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Socio-demographic and family predictors of moral competence in Chinese adolescents in Hong Kong: a six-wave longitudinal study

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Abstract: This six-wave longitudinal study in Project P.A.T.H.S. examined the growth trajectories and predictors of moral competence in Chinese adolescents in Hong Kong. Linear mixed models utilizing individual growth curves were used to analyze the initial status and rate of change of moral competence with reference to gender, economic disadvantage, family intactness, family functioning and parent-child subsystem quality. Results showed that adolescent moral competence increased across 6 years. Female adolescents had higher initial levels of moral competence than that of male adolescents. Adolescents from well-functioning families had higher initial levels of moral competence but slower growth of moral competence than did those from families with lower family functioning. Adolescents with higher mother-child subsystem quality had higher initial levels of moral competence but slower growth of moral competence than did those with relatively lower mother-child subsystem quality. Finally, adolescents with higher father-child subsystem quality had higher initial levels of moral competence than those with relatively lower father-child subsystem quality.

Keywords: Chinese adolescents; family predictors; longitudinal research; moral competence; positive youth development.

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Introduction

Moral competence is an important indicator of holistic development in adolescence. Catalano et al. stated that "moral competence is youth's ability to assess and respond to the ethical, affective, or social-justice dimensions of a situation" [1]. Moral competence is also embedded in the virtues of human development [2] which refers to "the knowledge, ability, and motivation to pursue and to do good effectively" [2]. Moral competence is considered as one of the five essential psychosocial competencies in positive youth development, together with social, emotional, cognitive, and behavioral competencies [1]. In this study, "moral competence" refers to "the affective orientation to perform altruistic behaviors towards others and the ability to judge moral issues logically, consistently, and at an advanced level of development" [3]. The study examined the developmental trajectory (from Grade 7 to Grade 12) of moral competence in the individual, familial and social contexts of Chinese adolescents in Hong Kong. This concept was measured by the self-perception of adolescents' moral orientation and moral judgment in this study.

As a key part of the socialization process, adolescent moral development is influenced by personal and family factors [4, 5]. Eisenberg et al. [4] conducted a series of longitudinal studies on adolescent development focusing on prosocial functioning and moral reasoning, but the studies were mainly confined to different types of moral reasoning that adolescents used in a particular moral dilemma situation. Besides, few studies examined adolescents' perceptions of their own moral competence using longitudinal data. Furthermore, moral competence may be associated with other factors, such as biological, psychological, social, cultural, ecological correlates across time [6]. However, few empirical studies have examined the status and patterns of change of adolescent moral competence with reference to different individual, family and social contextual factors.

The concept of moral competence has been commonly incorporated in some youth enhancement programs. In Hong Kong, moral competence is one of the 15 key positive

youth development constructs which is assessed by the Chinese positive youth development scale [7–9]. Previous research of the project demonstrated that moral competence, together with other positive youth development constructs, had positive impacts on adolescent development, especially in their prosocial norms and behaviors [10, 11].

Research of adolescent moral development in the West showed that morality of adolescents developed across time [4, 5]. In their longitudinal studies on prosocial disposition from mid-adolescent to early adulthood, Eisenberg et al. [4] found that perspective taking and moral reasoning increased in maturity. On the other hand, empirical studies on moral development in the Chinese societies also showed positive development of moral competence in adolescent years [12–14]. In particular, positive parent-child and sibling relationships promoted adolescent moral development – adolescents gradually acquired and developed a mature understanding of moral codes (e.g. showing filial piety to one's parents) over time [13, 14].

Regarding gender and moral competence, there are no conclusive findings in the scientific literature. Some scholars provided research evidence to show that girls had higher prosocial moral orientation than did boys, but there was no significant gender differences in their overall moral judgment [12]. Eisenberg et al. [4] also used their longitudinal findings to show that girls were better than boys in some types of moral reasoning (e.g. other-oriented thinking and prosocial norms).

The effect of economic disadvantage on adolescent moral competence and moral development is unclear as there are limited studies in the field. In terms of family socioeconomic status, Theokas and Lerner [15] showed a positive correlation between household income and positive youth development outcomes based on their study on fifth graders in the US. Hyde et al. [16] also found that the negative early childhood experience (e.g. parental rejection) contributed to subsequent moral disengagement and antisocial behavior among adolescent boys growing up in low-income families. However, few studies had strong evidence to support the negative association of familial economic disadvantage and moral development.

Besides the impact of economic disadvantage on moral competence, the influence of non-intact family (e.g. parental divorce) on adolescent morality was also examined in this study. Some longitudinal research showed that adolescents from divorced/separate families did not differ in their self-reported feeling of shame and guilt (e.g. indicators of morality) when compared to those from intact families [17]. Nevertheless, previous studies on the Project P.A.T.H.S showed that the factors of non-intact family and poor family had negative correlations with adolescent's risk behavior and delinquency [11, 18]. In short, there is a dearth of research evidence demonstrating that parental marital disruption is harmful to adolescent moral development. Hence, it is worthy to further explore the longitudinal effects of family intactness on adolescent moral competence.

In addition to family economic disadvantage and family intactness, family functioning (e.g. cohesion and communication among family members) positively predicted adolescent external morality, especially in their moral thoughts and moral decision-making [19]. In their longitudinal studies on delinquency trajectories in mid-adolescence, Wiesner and Windle [20] stated that unsupportive family environments (e.g. perceived insufficient emotional and moral support provided by family) predicted the offensive behavior of the adolescents. Although this study did not directly address the impact of family support on adolescent moral competence, it provides research evidence to suggest that family functioning is an important predictor of adolescent moral development.

Besides the aforementioned socio-demographic and family predictors of adolescent moral competence, the impact of the parent-child subsystem on adolescent moral competence is also worth noting [21, 22]. Most studies on the subsystem of parent-child focused on parental warmth, parental monitoring, and parent-child interaction. Smetana et al. [23] reviewed the cross-sectional and longitudinal studies on adolescent development in the family context. They showed that more family interaction resulted in more mature moral reasoning and parents had a long-term impact on children's moral values. Some scholars argued that better parent-child relations and paternal supervision predicted better development of social competence in children [24] as well as their empathy and prosocial behavior [25]. Authoritative parenting (e.g. better support and demands for appropriate behavior and control) was linked to a higher level of moral judgment in adolescence [26].

Given the paucity of empirical studies examining parent-child subsystem quality which contains multiple dimensions of the parent-child relational quality, Shek and Law [22, 27] developed and validated two assessment tools to assess father-child subsystem quality and mother-child subsystem quality (including behavior control, psychological control, and parent-child quality). From the previous studies, father-child subsystem quality and mother-child subsystem quality (except mother's

behavior control) significantly predicted Internet addiction behavior in adolescents [22]. Paternal and maternal parent-child subsystem quality also had significant correlation with psychosocial wellbeing, substance abuse, and delinquency of adolescents in poor families [28]. Therefore, it was expected these two family variables would have correlation with the adolescent moral competence.

Research questions and hypotheses

Using six waves of data, we estimated the growth curves of adolescent moral competence and explored whether gender, economic disadvantage, family intactness, family functioning, father-child subsystem quality, and mother-child subsystem quality were related to the initial status as well as patterns of change of moral competence in adolescence. Based on the aforementioned literature review, the main questions and hypotheses were as follows:

a. Does adolescent moral competence change over adolescent years? Based on previous research [4, 5, 12–14, 26], it was predicted that adolescent moral competence would increase throughout the adolescent years (Hypothesis 1).
b. Is gender related to adolescent moral competence? Based on previous research [4, 12], it was predicted that adolescent girls would have higher moral competence than adolescent boys (Hypothesis 2).
c. Is economic disadvantage related to adolescent moral competence? With reference to previous research findings [15, 16], our prediction was that poor adolescents would have a lower level of moral competence (Hypothesis 3).
d. Is family intactness related to adolescent moral competence? Following the previous studies [11, 17, 18], we expected that adolescents growing up in non-intact families would have lower moral competence than those growing up in intact families (Hypothesis 4).
e. Is family functioning related to adolescent moral competence? Based on the previous research [19, 20], it was predicted that family functioning would be positively related to adolescent moral competence (Hypothesis 5).
f. Is parent-child subsystem quality related to adolescent moral competence? Based on the previous research [21–23, 26–28], it was predicted that father-child subsystem quality and mother-child subsystem quality would be positively related to adolescent moral competence (Hypothesis 6 and Hypothesis 7, respectively).

Methods

This longitudinal research project was implemented in the 2009/2010 academic year which lasted for 6 years with the collection of six waves of data. More details of this research project can be seen in Shek and Ma's paper [29]. A total of 3328 secondary school students (Grade 7) participated in Wave 1. They were invited to complete the same questionnaire assessing their psychosocial adjustment and family processes in all 6 years. In Wave 6, the participants studied in Grade 12 (the final year of their secondary school study). The attrition rates of the participants ranged from 12.7% to 28.3% from Wave 2 to Wave 6. School, parent and student consent was obtained in prior to the study. All collected questionnaires and data were analyzed by a team of well-trained researchers.

Instruments

Moral competence refers to how adolescents perceive their competence to judge on what is right or wrong, to conduct moral behavior, and to respect the rules, laws, and social justice [3, 7, 8]. It is one of the 15 positive youth development constructs measured by the Chinese positive youth development scale [8]. Although six questions were intrinsic to the original scale, three questions were used in this study in a six-point Likert-type scale: (1) "I have high moral expectation about my behavior"; (2) "I will fulfill my promise"; (3) "I have the habit of self-evaluation". Moral competence was calculated by the average score of these three items.

Economic disadvantage, family intactness, and family functioning: Economic disadvantage was assessed by one question concerning whether the participant's family had received comprehensive social security assistance (CSSA) in Hong Kong. If the adolescent indicated that his/her family had received CSSA, then he/she was considered as having economic disadvantage (a relatively poor family).

Family intactness refers to the reported parental marital status (1=divorced but not married, 2=separated but not remarried, 3=first marriage, 4=second or subsequent marriage, 5=others). Only the participants with parents in their first marriage were considered as having family intactness.

Family functioning was measured by the Chinese family assessment instrument (CFAI) with three subscales: (1) mutuality (mutual support, love, and concerns among family members), (2) communication (frequency and nature of interaction among family member), and (3) conflicts and harmony (the presence of conflicts and harmonious behavior in family). The scale had been developed and validated in previous studies [30, 31]. With scores in the dimension of conflicts and harmony reverse keyed, family functioning was indicated by a mean score of all items, with a higher score indicating a more supportive family environment.

Parental-child subsystem quality: In this study, father-child subsystem quality and mother-child subsystem quality were regarded as two separate measures to assess differences between paternal and maternal parenting in adolescent moral development. These two variables share the same set of questions (totally 17 items, in a five-point Likert-type scale) measuring father and mother separately. Taking father-child subsystem quality as example, the measure includes

three components: (1) father's behavioral control (seven items), (2) father's psychological control (four items in reversed rating), and (3) the father-child relational quality (six items). The psychometric properties of this scale were validated through exploratory and confirmatory factor analyses [22, 27].

Data analyses

The data were analyzed by the Statistical Package for the Social Sciences (SPSS) [32]. Descriptive analyses were conducted to calculate the mean scores of moral competence, family functioning, father-child subsystem quality, and mother-child subsystem quality in all six waves. Reliabilities of these variables across six waves were also examined. Next, correlations of the Wave 1 socio-demographic variables, family functioning, father-child subsystem quality, and mother-child subsystem quality, and the moral competence (Wave 1 to Wave 6) were examined.

Furthermore, linear mixed models (LMM) were conducted to test and compare the unconditional mean model, unconditional growth model, and conditional growth model, respectively. Unconditional mean model (Model 1) was used to test the within-individual variance without adding predictors. The unconditional growth model (Model 2) was then tested with "Time" as the only level-1 predictor. In the conditional growth models (Model 3 and Model 4), socio-demographic factors were first added as the level-2 predictors in the linear growth curve model of Model 3. In Model 4, family functioning, father-child subsystem quality, and mother-child subsystem quality were then added as the level-2 predictors with the initial status and socio-demographic factors controlled. Based on the results of LMM, the growth trajectory of moral competence was plotted based on Model 2 (see Figure 1). Besides, prototypical plots of moral competence in terms of the above independent variables were also generated based on Model 4 (see Figures 2 and 3).

Results

In Table 1, results showed that the scales of moral competence, family functioning, father-child subsystem quality, and mother-child subsystem quality were reliable, with the α-values above 0.70 in all cases. In Table 2, Pearson's correlation showed that: (1) there were significant correlations of moral competence across six waves; (2) moral competence was negatively related to gender (i.e. female adolescents had higher moral competence than male adolescents) but positively related to family functioning, father-child subsystem quality, and mother-child subsystem quality across six waves (i.e. higher family functioning and parent-child subsystem quality were related to higher level of moral competence). These findings supported the hypotheses posed at the beginning of the study.

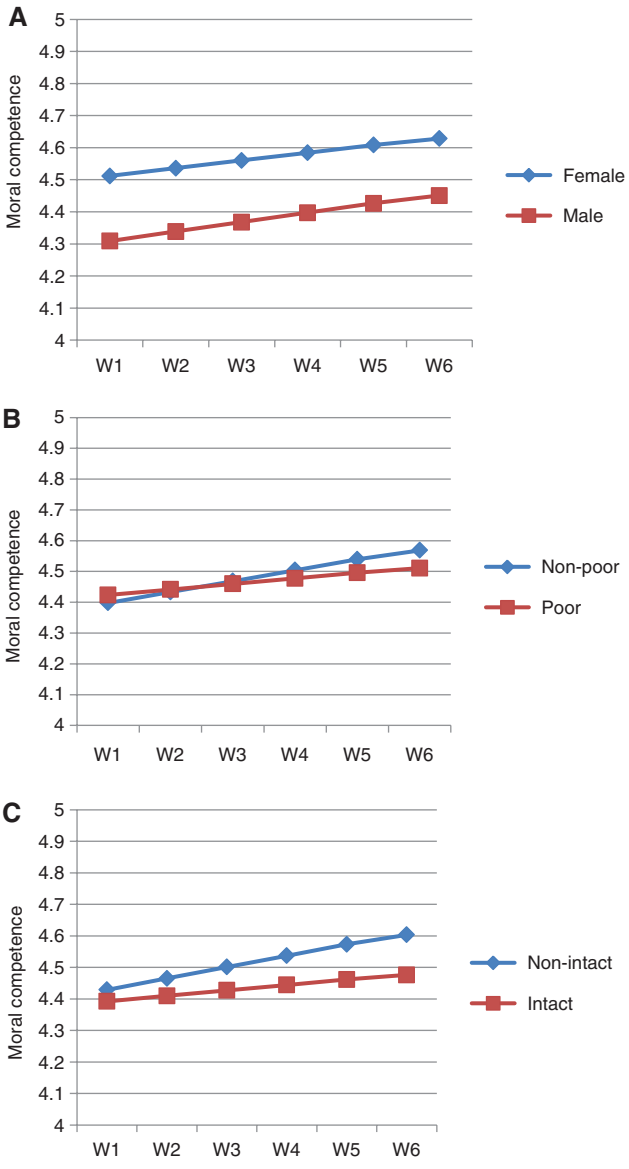

Figure 2: Growth trajectories by socio-demographic variables. (A) Gender, (B) economic disadvantage, and (C) family intactness. The figures were plotted based on Model 4.

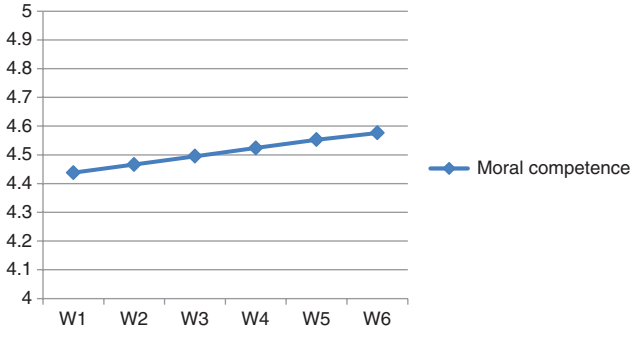

Figure 1: Growth trajectory of the overall sample. The figure was based on Model 2.

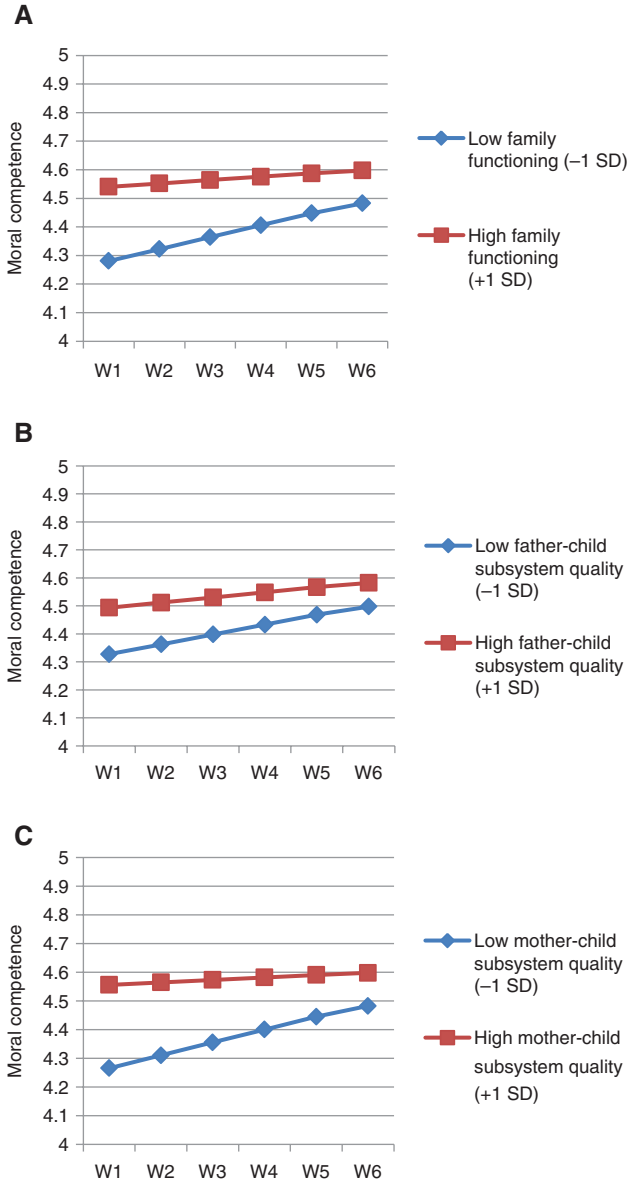

Figure 3: Growth trajectories by family functioning, father-child subsystem quality, and mother-child subsystem quality. (A) Family functioning, (B) father-child subsystem quality, and (C) mother-child subsystem quality. The figures were plotted based on Model 4. High level indicates 1 SD higher than the mean value; low level indicates 1 SD lower than the mean value.

To further examine the prediction of different variables on moral competence, LMM analyses were conducted. Firstly, the unconditional mean model (Model 1, in Table 3) was tested to identify the sources of variance of adolescent moral competence using intra-class correlation coefficient (ICC) as an indicator [33]. As calculated, ICC had a value of 0.4752 (47.52% of total variance of moral competence could be explained by inter-individual variables), which suggested that it was necessary to further examine the relationships between moral competence and different level-2 predictors.

Next, the unconditional growth model (Model 2, in Table 3) was tested which showed a better-fit than the unconditional mean model (Model 1), [$\Delta\chi^2$ (3)=396.804; p<0.001; ΔAIC=390.804; ΔBIC=367.695]. The initial level of moral competence was high (γ_{00}=4.375, p<0.001). The random coefficient of time (level-1 predictor) in the linear slope (γ_{10}=0.029, p<0.001) showed there was a 0.029 mean unit of increase of moral competence in each year. Based on Model 2, the growth trajectory of moral competence was plotted, and it also showed an increase trend in all 6 years (Figure 1). Therefore, Hypothesis 1 was supported. In terms of random effect, 14.3% between-individual variance of moral competence could be explained by time effect (level-1 predictor). In addition, the between-subject variances were both significant (intercept u_{0j}=0.459, p<0.001; slope u_{1j}=0.013, p<0.001), which indicated the possibility of higher-level inter-personal predictors in explaining the variances in intercept and linear growth curve.

Finally, the conditional growth models (Model 3 and Model 4, in Table 4) were examined. In Model 3, three socio-demographic variables (gender, economic disadvantage, family intactness) were first tested as the level-2 predictors in the linear growth curves of moral competence over six waves. Model 3 had a model fitted better than Model 2 [$\Delta\chi^2$ (6)=5401.131; p<0.001; ΔAIC=5397.131; ΔBIC=5383.710]. Then, in Model 4, family functioning, father-child subsystem quality, and mother-child subsystem quality were added as the level-2 predictors with the initial status and socio-demographic predictors controlled. Results in Model 4 showed a better fit than Model 3 [$\Delta\chi^2$ (6)=6837.355; p<0.001; ΔAIC=6825.355; ΔBIC=6784.378]. Therefore, Model 4 was finally selected as the model to explain the level-2 predictors on initial status and rate of change in moral competence.

In Model 4, the random coefficient of gender was significant in initial status (γ_{01}=−0.101, p<0.001) but not in the linear slope (γ_{11}=0.003), which meant that female adolescents had a higher level of moral competence than male adolescents in Wave 1, but female adolescents did not have a significantly faster growth of moral competence than male adolescents. Therefore, Hypothesis 2 was supported. Another two socio-demographic variables (economic disadvantage and family intactness) were not significantly associated with the initial status and rate of change of moral competence. In addition, comparison of the linear growth curves of economic disadvantage (poor versus non-poor students) and family intactness (intact

Table 1: Descriptive statistics of key variables and internal consistency coefficients of scales (Wave 1–6).

	Mean (SD)						Reliability					
	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6
Family functioning	3.73 (0.81)	3.68 (0.81)	3.71 (0.79)	3.70 (0.76)	3.68 (0.77)	3.69 (0.75)	0.93	0.96	0.93	0.96	0.96	0.96
Father-child subsystem quality	2.68 (0.52)	2.65 (0.52)	2.64 (0.50)	2.63 (0.49)	2.61 (0.48)	2.61 (0.48)	0.87	0.88	0.88	0.89	0.88	0.89
Mother-child subsystem quality	2.98 (0.51)	2.93 (0.47)	2.90 (0.47)	2.90 (0.44)	2.88 (0.44)	2.87 (0.43)	0.88	0.89	0.89	0.88	0.88	0.89
Moral competence												
Overall	4.37 (0.91)	4.41 (0.85)	4.46 (0.81)	4.49 (0.80)	4.50 (0.75)	4.55 (0.74)	0.73	0.75	0.74	0.75	0.70	0.70
Male	4.27 (0.95)	4.32 (0.90)	4.38 (0.86)	4.39 (0.88)	4.42 (0.81)	4.48 (0.80)	–	–	–	–	–	–
Female	4.48 (0.84)	4.51 (0.78)	4.53 (0.75)	4.59 (0.69)	4.58 (0.68)	4.61 (0.66)	–	–	–	–	–	–
Not receiving CSSA	4.31 (0.99)	4.43 (0.84)	4.49 (0.80)	4.52 (0.78)	4.51 (0.74)	4.56 (0.73)	–	–	–	–	–	–
Receiving CSSA	4.38 (0.89)	4.37 (0.87)	4.39 (0.80)	4.45 (0.74)	4.33 (0.69)	4.58 (0.73)	–	–	–	–	–	–
Intact families	4.40 (0.90)	4.43 (0.84)	4.47 (0.79)	4.50 (0.79)	4.52 (0.74)	4.56 (0.74)	–	–	–	–	–	–
Non-intact families	4.21 (0.92)	4.35 (0.86)	4.33 (0.91)	4.45 (0.84)	4.40 (0.77)	4.50 (0.71)	–	–	–	–	–	–

versus non-intact students), there were merely minor differences between them (see Figure 2). Therefore, Hypothesis 3 and 4 were not supported.

Family functioning was positively associated with the initial status of moral competence (γ_{06}=0.130, p<0.001) but negatively related with the rate of change (γ_{16}=−0.015, p<0.05). The findings suggested that adolescents from families with better family functioning had a high initial level of moral competence but slower growth rate than that of who came from families with relatively poorer family functioning. Father-child subsystem quality was positively associated with the initial status of moral competence (γ_{04}=0.083, p<0.001). It showed adolescents with higher perceived paternal parenting quality had a higher initial level of moral competence than did those with lower quality of paternal parenting. Mother-child subsystem quality was positively associated with the initial status of moral competence (γ_{05}=0.145, p<0.001) but negatively related to the rate of change (γ_{15}=−0.018, p<0.001). The findings suggested that adolescents with higher perceived parenting quality of the mothers had a higher initial level of moral competence but slower growth rate than those with lower one. In terms of the random effects, 25.1% of the total between-individual variance in the intercept could be explained by the level-2 predictors, and 15.4% of the total variance in growth rate can be explained by the level-2 predictors.

The above results on the predictors in Model 4 were further elaborated by the prototypical plots (in Figure 3). In Figure 3, adolescents with higher family functioning, father-child subsystem quality, and mother-child subsystem quality had higher mean scores than did those with relatively lower family functioning, father-child subsystem quality, and mother-child subsystem quality across six waves. Adolescents with better perceived family functioning and higher father-child as well as mother-child subsystem quality were stable in the development of moral competence comparing to the ones who had relatively poorer family functioning and lower father-child/mother-child subsystem quality. Together with the findings based on Pearson's correlation analyses (in Table 2), family functioning and parent-child relational qualities could positively predict the initial level of adolescent moral competence, which provided support for Hypotheses 5, 6 and 7.

Discussion

A review of the literature shows that there are few longitudinal studies examining the development of moral

Table 2: Correlations among variables.

Variables	MC	SMC	TMC	FMC	GMC	QMC
MC	1					
SMC	0.487[g]	1				
TMC	0.419[g]	0.533[g]	1			
FMC	0.391[g]	0.476[g]	0.533[g]	1		
GMC	0.370[g]	0.432[g]	0.474[g]	0.554[g]	1	
QMC	0.295[g]	0.382[g]	0.446[g]	0.479[g]	0.530[g]	1
Gender[a]	−0.117[g]	−0.114[g]	−0.087[g]	−0.130[g]	−0.107[g]	−0.086[g]
Economic disadvantage[b]	−0.023	−0.025	−0.034	−0.033	−0.043[h]	−0.026
Family intactness[c]	0.079[g]	0.044[h]	0.037	0.018	0.041[h]	0.024
Father-child subsystem quality[d]	0.321[g]	0.215[g]	0.186[g]	0.198[g]	0.198[g]	0.143[g]
Mother-child subsystem[e] quality	0.350[g]	0.281[g]	0.230[g]	0.187[g]	0.211[g]	0.158[g]
Family functioning[f]	0.353[g]	0.272[g]	0.224[g]	0.195[g]	0.207[g]	0.163[g]

MC, Moral competence at Wave 1; SMC, moral competence at Wave 2; TMC, moral competence at Wave 3; FMC, moral competence at Wave 4; GMC, moral competence at Wave 5; QMC, moral competence at Wave 6. [a]Male=1, female=−1; [b]receiving CSSA=1, not receiving CSSA=−1; [c]intact=1, non-Intact=−1; [d]father-child subsystem quality at Wave 1; [e]mother-child subsystem quality at Wave 1; [f]family functioning at Wave 1; [g]$p<0.01$; [h]$p<0.05$.

Table 3: Results of LMM models with level-1 predictor.

		Model 1		Model 2	
		Estimate	SE	Estimate	SE
Fixed effects					
Intercept	β_{0j}				
Intercept	γ_{00}	4.435[a]	0.011	4.375[a]	0.014
Linear slope	β_{1j}				
Time	γ_{10}			0.029[a]	0.003
Random effects					
Level-1 (within)					
Residual	r_{ij}	0.360[a]	0.004	0.317[a]	0.004
Level-2 (between)					
Intercept	u_{0j}	0.326[a]	0.010	0.459[a]	0.016
Time	u_{1j}			0.013[a]	0.001
Fit statistics					
Deviance		35218.865		34822.061	
AIC		35224.865		34834.061	
BIC		35247.975		34880.280	
df		3		6	

Model 1, Unconditional mean model; Model 2, unconditional growth model. [a]$p<0.001$, [b]$p<0.01$.

competence in Chinese adolescents. There are several unique characteristics of the study. First, data were collected over 6 years to understand adolescent moral competence. In fact, this is the first known scientific study collecting six waves of data in different Chinese contexts. Second, a large sample of Chinese students was randomly selected to enhance the generalizability of the findings. Third, validated instruments were used in the study. Fourth, individual growth curve models were constructed and tested in the study. Finally, a wide range of developmental outcome indicators were included in the study.

This study provides a rich picture on the normative profile of adolescent moral competence across time in Hong Kong. It shows that adolescent moral competence was related to gender, family functioning as well as parent-child relational quality. Several interesting observations can be highlighted from the present study. First, gender was significantly related to initial status of moral competence, with female adolescents showing a higher initial level of moral competence than male adolescents. However, gender differences were not found in the developmental trajectories. Second, good perceived family functioning and quality of parental/maternal parenting showed a significant impact on the growth trajectory of adolescent moral competence across time. These findings are generally consistent with the findings in the scientific literature.

The present findings showed that mother-child subsystem quality had a significant effect on the growth trajectory of moral competence in adolescence. It echoes the previous findings reported by Shek et al. [18, 22] that adolescents had a closer relationship with mother, although mother had more behavioral and psychological control on their children. On the other hand, father-child subsystem quality could be considered as equally or even more influential than mother-child subsystem quality in adolescent's healthy development because of the patriarchal power of fathers (e.g. control family resource, decision-making) in the Chinese culture [22, 34, 35]. Although the growth rates of moral competence in adolescents with lower parent-child relational quality were faster than those experienced higher parent-child

Table 4: Results of LMM models with level-2 predictors.

		Model 3		Model 4	
		Estimate	SE	Estimate	SE
Fixed effects					
Intercept	β_{0j}				
Intercept	γ_{00}	4.329[d]	0.029	4.41[d]	0.032
Gender[a]	γ_{01}	−0.107[d]	0.015	−0.101[d]	0.016
Economic disadvantage[b]	γ_{02}	−0.008	0.030	0.013	0.033
Family intactness[c]	γ_{03}	0.069[e]	0.023	−0.018	0.025
Father-child subsystem quality	γ_{04}			0.083[d]	0.020
Mother-child subsystem quality	γ_{05}			0.145[d]	0.020
Family functioning	γ_{06}			0.130[d]	0.022
Linear slope	β_{1j}				
Intercept	γ_{10}	0.032[d]	0.007	0.027[e]	0.009
Gender[a]	γ_{11}	0.005	0.004	0.003	0.004
Economic disadvantage[b]	γ_{12}	−0.007	0.008	−0.009	0.009
Family intactness[c]	γ_{13}	−0.015[f]	0.006	−0.009	0.006
Father-child subsystem quality	γ_{14}			−0.008	0.005
Mother-child subsystem quality	γ_{15}			−0.018[d]	0.005
Family functioning	γ_{16}			−0.015[f]	0.006
Random effects					
Level-1 (within)					
Residual	r_{ij}	0.314[d]	0.005	0.305[d]	0.005
Level-2 (between)					
Intercept	u_{0j}	0.443[d]	0.017	0.344[d]	0.016
Time	u_{1j}	0.013[d]	0.001	0.011[d]	0.001
Fit statistics					
Deviance		29267.449		22430.094	
AIC		29291.449		22466.094	
BIC		29381.902		22597.524	
df		12		18	

Model 3, conditional growth curve model (only with socio-demographic variables); Model 4, conditional growth curve model (adding family correlates). [a]Male=1, female=−1; [b]receiving CSSA=1, not receiving CSSA=−1; [c]intact=1, non-intact=−1; [d]$p<0.001$; [e]$p<0.01$; [f]$p<0.05$.

relational quality, the absolute level of moral competence was still higher in those with higher parent-child relational quality. The findings of the study provide good support for this claim that family plays an important role in the development of moral competence in Chinese adolescents.

The present findings did not provide support for the relationship between demographic family variables (family intactness and family socio-economic status) and adolescent moral competence. There are two possible explanations for this observation. First, although parental divorce could be detrimental to children's healthy development, such negative outcomes may be offset by the effects such as good child-rearing quality of divorced parents and adolescents' own coping with divorce and their social competence [36]. As such, future studies should be conducted to examine such possibilities. Second, as societal acceptance of poverty and non-intact families has become greater, the detrimental effect of such family structural characteristics on adolescent development may become less. In future studies, it is suggested that family processes in families experiencing economic disadvantage and non-intactness should be investigated to further understand how family process moderates the effects of economic disadvantage and family intactness on adolescent development of moral competence.

Although the present study is pioneer in nature, it has several limitations. First, as only adolescent-report of moral competence was assessed, it should be helpful if other measures using reports of significant others are included. Second, as only a few items were used to measure moral competence, more items and more dimensions of the concept should be added in future. Third, future studies may consider adding other social and ecological predictors in the model, such as one's religious beliefs, identification with community norms, peer influence [26], role modeling of siblings [14], as well as school education and social media. In addition, father as a role

model of morality and the role of father-child interaction in adolescent healthy development should also be further explored. Despite the limitations, the findings of this study suggests that more policy and social service initiatives should be considered to promote adolescent moral development. For example, in the Project P.A.T.H.S. [37, 38], positive youth development programs have been shown to promote development in adolescents, including moral competence [39].

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