPAI-A (for adolescents) were originally developed in Chinese based on a combined emic-etic approach. The CPAI-A consists of 25 personality scales and 14 clinical scales, which represent four personality factors: dependability, social potency, individualism, and interpersonal relatedness. Although the CPAI was developed in a Chinese cultural

context, cross-cultural studies have shown the convergent validity between the etic structures of the CPAI, the Minnesota Multiphasic Personality Inventory (MMPI-2), and the NEO Personality Inventory-Revised (NEO PI-R) (Cheung, Cheung, & Zhang, 2004; Cheung et al., 2001). Defensiveness and social sensitivity are the subscales representing the emic personality factors of interpersonal relatedness. Respondents were asked to rate statements describing a personal characteristic or a typical behavior using a yes–no format. The scale of social sensitivity consists of 12 items, and measures adolescents' sensitivity and empathy toward others. An example of an item is "I can acutely detect others' feelings" (social sensitivity). The scale of defensiveness consists of eight items, and measures adolescents' perception bias toward others and aggressive attacks on the behaviors or reputations of other persons in the hope of showing to advantage in relation to the deflation of their stature. Examples of the items include "If I were not invited to a friends' gathering, that would be their loss" or "If I were luckier, I would be superior to others in many aspects" (defensiveness). The alpha reliabilities were .70 and .71 for social sensitivity and defensiveness, respectively.

Statistical Analyses

First, descriptive statistics and intercorrelations between variables were examined. Next, I examined a mediated model in which social sensitivity and defensiveness were related to ego development both directly and indirectly through interpersonal cognition by using the maximum likelihood method in LISREL 8.70 (Jöreskog & Sörbom, 2004). I used parcels as indicators of constructs because my primary interest was in the overall structural model rather than in estimating the exact relationships among individual items and measured variables. Based on the internal consistency approach (Little, Cunningham, Shahar, & Widaman, 2002), exploratory factor analysis was employed, and the items were alternately assigned to one of three parcels for each unidimensional latent construct (i.e., social sensitivity and defensiveness). To capture interpersonal cognition, which consists of multifaceted scales, I used four subscales as the indicators for the latent construct. The WUSCT was used as the single indicator of the latent construct of ego development. I adopted three goodness-of-fit indices to evaluate the model's fit (Anderson & Gerbing, 1988): the comparative fit index (CFI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). A CFI above .95 and an RMSEA and a SRMR between .05 and .08 suggest a good model fit (Hu & Bentler, 1999).

To ensure the significance of the mediation, the Sobel test was used to assess the indirect effects of social sensitivity and defensiveness on ego development through interpersonal cognition. Finally, a multiple-group analysis was conducted to test whether adolescent gender moderated the mediation effects. A multigroup baseline model (i.e., a multigroup model with no equality constraints) was established against which subsequent models including equality constraints across

groups were compared. Next, cross-group equality constraints were placed across the data of the boys and the girls for the relationships between personality, interpersonal cognition, and ego development.

Results

The means and standard deviations for the boys and the girls are displayed in Table 1. The independent samples of the *t* tests reveal that the adolescent girls reported higher levels of interpersonal understanding, negotiation, sharing, social sensitivity, and ego development than did the boys (all *ps* < .01). In contrast, the adolescent boys reported a higher level of defensiveness than did the girls.

The intercorrelations between the variables and Cronbach's alphas are presented in Table 2. The results indicate that social sensitivity was positively correlated with four kinds of interpersonal cognition and ego development for the girls (*ps* < .01). However, for the boys, social sensitivity was positively correlated with interpersonal cognition (*ps* < .001), but not correlated with ego development. Defensiveness was negatively correlated with interpersonal understanding and meaning for the girls (*ps* < .05), but only correlated with interpersonal meaning in the same direction for the boys (*p* < .05). For both the boys and the girls, defensiveness was negatively correlated with ego development (*ps* < .01); all interpersonal cognition was positively related to ego development (*ps* < .01).

With respect to the mediation analysis, the hypothesized model suggests direct and indirect paths from social sensitivity and defensiveness to ego development, and the indirect paths were from social sensitivity and defensiveness to interpersonal cognition, and then from interpersonal cognition to ego development. The model produced significant chi-square values, $\chi^2(39, N = 616) = 117.85, p = .000$, and the other comparative indices were CFI = .97, RMSEA = .057, and

TABLE 1. Means and Standard Deviations of the Measured Variables

	Boys		Girls		<i>t</i> (<i>df</i> = 608)
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
1. Defensiveness	02.36	2.03	02.00	1.89	-2.24***
2. Social sensitivity	08.01	2.62	09.09	2.45	-5.20***
3. Interpersonal understanding	24.53	3.55	25.43	3.19	-3.22***
4. Interpersonal meaning	24.38	3.66	24.23	3.57	-0.49***
5. Interpersonal negotiation	23.57	4.01	24.41	3.53	-2.68***
6. Interpersonal sharing	24.40	3.70	25.31	3.46	-3.09***
7. Ego development	04.52	1.03	05.19	0.76	-9.02***

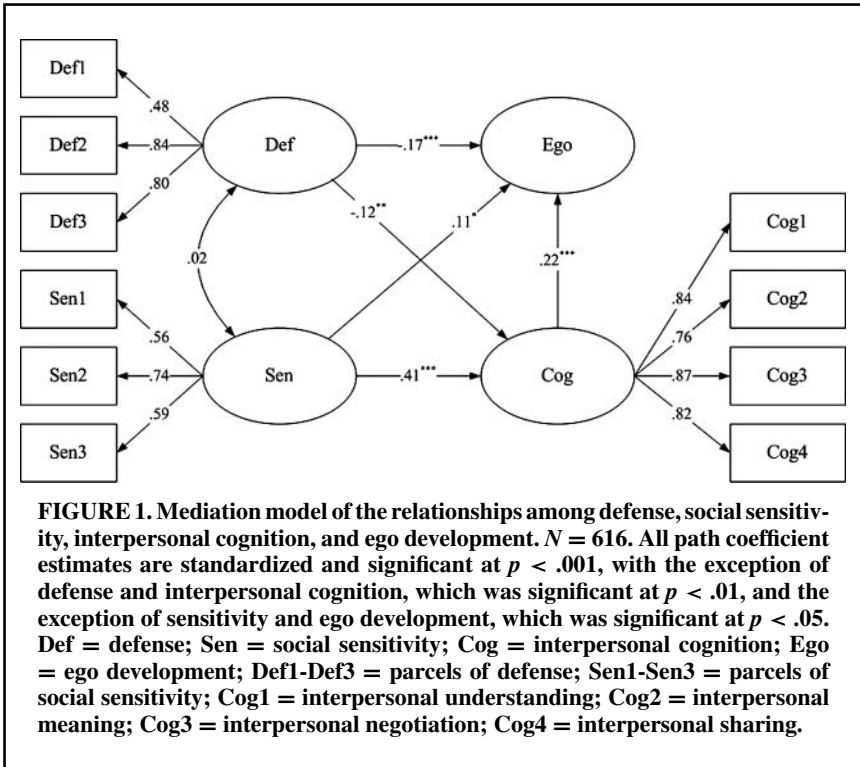
p* < .05. *p* < .01. ****p* < .001.

TABLE 2. Correlation and Cronbach's Alphas of the Measured Variables

	Cronbach's α						
	1	2	3	4	5	6	7
1. Defensiveness	.71	—	—	—	—	—	—
2. Social sensitivity	.70	-.09**	-.12**	-.16**	-.10**	-.08**	-.22**
3. Interpersonal understanding	.80	-.02**	-.24**	-.25**	-.30**	-.29**	-.16**
4. Interpersonal meaning	.80	-.13**	-.34**	-.70**	-.71**	-.65**	-.19**
5. Interpersonal negotiation	.84	-.07**	-.23**	—	-.66**	-.56**	-.12**
6. Interpersonal sharing	.80	-.02**	-.72**	-.62**	—	-.73**	-.20**
7. Ego development	—	-.17**	-.66**	-.68**	-.72**	—	-.19**
		-.08**	-.15**	-.17**	-.21**	-.21**	—

Note. Correlations for boys ($n = 271$) are presented below the diagonal, and correlations for girls ($n = 339$) above the diagonal.

* $p < .05$. ** $p < .01$.



SRMR = .033. The factor loadings on each latent variable were significant and higher than .48 ($p < .001$), supporting the convergent validity of the indicators (Anderson & Gerbing, 1988). Thus, the indicators used here appear to provide good measurements of all the latent variables.

Two nested model comparisons were conducted. I first removed the direct path from social sensitivity to ego development, but the model's fit worsened significantly, $\Delta\chi^2(1, N = 616) = 3.88, p < .05$. I then removed the direct path from defensiveness to ego development, and the model's fit worsened significantly again, $\Delta\chi^2(1, N = 616) = 11.57, p < .001$. Thus, I retained the hypothesized model as the most parsimonious model (see Figure 1).

Moreover, the significance of the mediation effect was assessed by using the Sobel test. The results indicate that the indirect path from social sensitivity to interpersonal cognition, then from interpersonal cognition to ego development, was significant ($z = 2.92, p < .05$), and the indirect path from defensiveness to interpersonal cognition, then from interpersonal cognition to ego development, was also significant ($z = 9.62, p < .001$). The overall results support the hypotheses,

suggesting that the relationships between social sensitivity and defensiveness and ego development are partially mediated by mature cognition of friendship.

To test whether the best-fitting model fitted the data of both boys and girls equally well, I performed a multigroup analysis. In the baseline model, the results show that specifications describing the mediation model were similar for the boys and the girls. Although the chi-square value was significant, $\chi^2(93, N = 616) = 195.32, p = .000$, the other comparative indices (i.e., CFI = .96, RMSEA = .60) indicated an adequate fit to the data representing both the boys and the girls. Because the main concern was to examine whether gender moderated the associations among variables, I tested for invariant path coefficients by constraining the structural paths to be equal across groups. A comparison with the baseline model was not significant, $\Delta\chi^2(5, N = 616) = 0.83, p = .98$, revealing that the structural paths between the boys and the girls were invariant.

Discussion

Although previous studies have individually identified the relationships between personality and ego development, and between cognition and ego development, the ways that personality and cognition might function together during ego development have rarely been studied. The present study proposed a personality-cognition model of ego development within the interpersonal context of adolescence, and examines whether interpersonal cognition mediates the relationships between interpersonal sensitivity and defense and ego development. The findings of the study support the hypothesized model, suggesting that interpersonal cognition partially mediates the relationships between social sensitivity and defensiveness and ego development, and that this model explains equally well for both boys and girls.

The results of the mediating effect indicate that different personality characteristics are associated with different levels of interpersonal cognition. A socially sensitive adolescent who is prone to social involvement is able to accurately perceive others' feelings, motives, and behaviors, and also has adequate conflict resolution skills to maintain quality relationships (Hall & Bernieri, 2001). A positive relationship between social sensitivity and interpersonal cognition reveals that adolescents with this disposition must have developed a good understanding of the nature of friendship, grasped the balance between intimacy and autonomy in a friendship, and acknowledged the meanings of friendship. These recognitions involve a complex differentiation of the self and others in relationships, and lead the adolescents who acquire them toward a higher level of ego development. In contrast, a negative association between defensiveness and interpersonal cognition suggests that adolescents who are inclined to be defensive in their interactions with friends are less likely to display well-developed interpersonal cognition. According to the interpersonal defensive theory, defensive behavior is motivated by a desire to avoid unwanted or feared outcomes such as negative evaluation or judgment by others (Westerman, 1998; Westerman & Prieto, 2006). When individuals

behave defensively to avoid unwanted outcomes, they might deny themselves a variety of experiences, have various reactions (e.g., shame, insecurity), and have concerns about themselves and their relationships with others. They might even deny themselves a general awareness of others' feelings and motives. The distinct patterns of association between sensitivity and interpersonal cognition and between defense and interpersonal cognition also provide support for Shoda and Mischel's (1996) CAPS theory, in which personality has a distinct association with cognitive-affective units that characterize individual differences.

The present model also indicates that social sensitivity and defense have direct paths to ego development. The literature has indicated two conceptions of defense as it relates to ego development: an intrapsychic mechanism and an interpersonal interaction process. I think that the indirect path from defense to interpersonal cognition, then interpersonal cognition to ego development, indicates an interpersonal interaction process, whereas the direct path demonstrates the function of an intrapsychic mechanism. For the latter defense mechanism, defensiveness measured in this study reflects a denial of reality (denial) or attribution of hostile feelings and intentions toward others (projection). The literature indicates that defenses of denial and projection are regarded as less mature defense mechanism, and that the use of immature defensive behaviors is negatively correlated with an individual's ego progression (Cramer, 1999). Regarding the direct path from social sensitivity to ego development, other factors or mechanisms could also affect the relationship. Previous studies have revealed that empathy, affiliation, tolerance, and openness to new experiences are related to both interpersonal sensitivity and ego development (Hall et al., 2009; John et al., 1998). The notions of empathy, affiliation, and tolerance are relevant to the capacities to share, experience the feelings of another, appreciate diversity or respect others' opinions, and be friendly, social, and skillful in dealing with people. These concepts are similar to the indicators of interpersonal cognition measured in this study, which included interpersonal understanding, sharing, negotiation, and personal meaning. Additionally, openness to new experiences refers to an individual's propensity to be open to a variety of novel ideas, values, and experiences (Costa & McCrae, 1992). I speculate that openness to experience might be another mechanism associated with ego development. People who are socially sensitive might also be more likely to expose themselves to new interpersonal situations and to reflect on these experiences. If so, these experiences would no doubt also expand these individuals' opportunities for personal development and growth.

I believe that the present empirically supported model makes a contribution to the literature by integrating Shoda and Mischel's (1996) theory of a cognitive-affective personality system with Loewinger's (1976) ego development theory. Adolescents who are socially sensitive are associated with well-developed interpersonal cognition, whereas those who behave defensively are negatively related to interpersonal cognition. Mature interpersonal cognition is positively correlated with ego development. To my knowledge, this is the first study to reveal the role of

interpersonal cognition in the relationship between social sensitivity, defensiveness, and ego development. Nevertheless, because the sample in the present study consisted of senior high school students in Taiwan, it is important to consider whether the process identified here holds true for other populations such as adults or individuals from different cultural backgrounds. Adults' interaction patterns in friendship, for example, might differ from those of adolescents. Also, intimate relationships may have a greater influence on ego development than friendships. Research has indicated that marital satisfaction is related to ego development (Helson & Wink, 1987). In addition, sensitivity and defense were measured by the CPAI-A, which has been recognized as accurately capturing Chinese personality characteristics. Collectivist cultures strongly emphasize relationship harmony, and people from collectivist cultures are more sensitive to relational contexts than people from individualistic cultures (Suwartono, Prawasti, & Mullet, 2007). Therefore, the model validated in this study should be tested in populations with more diverse age groups and cultural backgrounds. Furthermore, although the present study provides support for the personality-cognition-ego development linkage, it is limited to the interpersonal context. The application of this linkage to a broader conceptualization of personality and cognition requires further investigation.

Another concern in this study is that only immature defenses of personality were measured. However, researchers have distinguished between mature and immature defenses and have reported that mature defenses such as altruism, suppression, and intellectualization are positively associated with ego development (Levit, 1993), whereas mature defenses such as humor are positively correlated with a warm-agreeable interpersonal style (Zeigler-Hill & Pratt, 2007). Also, Cramer (1999) reported that the employment of defense strategies varies according to ego status. Mature defenses are more likely to be observed with higher ego statuses, whereas immature defenses are more likely to be seen with lower ego statuses. Future studies should include both defense tendencies in the model to provide detailed information about the process of ego development within the personality-cognition system.

Finally, this study examined whether interpersonal cognition has a mediating effect on the relationship between personality and ego development, and whether this effect is compatible with a causal relationship. However, I am not yet able to draw causal conclusions about the relationships in the model because the data collection design was cross-sectional. Experimental methods and longitudinal designs must be used to further determine the direction of the proposed association.

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AUTHOR NOTES

Yih-Lan Liu is a Professor at the Institute of Education/Center for Teacher Education of the National Chiao Tung University, Taiwan. Her research interests include parent-adolescent interaction and social development of adolescents.

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