

## BRIEF REPORT

# Perspective Taking and Empathic Concern in Adolescence: Gender Differences in Developmental Changes

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Empathy is an important social skill and is believed to play an essential role in moral development (Hoffman, 2000). In the present longitudinal study, the authors investigated adolescents' development of perspective taking and empathic concern from age 13 to 18 years (mean age at Wave 1 = 13 years,  $SD = 0.46$ ) and examined its association with pubertal status. Adolescents (283 boys, 214 girls) reported for 6 consecutive years on their dispositional perspective taking and empathic concern and for 4 consecutive years on pubertal status. Latent growth curve modeling revealed gender differences in levels and developmental trends. Gender differences in perspective taking emerged during adolescence, with girls' increases being steeper than those of the boys. Girls also showed higher levels of empathic concern than did boys. Whereas girls' empathic concern remained stable across adolescence, boys showed a decrease from early to middle adolescence with a rebound to the initial level thereafter. Boys who were physically more mature also reported lower empathic concern than did their less physically developed peers. The current study supports theoretical notions that perspective taking develops during adolescence as a result of cognitive development. Moreover, the results suggest that pubertal maturation plays a role in boys' development of empathic concern.

*Keywords:* empathy, development, puberty, gender differences, adolescence

Empathy is a fundamental social skill that underlies important capabilities and behaviors and plays a pivotal role in moral development and prosocial behavior (Hoffman, 2000). Adolescence is an important period for empathy development. Cognitive and relational changes can be expected to impact adolescents' abilities

or tendencies to take others' perspectives and to experience feelings of concern. Adolescence is also marked by rapid physical changes, and empathy development might undergo a temporary decline that coincides with puberty (Blakemore & Choudhury, 2006). In addition, girls often report higher levels of empathy than do boys (e.g., Eisenberg & Lennon, 1983), and there is some evidence suggesting that boys and girls diverge in their tendency to empathize with others as they move through adolescence (Fabes, Carlo, Kupanoff, & Laible, 1999). As of yet, there has been little longitudinal research on gender differences in empathy development during adolescence, and findings are inconsistent (e.g., Davis & Franzoi, 1991; Eisenberg, Cumberland, Guthrie, Murphy, & Shepard, 2005). Further, due to the different age ranges of previous longitudinal studies, it is difficult to fully delineate developmental patterns in empathy across adolescence. The current study, therefore, covers the entire age range of early through late adolescence (i.e., from ages 13–18 years). A multiwave longitudinal design was used to examine age trends and gender differences in affective and cognitive empathy from ages 13 to 18. In addition, we examined the role of pubertal maturation status in empathy development.

Empathy is a complex phenomenon, involving cognitive and affective processes that might follow different developmental patterns. *Cognitive empathy*, or perspective taking, can be defined as the awareness and understanding of another's emotion. *Affective*

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*empathy* refers to the vicarious experience of emotions consistent with those of the observed person and often results in empathic concern, which involves feelings of sorrow or concern for another (Davis, 1983).

Although longitudinal research on adolescents' empathy development is scarce, there are theoretical reasons to expect perspective taking to increase. First, adolescents reach formal operations, Piaget's last stage of cognitive capacity (Piaget, 1932/1965), and youths develop the ability to step outside an interaction and to simultaneously consider self and other perspectives from a third-person view. This should facilitate perspective-taking development (Selman, 1980). Second, the awareness grows in early adolescence that others' emotions can be affected by factors beyond the immediate situation, which also should contribute to perspective taking (Hoffman, 2000). Third, congruent with these theories that assume ongoing development in perspective taking, recent neurological studies showed brain regions involved in perspective taking to become more active during adolescence (see Crone & Dahl, 2012). Although cross-sectional studies show conflicting results regarding the association between age and perspective taking in adolescence (e.g., Hawk et al., 2013; Karniol, Gabay, Ochion, & Harari, 1998), results of the few available longitudinal studies reveal increases in adolescents' perspective taking between the ages of 15 and 17 years (Davis & Franzoi, 1991) and between the ages of 15 and 25 years (Eisenberg et al., 2005). One study also found a stronger increase in perspective taking for girls than for boys from ages 13 to 14 years (Mestre, Samper, Frías, & Tur, 2009). Thus, on the basis of theoretical and empirical accounts, we expect increases in adolescents' perspective taking. We further explore whether increase rates differ between boys and girls.

With regard to the development of empathic concern in adolescence, the literature is not unambiguous. Theorists propose that even though affective empathy is already evident in early childhood, advances in perspective taking will still enhance the ability to sympathize with others in adolescence, resulting in increasing empathic concern (Batson, 2009; Hoffman, 2000). However, although cognitive advances are expected to facilitate growth in empathic concern, changes in adolescents' affective processing might also play a role. Emotion regulation has been found to be important for the ability to respond to others' negative emotions with concern instead of with self-focused distress (e.g., Eisenberg et al., 1998). Although emotion regulation develops in childhood, neurodevelopmental changes in affective processing might temporarily challenge emotion regulation in midadolescence (see Crone & Dahl, 2012), and this could result in stagnated growth in empathic concern. Results of empirical studies do not give decisive support for either increasing empathic concern as a result of cognitive advances or stagnating empathic concern development due to challenged emotion regulation. Cross-sectional studies found no association between age and empathic concern among eighth and 11th graders (e.g., Karniol et al., 1998); other studies found a positive association only for girls in a sample of 13- to 16-year-olds (e.g., Olweus & Endresen, 1998). Results of longitudinal studies are also inconsistent. Boys' and girls' empathic concern has shown increases between ages 13 and 14 years (Mestre et al., 2009). Increases were also found in a 3-year longitudinal study, but only for adolescents in 10th grade at the first measurement and not for adolescents in 9th grade at the first measurement (Davis & Franzoi, 1991). No changes in empathic

concern were found between ages 15 and 25 years (Eisenberg et al., 2005). Because of the inconsistencies in the theoretical and empirical literature, we explored the age trends in boys' and girls' empathic concern in the current study without making firm hypotheses.

To our knowledge, the link between pubertal maturation and the development of perspective taking and empathic concern has not yet been investigated, although there are conceptual reasons to expect pubertal changes to affect adolescents' empathy, especially empathic concern. First, gender intensification theory (Hill & Lynch, 1983) suggests that as adolescents' bodies mature, gender-specific socialization pressures strengthen. These pressures result in increased adherence to gender stereotypical behavior and, in turn, greater behavioral and psychological differences between boys and girls (e.g., Galambos, Almeida, & Petersen, 1990; Pettitt, 2004). Whereas girls are encouraged to show emotional and caring behavior, boys are encouraged to inhibit these kinds of behavior. In this way, pubertal maturation might accompany increased empathic concern for girls but decreased empathic concern for boys. Congruent with this idea, results from a meta-analysis revealed increasing gender differences in prosocial behavior during adolescence (Fabes et al., 1999). Second, boys' testosterone levels increase dramatically between early and midadolescence (Buchanan, Eccles, & Becker, 1992). High levels of testosterone have been found to accompany behavior intended to assert dominance and to achieve power (Mazur & Booth, 1998), which, in turn, might reduce emotional empathy (Lanzetta & Englis, 1989). Results of correlational and experimental studies have indeed suggested that testosterone relates negatively to empathy, although effect sizes are typically small (see Yildirim & Derksen, 2012).

In conclusion, longitudinal research on gender differences in developmental trends in perspective taking and empathic concern is scarce and has, particularly with regard to empathic concern, revealed inconsistent results. Moreover, although there are conceptual reasons to expect pubertal maturation to be associated with adolescents' empathy, to our knowledge, the role of puberty in empathy development has not yet been examined. Therefore, our aim in the current study is to investigate boys' and girls' development of perspective taking and empathic concern longitudinally from ages 13 to 18 years and to examine associations with pubertal status.

## Method

### Participants and Procedure

A sample of 497 adolescents (214 girls) was drawn from Research on Adolescent Development and Relationships (RADAR), an ongoing longitudinal study in the Netherlands. To date, six annual measurement waves have been completed. At first measurement, the adolescents were in their first year of junior high ( $M_{\text{age}} = 13.03$  years,  $SD = 0.46$ ). Most adolescents were native Dutch (95%), lived with both parents (86%), and came from families classified as medium or high socioeconomic status (89%). Adolescents participating in RADAR were recruited from randomly selected schools in the province of Utrecht and four cities in the Netherlands. Before the start of the study, parents were required to provide informed consent. Adolescents filled out questionnaires during annual home visits. Trained research assistants

provided verbal instructions in addition to written instructions that accompanied the questionnaires. At each wave, adolescents received the equivalent of \$40 in euros for their participation.

Of the original sample, 425 adolescents (86%) were still involved in the study at Wave 6, and the average participation rate over the six waves was 90%. Results of Little’s MCAR test indicated that missing values on study variables were missing completely at random for boys,  $\chi^2(536) = 497.70, p = .88$ , and for girls,  $\chi^2(432) = 459.52, p = .17$ . Therefore, all 497 cases could be included in the analyses using a full information maximum likelihood procedure in Mplus (Muthén & Muthén, 2010).

**Measures**

**Empathy.** Adolescents reported on their own empathic disposition, using two 7-item subscales of the Dutch version of the Interpersonal Reactivity Index (IRI; Davis, 1983; Hawk et al., 2013). A sample item of the Perspective Taking (PT) subscale is “I try to look at everybody’s side of a disagreement before I make a decision,” and a sample item of the Empathic Concern (EC) subscale is “I often have tender, concerned feelings for people less fortunate than me.” Adolescents scored the items on a 5-point scale, ranging from 0 (*doesn’t describe me at all*) to 4 (*describes me very well*). For the current sample, Cronbach’s alpha on PT from age 13 years to age 18 years was .59, .66, .77, .76, .78, and .76. On EC, Cronbach’s alpha was .62 at age 13 years and ranged from .72 to .77 at ages 14 to 18 years, respectively. The Dutch version of the IRI has adequate internal consistency and validity (Hawk et al., 2013).

**Pubertal status.** Adolescents’ pubertal status was measured at the first four waves (ages 13 to 16 years) using an adapted version of the self-reported Pubertal Development Scale (Petersen, Crockett, Richards, & Boxer, 1988). Four items from this scale were used for both boys and girls. Boys were asked whether they had noticed the start of pubic hair growth, underarm hair growth, facial hair growth, and voice change. Girls were asked whether they had noticed the start of pubic hair growth, underarm hair growth, and breast development and whether menarche had occurred. Responses on the items followed the structure of a Guttman scale, meaning that adolescents who reported noticing a certain change at Wave 1 should also repond “yes” on that question at subsequent waves. In the current sample, Guttman’s *R* ranged from .98 to 1.00, indicating good reliability (Guttman, 1944). For both boys and

girls, the reported changes followed the typical sequencing of pubertal events as described by Tanner (1971). Scores on the four markers of pubertal status were averaged to make a composite score at each wave, with higher scores representing a higher stage of physical maturation.

**Statistical Analyses**

Analyses were conducted in two steps. First, latent growth curve models (LGMs) were conducted in Mplus Version 6.11 so we could examine developmental trajectories separately for PT and EC. To determine which growth curve best captured observed changes, we compared models with two latent factors (i.e., intercept and linear change) and models with three latent factors (i.e., intercept, linear, and quadratic change). We used a multiple group approach in these models to test whether gender moderated growth in PT and EC. Models in which intercept means or slope means were constrained to be equal across the two gender groups were compared with the baseline model, in which all growth parameters were free to vary across the two gender groups. If the results of the chi-square difference test indicated the constrained model fit significantly worse than did the baseline model, the parameter was assumed to differ between boys and girls (Kline, 2005).

Second, we conducted multivariate growth models separately for boys and girls to examine associations between pubertal status and growth in PT and EC. Because timing and tempo of pubertal development differ between adolescents, pubertal status was specified as a time-varying covariate in these models, predicting concurrent effects on PT and EC.

**Results**

**Development of PT and EC**

**PT.** Mean levels of PT are presented in Table 1. Comparing linear and quadratic multiple group LGMs revealed the quadratic model fit the data significantly better than did the linear model,  $\Delta\chi^2(8) = 56.91, p < .001$ . Multiple group analyses revealed significant gender differences in initial levels,  $\Delta\chi^2(1) = 6.23, p < .05$ , with lower levels for boys than for girls. Boys and girls also differed significantly in linear change,  $\Delta\chi^2(1) = 21.17, p < .001$ , and in quadratic change,  $\Delta\chi^2(1) = 17.89, p < .001$  (see Table 2). There was a small significant linear decrease for boys and a

Table 1  
*Descriptives for Boys’ and Girls’ Empathic Concern, Perspective Taking, and Pubertal Status*

Scale or subscale	Age 13		Age 14		Age 15		Age 16		Age 17		Age 18	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Empathic Concern												
Boys	2.32	0.54	2.24	0.57	2.18	0.57	2.16	0.63	2.11	0.58	2.27	0.56
Girls	2.65	0.51	2.74	0.57	2.77	0.59	2.69	0.57	2.70	0.54	2.74	0.55
Perspective Taking												
Boys	2.01	0.51	2.00	0.51	1.94	0.58	2.03	0.59	2.11	0.58	2.18	0.56
Girls	2.10	0.54	2.27	0.63	2.33	0.63	2.37	0.60	2.37	0.65	2.44	0.62
Pubertal status												
Boys	.46	.34	.71	.29	.89	.19	.96	.11				
Girls	.80	.24	.95	.13	.98	.08	.99	.06				

Note. Ages are given in years. Data on pubertal status were only collected from ages 13 to 16 years.

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Table 2  
Growth Parameters of Univariate Multigroup Latent Growth Curve Models

Subscale	Intercept		Linear change		Quadratic change	
	<i>M</i>	Variance	<i>M</i>	Variance	<i>M</i>	Variance
Perspective Taking						
Boys	2.01***	.14***	-0.05*	.06***	0.02***	.002***
Girls	2.12***	.11**	0.12***	.01	-0.01*	.000
Empathic Concern						
Boys	2.32***	.14***	-0.10***	.05**	0.02***	.00**
Girls	2.67***	.13***	0.03	.02*	-0.01	.00

\*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

significant positive quadratic change, implying that boys' PT decreased from early to middle adolescence but increased thereafter. For girls, the linear change factor was positive and the quadratic change factor was negative, implying an increase in PT that leveled off over time (see Figure 1A). The quadratic LGM, in which all growth parameters were free to vary across gender, showed a good fit to the data:  $\chi^2(24, N = 497) = 29.21, p = .21$ , comparative fit index (CFI) = 1.00, root-mean-square error of approximation (RMSEA) = .03.

**EC.** Mean levels of EC are presented in Table 1. A quadratic LGM showed a better fit to the data than did a linear LGM,  $\Delta\chi^2(8) = 47.63, p < .001$ . The fit of the quadratic LGM was acceptable:  $\chi^2(24, N = 497) = 50.75, p < .01$ , CFI = .97, RMSEA = .07. Multiple group analyses revealed significant gender differences in initial levels,  $\Delta\chi^2(1) = 55.56, p < .001$ , with lower levels for boys than for girls. Boys and girls also differed significantly in linear change,  $\Delta\chi^2(1) = 13.31, p < .001$ , and in

quadratic change,  $\Delta\chi^2(1) = 12.25, p < .001$  (see Table 2). For boys, the linear change was significant and negative, but a significant positive quadratic factor implied a decrease in EC from early to middle adolescence and an increase thereafter. For girls, there was no significant linear or quadratic change, indicating stable mean levels of EC (see Figure 1B).

### Time-Specific Effects of Pubertal Status on Boys' PT and EC

Multivariate growth models that examined the associations between pubertal status and growth in PT and in EC were conducted separately for boys and girls because of the gender differences in developmental patterns in PT and EC.

**PT.** The model of boys' and girls' PT with concurrent pubertal status at ages 13–16 years as a time-varying covariate fit the data

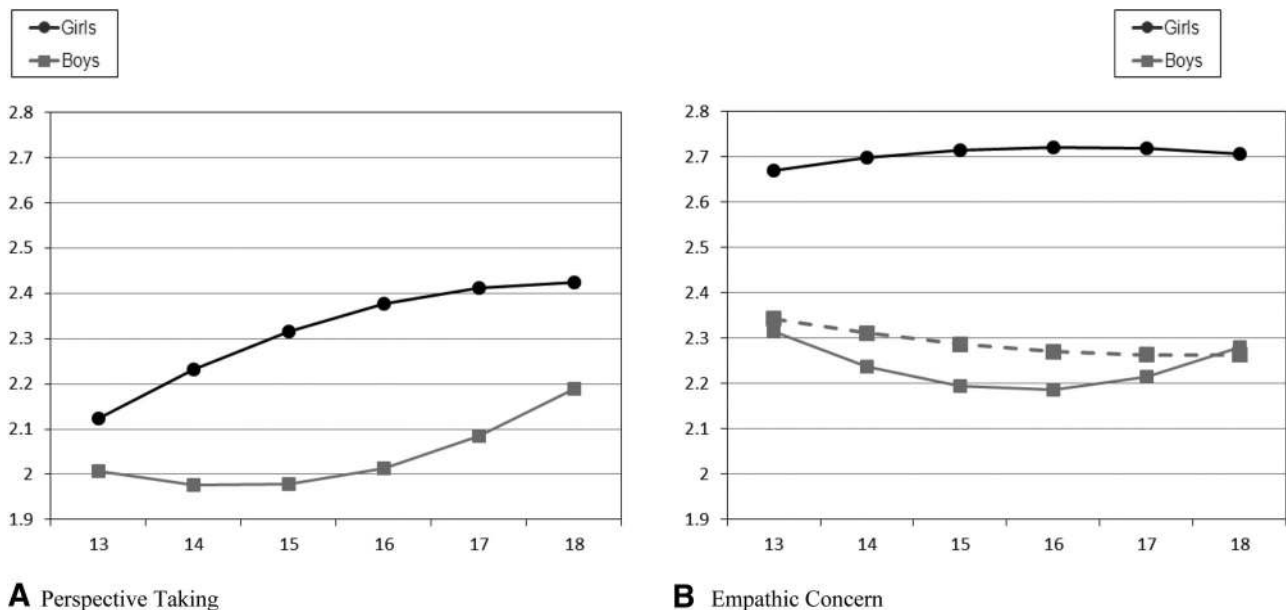


Figure 1. Solid lines represent the best fitting models for development of (a) perspective taking,  $\chi^2(24, N = 497) = 29.21, p = .21$ , comparative fit index (CFI) = 1.00, root-mean-square error of approximation (RMSEA) = .03, and (b) empathic concern,  $\chi^2(24, N = 497) = 50.75, p < .01$ , CFI = .97, RMSEA = .07. The dashed line in Figure 1B represents boys' development of empathic concern corrected for differences in pubertal status from ages 13 to 16 years.



well, but pubertal status was not significantly associated with PT ( $p > .05$ ; see Figure 2A).

**EC.** The model of boys' EC with concurrent pubertal status at ages 13–16 years as a time-varying covariate (see Figure 2B) fit the data well,  $\chi^2(35, N = 283) = 48.21, p = .07, CFI = .98, RMSEA = .04$ . Pubertal status was significantly associated with EC at age 15 years ( $\beta = -.04, p < .05$ ) and at age 16 years ( $\beta = -.02, p < .01$ ); boys who were physically more developed reported lower levels of EC, compared with their less developed peers. When controlling for variance in pubertal status, the linear change and quadratic change were no longer significant ( $M_s = -0.04, p = .33; M_q = 0.00, p = .54$ ; see Figure 1A). The model of girls' EC with pubertal status as a time-varying covariate showed an acceptable fit to the data,  $\chi^2(37, N = 214) = 66.60, p < .01, CFI = .94, RMSEA = .06$ , but pubertal status was not significantly associated with EC ( $p > .05$ ; see Figure 2B).

## Discussion

To our knowledge, the present research is the first multiple-wave longitudinal study in which age trends and gender differences in empathy were investigated across the entire span of adolescence. The results clearly showed perspective taking increasing during adolescence for both boys and girls, although boys' perspective taking increased only from the age of 15 years onward. In contrast, levels of empathic concern did not significantly increase across adolescence: Boys showed a temporary decline in empathic concern and girls showed stable levels. Moreover, our results suggest that pubertal processes might play a role in boys' development of empathic concern (but not perspective taking) between early and midadolescence.

The finding that perspective taking showed an increase in adolescence for both boys and girls is consistent with results from previous longitudinal studies (e.g., Eisenberg et al., 2005) and is also in line with developmental theories assuming youths' growing ability to simultaneously consider self- and other perspectives (Selman, 1980). Neurological studies comparing adolescents of different ages also suggest that perspective taking increases during adolescence as a consequence of continuing maturation in relevant brain regions (Crone & Dahl, 2012). Thus, our findings of increasing perspective taking in adolescence converge with results from previous research, as well as broader theories on empathy development.

Consistent with prior literature (e.g., Eisenberg & Lennon, 1983), girls had higher levels of perspective taking than boys had. Strikingly, at age 13 years, there was only a small gender difference in perspective taking. Girls' perspective taking increased between the ages of 13 and 15 years, but boys' perspective taking did not increase until age 15 years, and it even showed a slight dip before that age. This finding might be due to girls' faster maturation in cerebral cortical development from early adolescence to midadolescence (Colom & Lynn, 2004). As a result, girls are generally about two years ahead of boys in intellectual and social-cognitive functioning during adolescence (Silberman & Snarey, 1993). These differences might account for girls' earlier development in perspective taking compared with that of boys, who might catch up with girls in late adolescence. The finding of girls' increase and boys' slight dip in perspective taking between the ages of 13 and 15 years is also in line with gender role intensifi-

cation theory (Hill & Lynch, 1983), suggesting that gender differences increase in adolescence as a result of strengthened gender role expectations (e.g., Fabes et al., 1999; Galambos et al., 1990; Pettitt, 2004). To summarize, our results suggest that there are marked gender differences in empathic concern from early adolescence onward and also that gender differences in perspective taking strengthen between early and midadolescence.

Although developmental perspectives assume that adolescents' growing cognitive abilities facilitate experiences of empathic concern (Hoffman, 2000), we did not find an increase in empathic concern over the age range studied. Girls had higher levels of empathic concern than boys had, and, in concordance with the literature, this difference was stronger than that for perspective taking (e.g., Davis & Franzoi, 1991; Hoffman, 1977). Girls' levels remained stable during adolescence, and boys reported decreasing levels until age 16 years and a slight increase thereafter. A similar developmental pattern has been found for prosocial behavior (Carlo, Crockett, Randall, & Roesch, 2007). One possible reason that adolescents' empathic concern showed no increase is that during midadolescence, changes in affective processing induce intensification of emotional experiences (Crone & Dahl, 2012). Intense emotionality in response to others' distress could lead to a self-focused reaction instead of empathic concern (Eisenberg et al., 1998). A second reason might be that we measured the tendency to experience feelings of concern in daily situations rather than the capacity to respond with empathic concern in situations requiring high-level perspective taking (see Eisenberg et al., 2005). Although adolescents should increasingly be able to be compassionate in complex situations, their tendency to sympathize with others in everyday life might depend on motivation rather than on cognitive ability. For instance, gender role expectations might encourage boys to inhibit emotional and caring behavior (e.g., Karniol et al., 1998). The fact that girls' levels of empathic concern did not increase, even though increases could be expected as a result of gender-specific socialization pressures, might be due to girls' earlier maturation: Girls already report relatively high levels of empathic concern at age 13 years.

Strikingly, boys showed a decline in empathic concern between ages 13 and 16 years, with a rebound to the initial level thereafter. Our results suggest that pubertal processes play a small role in this temporary decrease: Boys who were physically more mature reported lower levels of empathic concern than did their physically less mature peers at ages 15 and 16 years. Moreover, when controlling for pubertal status, the dip in boys' mean levels of empathic concern disappeared. The association between boys' pubertal status and empathic concern might partly result from the increase in testosterone during pubertal maturation (Buchanan et al., 1992), which could induce an increase in competitive behavior (Mazur & Booth, 1998), thereby reducing empathy (Lanzetta & Englis, 1989). Our results are also in line with research on adolescent brain development indicating that pubertal processes influence emotional development (see Crone & Dahl, 2012). Further, gender role expectations might also play a role: Boys who are physically more mature likely adhere more strongly to stereotypically masculine behavior and might therefore be more inclined to inhibit empathic concern. However, it is important to emphasize that the effects concerning boys' pubertal status were small. The finding that pubertal status was related to boys' empathic concern but not perspective taking can be explained by the fact that

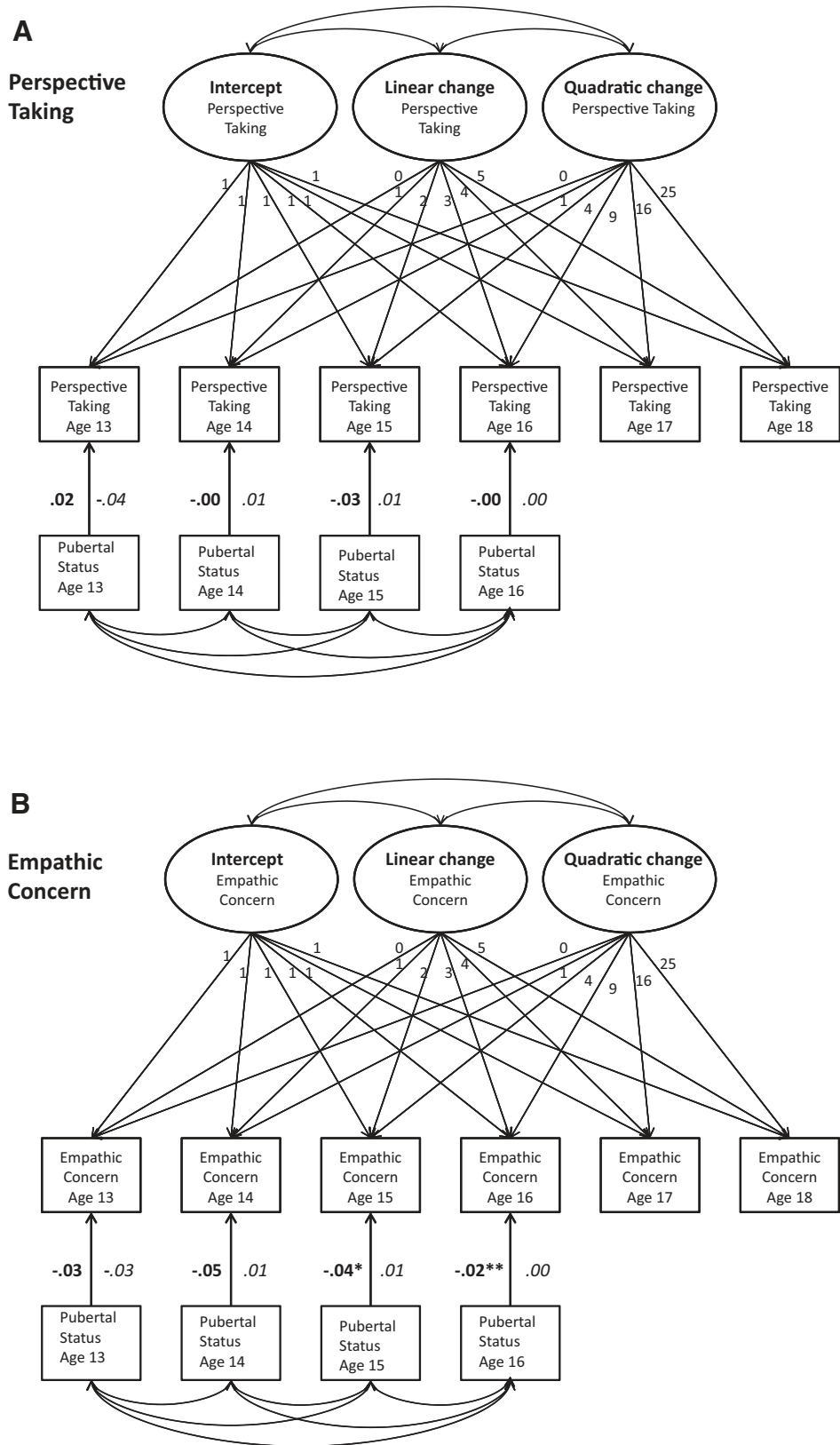


Figure 2. Latent growth model with concurrent associations of pubertal status with (A) perspective taking and (B) empathic concern. Standardized estimates are printed bold for boys and italic for girls. \*  $p < .05$ . \*\*  $p < .01$ .

although empathic concern and perspective taking both encompass a response to another's emotion, empathic concern primarily refers to an emotional response, whereas perspective taking primarily refers to a cognitive response. Hence, empathic concern corresponds more closely than perspective taking does to the stereotypical female role (Hoffman, 1977), and boys' empathic concern might therefore be more affected than perspective taking by changing social expectations during pubertal maturation. Further, the lack of an association between pubertal status and either empathic concern or perspective taking for girls could be due to the fact that several physical changes that accompany girls' pubertal maturation have already started at age 13 years, the time of our first assessment (Tanner, 1971). Hence, our assessments started too late to capture girls' pubertal maturation. Therefore, it is important for future research to replicate the findings with regard to the association between boys' pubertal status and empathic concern and to incorporate assessments of girls' pubertal status and empathy at an earlier age. At the same time, results of our study suggest that pubertal processes might play a small role in boys' dip in empathic concern.

Our results should be interpreted in light of some limitations. First, self-reports were used to assess empathic concern, perspective taking, and pubertal status. Although more objective data would be obtained when adding parent-reported or observational measures, previous studies have validated these measures (e.g., Hawk et al., 2013; Shirtcliff, Dahl, & Pollak, 2009). Moreover, because empathy is an internal process, adolescents might be better informants than parents or peers are, and these self-perceptions might still be important and guide behavior. Furthermore, even if social desirability would have biased adolescents' reports of empathy, the fact that boys report that their empathic concern declines in midadolescence and increases thereafter is still of high interest. Social desirability partly reflects what adolescents think is appropriate for their gender, and they might actually behave in ways consistent with socially desirable expectations. Second, because the same measure was used to assess empathy at six different time points, retest effects could have biased our results. However, the 1-year intervals between the time points make retest effects unlikely. Third, because we did not measure gender role orientation, we cannot exclude the possibility that the gender differences in developmental trends are (partly) due to differences in gender role orientation instead of gender per se (Karniol et al., 1998). Finally, most participants were Caucasian and from relatively high socioeconomic status families, which limits the generalizability of the findings beyond the current sample.

Notwithstanding the limitations, the present study advances the understanding of empathy development. As yet, few studies have addressed gender differences in empathy development across adolescence. The findings that empathic concern and perspective taking development follow a nonlinear pattern during adolescence and that pubertal status is associated with boys' development of empathic concern might explain inconsistencies in previous research. Results of the current study suggest that perspective taking and empathic concern develop differently and that developmental trends are markedly different for boys and girls. Hence, future studies on empathy should separate perspective taking and empathic concern and should take the diverging development of boys and girls into account. A particularly noteworthy finding of the current study is the temporary decrease in boys' empathic concern

(and the slight dip in perspective taking) in midadolescence. It is important for parents, teachers, and other people working with adolescents to take these developmental changes into account, as they might affect adolescents' social interactions and the extent to which they show prosocial behavior. Further, associations between boys' pubertal status and empathic concern suggested that pubertal processes might play a role in the development of boys' empathic concern.

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