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ORIGINAL ARTICLE

Growth Trajectories of Perceived Parental Behavior During Adolescence

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Abstract

Perceived parental behaviour has mainly been studied in association with various developmental outcomes in children and adolescents but less is known about the underlying developmental change of parental behavior during adolescence. In the present study, a sample of N = 552 participants aged 11–12 years were assessed at three measurement times during adolescence. Perceived acceptance, psychological control, and structure were measured separately for both parents with the brief Perceived Parental Behavior Inventory (PPBI). Trajectories were analyzed using individual growth curve models. Perceived acceptance did not change over time for either parent and there were no sex differences. In contrast, parental psychological control and structure decreased and showed sex differences during adolescence. The latter effect was stronger in boys. This study documents normative developmental trajectories of perceived parental behaviour during adolescence. The PPBI adequately reflects developmental changes in perceived parental behaviour across adolescence and may represent a useful tool in future studies.

Keywords Adolescence · Perceived parental behavior · Trajectories · Longitudinal study

Introduction

Generally, the first and most long-lasting social bond for most humans is the one between parents and their children. Starting in infancy, the behavior of children is shaped by interactions with their parents and their behavior is determined by these early attachment experiences. Parental behavior has been classified in various ways and there is some agreement that it may be described by two or three major dimensions, which may also determine a specific parenting style [1–6].

The first dimension is characterized by parental warmth and acceptance. Parents with high acceptance show high levels of involvement, responsiveness, help and support to their children, and give advice when needed. They like to spend time with their children, praise them, are emotionally accessible and caring and show confidence in them. The second dimension refers to the extent to which a parent enforces psychological control, pressure, intrusion and domination. Parents with high levels of this dimension may show more physical and psychological punishment, more expressive rejection and less acceptance of a child's autonomy. They compare the child's behavior with that of other children, carp at them and demonstrate inconsistent parental behavior. The third dimension reflects parental behavioral control, regulation, and structure. This dimension is defined by an open and transparent controlling behavior with clear and comprehensible behavioral rules and consequences. These rules serve to protect the children. This kind of parental behavior is also used to push performance expectation and sometimes leads to overprotection. The discrimination among the two last dimensions is not always clear and they may overlap, but

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the most important factor for differentiation is the type of control. One type is rather covert and refers to the second dimension of psychological control, while the other type is characterized by open and transparent control mechanisms including guidance and monitoring and refers to the third dimension [5, 7–14].

The impact of parental behavior on the child`s development has been documented in a large number of studies. For example, parenting characteristics and behavior such as emotional warmth, clear and comprehensible rules, and scope for action and decision making lead to positive developmental outcomes in children [15]. The quality of parental rearing behavior is also seen as an important factor regarding the development of a child's personality, including psychological problems [16–18]. Parental warmth and acceptance is especially associated with positive outcomes such as self-esteem [19, 20], active coping behavior [20] and fewer depressive symptoms [20], while parental rejection is associated with depressive symptoms [21] and anxiety [22, 23]. High levels of psychological control is also associated with internalizing and externalizing problems [16, 24]. Similar effects are not only found in children but also in adolescents and even adults [20, 22, 25–28].

While the assessment of parenting behavior between infancy and early childhood might show validity if studied through directly observing parents or by assessing parental responses to specific questionnaires [29], the assessment of preadolescence requires a strong focus on how the young person perceives their parent [7, 17, 24, 30]. From this age on, the inclusion of the adolescent informant is crucial as there may be discrepancies between how the parental behavior is experienced by the adolescent and the self-perception of the parents, and this may have a strong impact on adolescent development, including major or minor psychological problems [24, 30]. Thus, the study of parental behavior during adolescence has to be based on suitable assessment instruments reflecting the perceived parental behavior, i.e. the way in which adolescents perceive their parents.

Although it has been argued by Feinberg et al. that development may impact the perception of parental behavior [31], so far, a majority of studies have not taken this in to consideration. Two studies analyzed the three cited dimensions of perceived parental behavior with samples from grades 2–4 (age 7–10) [32] and 4–8 (age 9–14) [8], respectively. These cross-sectional studies based predominantly on children and preadolescents found significant differences across grades for all three parenting dimensions and both studies reported a decrease in psychological control. In the older sample, there was also a decrease of perceived acceptance and an increase of rule- making/control [8]. Although these studies may provide evidence that perceived parental behavior changes over time, their significance is limited by their cross-sectional design.

Another study by Barber et al. [14] assessed three similar dimensions of parental behavior based on both parent and adolescent reports in a longitudinal sample. This study showed no linear changes in the acceptance and psychological control dimensions. However, the study found a possible quadratic pattern in parental psychological control dependent on the reporter. Children perceived parental monitoring behavior to be stable, while parents perceived it as declining. Further studies have also found a declining pattern for parental behavioral control or monitoring [18, 33, 34] including a study [35] showing a decrease in perceived demandingness in adolescents.

In addition, Armentrout et al. [8] observed sex differences in early adolescence. Girls perceived more parental acceptance than boys (in grades 6 and 8) and boys perceived more psychological control by their parents than girls did. Keijsers and Poulin found that girls perceived higher levels of parental behavioral control and monitoring [34]. This sex effect on perceived parental behavior was also identified in other studies [21, 24, 30, 36]. In contrast, Shek et al. [37] analyzed the influence of the dimension of psychological control on well-being among Chinese adolescents and failed to find any sex differences.

The aim of the present study was the analysis of developmental trajectories of the major dimensions of perceived parental behavior in a large Swiss community sample assessed longitudinally at three time points across adolescence until the transition into young adulthood. In consideration of findings from studies based on adolescent samples [14, 18, 33, 34], we expect to find no linear decline in the dimension of perceived parental acceptance but to see a decline in the dimension of perceived behavioral control, structure, or monitoring across adolescence into young adulthood.

Method

Design

Originally, the sample was based on a cohort of N = 1110 preadolescents and adolescents aged 11–17 of the longitudinal Zurich Adolescent Psychology and Psychopathology Study (ZAPPS, see Steinhausen et al. [38] for more information). The cohort was a stratified randomized school-based sample representing the 12 counties of the canton of Zurich, which was studied at three assessment times in 1994, 1997, and 2001. Some participants dropped out from the sample over the course of the study and some were added due to school and class changes.

Participants

To evaluate developmental time effects of perceived parental behavior in adolescent boys and girls, we only included participants who were in their preadolescence at the first assessment, namely at age 11–12 ($M = 11.44$, $SD = 0.5$). The overall sample size was N = 552 and the mean age at time 2 was 14.51 (SD = 0.59) and at time 3 it was 18.11 (SD = 0.71). As the statistical methods used in this study were suitable for handling unbalanced datasets, we included the reduced data sets of adolescents who participated at two (N = 310, 56.2%) or three (N = 242, 43.8%) assessment points. The sample comprised N = 251 (45.5%) males and N = 301 (54.5%) females with a significantly ($p = 0.03$) more girls in our sample. The large majority of 94.7% (N = 523) of the overall sample were Swiss and 5.3% (N = 29) had experienced a parental divorce during adolescence.

Measure

Perceived parental behavior was measured by use of the Zurich Perceived Parental Behavior Inventory (PPBI) consisting of 32 items [20]. This inventory was constructed for the ZAPPS on the basis of the Child's Report of Parental Behavior Inventory (CRPBI) and the Bronfenbrenner Parental Behavior Questionnaire [5, 7, 39]. The three scales of the inventory were separately assessed for mothers and fathers based on items with response scales ranging from 0 to 3 (from "not true" to "always true") at all three measurement times [20]. Confirmatory factor analysis in the original ZAPPS sample revealed three factors explaining 34% of the variance for mothers and 35% of the variance for the fathers. Five items were excluded from one of the three scales due to low discriminatory power or redundancy, so that the final questionnaire contained 27 items [20]. A copy of the PPBI with a legend showing the item numbers relating to the three subscales is documented in the appendix.

The three identified scales were "warmth and support" (e. g., "my mother /father praises me when I do something good") including 12 items, "psychological pressure" (e. g. "my mother / father easily becomes upset if I don't do what she/he says") including 9 items and "demands and control" (e. g. "my mother / father has clear rules for my behavior") including six items. The scale "warmth and support" included comforting, affectionate, encouraging and supporting behavior as well as acceptance towards the child. "Psychological pressure" comprises of inconsistencies in handling unwanted behavior, punishing behavior through psychological pressure, mistrust and less acceptance. The third scale "demands and control" reflected clear rules-setting, supervision, and monitoring behavior by the parents.

The resulting scales were identical for maternal and paternal behavior and correlated highly (r = 0.71—0.79). Internal consistency ranged between $\alpha = 0.68$ and $\alpha = 0.89$ at the three assessments. Measurement invariance was tested separately for all three scales in longitudinal models considering data collected at time 1 and time 2. Hierarchical analyses of three aspects, namely, structure, item reliability, and construct variance revealed that these aspects were invariant for both the maternal and paternal version [40]. Furthermore, it was shown that in terms of predictive validity the scales of the inventory corresponded to various developmental outcomes like self-esteem, coping behavior, and both externalizing and internalizing symptoms in a significant and meaningful way [20].

For the present paper, we decided to rename the scales parental acceptance, psychological control, and structure in order to simplify the terminology and align with the conceptualization of other researchers [7, 9–11].

Data Analysis

As a first step, repeated measures ANOVAs were conducted to analyze differences between maternal and paternal measures. To analyze the rate of change over time, we used individual growth curve models (IGC). The advantage of this procedure is that it does not require balanced datasets across different measurement points and can handle missing values with the maximum likelihood (ML) estimation [41, 42]. Due to this approach, the data is not biased due to systematic exclusion [43]. Additionally, ICG allow for the study of intra- and inter-individual differences in growth parameters. These prerequisites are important in longitudinal psychological research because individuals tend to vary mostly not only in their initial status but also in their rate of change [44]. An ICC of 0.25 or above favors ICG over a more traditional method for estimating fixed effects.

To conduct this analysis, we followed the procedure by Singer and Willet [41] as summarized by Shek and Ma [45]. In the present paper, this method was used to analyze individual change during adolescence on the outcome variables of perceived parental acceptance, psychological control, and structure of each parent and also examining the effect of the sex of the participants. First, unconditional mean models were estimated to examine individual variations in outcome variables, and used as a baseline model and test of the feasibility of the IGC Models. Secondly, unconditional linear growth curve models were conducted to examine the individual variation of growth rates. Predictors were not included in this model. Thirdly, a conditional model was used to investigate the impact of sex as a predictor on the growth parameters. Time and the initial status were included as random factors to allow for random slopes and intercepts. To further differentiate between the unconditional linear growth model and the conditional growth model, the Akaike Information Criterion (AIC), the Bayesian Information Criterion (BIC),

and a likelihood ratio test were used. Smaller AIC and BIC values and a significant difference of the likelihood ratio test comparing the conditional model and the base model indicate a better model fit. Missing data analyses were performed using Little's test of "missing completely at random" [46]. All data analyses were based on raw scores and were performed using SPSS for Windows version 23 [47].

Results

Missing data analysis showed that the values at T1 (χ^2 (2079, N = 320) = 2065.33, $p = 0.58$) for both parents and regarding maternal behavior at T2 were missing completely at random (χ^2 (463, N = 545) = 501.48, $p = 0.11$). Little's test showed that the values regarding perceived paternal behavior at T2 and the respective values for both parents at T3 were not missing completely at random. Additional analyses revealed that these missing values were dependent on marital status, namely, on divorce so that it may be assumed that the missing values were also missing at random. However, parental divorce (before the respective time point) showed low but significant correlations with perceived maternal structure at T2 (r = -0.09, $p = 0.045$) and perceived parental psychological control at T3 (mothers: r = -0.09, $p = 0.044$, fathers: r = -0.11, $p = 0.018$).

Repeated measures ANOVAs showed significant differences of maternal and paternal acceptance and structure during all three assessment points. Generally, the scores of perceived maternal acceptance (Wilks' Lambda = 0.77, F(1,205) = 61.96, $p < 0.001$) and structure (Wilks' Lambda = 0.72, F(1,205) = 81.07, $p < 0.001$) were higher than the respective scores of the fathers. Psychological control did not show any significant differences between mothers and fathers (Wilks' Lambda = 0.99, F(1,205) = 1.51, $p = 0.22$). As the method of repeated measures ANOVA in general does not allow for missing values and reduced the sample size in the present study to N = 206, additional cross-sectional mean comparison analyses by t-tests were performed. The results were the same as with the repeated measures ANOVA.

The descriptive values of perceived parental behavior can be found in Table 1. Additionally, Pearson correlation coefficients of the three subscales were significant (acceptance: $r = 0.25$—0.75, psychological control: $r = 0.25$–0.80, structure: $r = 0.30$–0.76) at all three assessment points.

The intraclass coefficients (ICC) for perceived parental acceptance were 0.47 (mother) and 0.44 (father) indicating that approximately 47% or 44% of the variation in this outcome variable was due to interindividual (between-person) differences. For perceived parental psychological control, the ICC values were 0.37 (mother) and 0.38 (father), whereas they were 0.35 (mother) and 0.35 (father) for parental structure. These values were well above 0.25 and, thus, the use of this model in the analysis was adequate [45]. Detailed results for conditional model findings including sex as a predictor can be seen in Table 2 for maternal outcome scales and in Table 3 for paternal scales.

Perceived Parental Acceptance

While the unconditional model of perceived maternal acceptance indicates that the initial status and linear growth rate were not constant over time ($\beta = 0.37$, SE = 0.16, $p = 0.025$), the same effect was not found for perceived paternal acceptance ($\beta = -0.07$, SE = 0.20,

Table 1 Descriptive findings of the three perceived parental behavior dimensions in mothers and fathers

	Mother									Father								
	Acceptance			Psychological control			Structure			Acceptance			Psychological control			Structure		
	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD
Total																		
T1	320	27.15	5.26	320	7.32	4.69	320	11.55	3.55	317	25.44	5.45	317	7.01	4.30	317	10.54	3.49
T2	545	26.06	5.78	545	6.74	4.44	545	11.20	3.48	503	23.91	6.53	503	6.62	4.32	503	10.09	3.64
T3	462	27.59	5.88	462	4.85	4.35	462	9.55	3.75	428	25.14	7.05	428	4.82	4.15	428	7.99	3.87
Boys																		
T1	160	26.57	5.50	160	8.08	4.64	160	11.90	3.31	158	25.09	5.66	158	7.74	4.28	158	10.91	3.32
T2	248	25.71	5.71	248	7.23	4.22	248	11.57	3.50	234	24.14	6.24	234	6.99	4.29	243	10.34	3.51
T3	203	26.87	6.03	203	5.09	4.21	203	9.45	3.59	189	25.00	7.11	189	4.85	3.97	189	7.79	3.79
Girls																		
T1	160	27.73	4.95	160	6.56	4.64	160	11.21	3.77	159	25.78	5.23	159	6.29	4.20	159	10.18	3.63
T2	297	26.35	5.83	297	6.33	4.59	297	10.89	3.44	269	23.70	6.79	269	6.30	4.33	269	9.87	3.74
T3	259	28.16	5.70	259	4.66	4.46	259	9.62	3.88	239	25.24	7.02	239	4.80	4.31	239	8.15	3.93

Table 2 Fixed effects of IGC analysis with perceived maternal behavior

	Acceptance					Psychological control					Structure				
	Coeff	SE	*p*	95%CI		Coeff	SE	*p*	95%CI		Coeff	SE	*p*	95%CI	
Intercept	25.15	1.22	< 0.001	22.75	27.55	10.35	0.67	< 0.001	9.99	14.28	14.87	0.84	< 0.001	13.21	16.52
Time	0.07	0.53	0.90	− 0.97	1.11	− 2.15	0.45	< 0.001	− 2.99	− 1.20	− 1.65	0.37	< 0.001	− 2.38	− 0.92
Sex	0.58	0.77	0.45	− 0.93	2.08	− 1.48	0.43	0.001	− 3.31	− 0.63	− 1.28	0.52	0.015	− 2.31	− 0.25
Sex*Time	0.19	0.33	0.57	− 0.46	0.83	0.51	0.28	0.073	− 0.06	1.05	0.40	0.23	0.082	− 0.05	0.57

Table 3 Fixed effects of IGC analysis with perceived paternal behavior

	Acceptance					Psychological control					Structure				
	Coeff	SE	*p*	95%CI		Coeff	SE	*p*	95%CI		Coeff	SE	*p*	95%CI	
Intercept	24.93	1.37	< 0.001	22.24	27.64	11.49	1.02	< 0.001	9.48	13.50	14.27	0.86	< 0.001	12.57	15.96
Time	− 0.18	0.63	0.77	− 1.42	1.06	− 2.03	0.43	< 0.001	− 2.87	− 1.19	− 2.06	0.38	< 0.001	− 2.81	− 1.30
Sex	− 0.11	0.86	0.90	− 1.80	1.58	− 1.84	0.64	0.004	− 3.10	− 0.58	− 1.34	0.54	0.013	− 2.40	− 0.28
Sex*Time	0.07	0.39	0.86	− 0.71	0.84	0.54	0.27	0.044	0.01	1.06	0.41	0.24	0.041	0.02	0.95

Unconditional models of perceived paternal acceptance did not show an interindividual difference in change over time

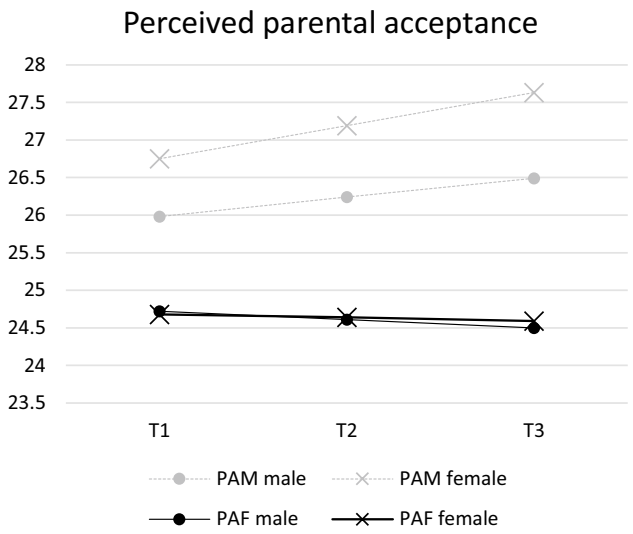

Fig. 1 Predicted estimates of perceived parental acceptance. *PAM* Perceived acceptance mother, *PAF* perceived acceptance father

$p = 0.70$). However, further analysis by use of a conditional model for perceived maternal and paternal acceptance including sex as a predictor showed no significant effect, neither for time nor for sex (see Table 2 and Fig. 1). Including a time variable and sex as predictors did not increase the model fit coefficients significantly (maternal acceptance: $\chi 2\ (2) = 5.73$, $p = 0.06$; Δ AIC = − 1.73; Δ BIC = 11.64; paternal acceptance $\chi 2\ (2) = 0.03$, $p = 0.99$; Δ AIC = 3.97; Δ BIC = 14.23).

Perceived Parental Psychological Control

Unconditional models of both parents showed a significant difference in growth rates over time. There was a linear decrease in the parental psychological control scores (mother: β = − 1.35, SE = 0.14, $p < 0.001$; father: β = − 1.22, SE = 0.13, $p < 0.001$). The conditional model with perceived maternal psychological control showed a significant main effect of time and sex, but no time by sex interaction while the results for paternal psychological control revealed a significant time by sex interaction (see Table 2). Trajectories of perceived parental psychological control significantly decreased in both girls and boys during adolescence. Boys experienced more psychological control than girls from both parents during adolescence and the significant time by sex interaction in paternal psychological control showed a stronger decrease in boys over time (see Fig. 2). The linear conditional model significantly improved the model fit over the unconditional model (maternal control: $\chi 2\ (2) = 11.57$, $p < 0.001$; Δ AIC = 52.43; Δ BIC = 2.8; paternal control $\chi 2\ (2) = 9.33$, $p = 0.01$; Δ AIC = 5.33; Δ BIC = 4.92).

Perceived Parental Structure

The significant values of the intercept and the linear slope estimates indicated that the initial status and linear growth rate were not constant over time. There was a significant linear decrease in both scores of perceived maternal and paternal structure (mother: β = − 1.04, SE = 0.12, p < 0.001; father: β = − 1.32, SE = 0.12, $p < 0.001$). The conditional model showed a significant main effect for sex for perceived maternal as well as paternal structure. There was also a

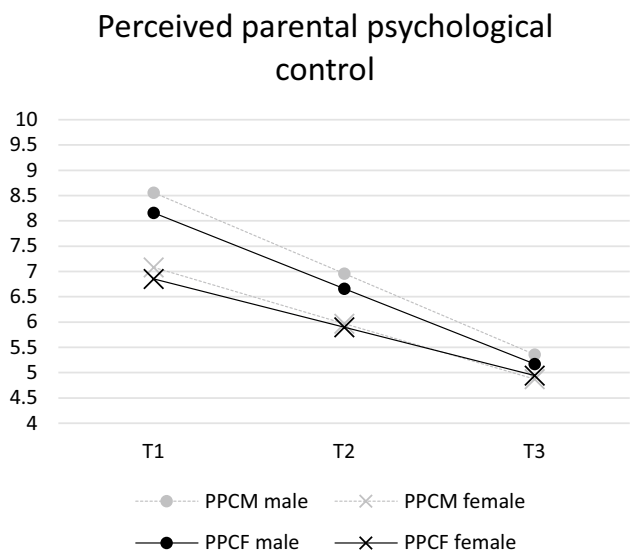

Fig. 2 Predicted estimates of perceived parental psychological control. *PPCM* Perceived psychological control mother, *PPCF* perceived psychological control father

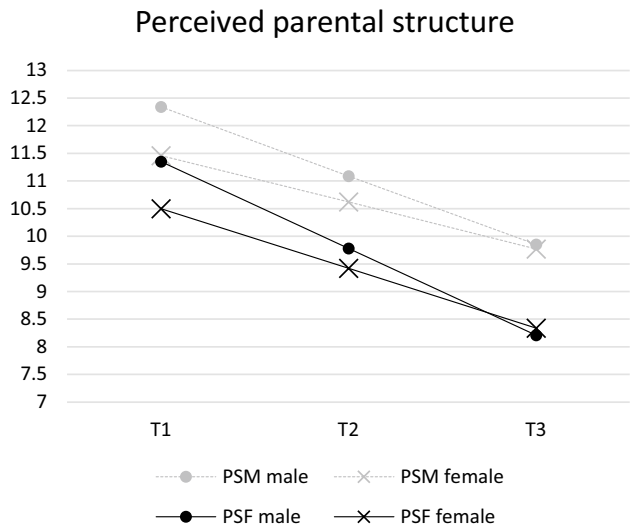

Fig. 3 Predicted estimates of perceived parental structure. *PSM* Perceived structure mother, *PSF* perceived structure father

significant time by sex interaction, but this interaction was only significant for paternal structure ($p = 0.041$). Monitoring and structuring behavior of both parents was perceived as declining during the course of adolescence. In preadolescence, boys experienced more structure from both parents, but this effect changed in late adolescence. Perceived paternal structure decreased more so in boys than in girls (see Fig. 3). There was a significant improvement of the model fit from the linear conditional model significantly over the unconditional model (maternal structure: $\chi 2\ (2) = 6.65$, $p = 0.04$; Δ AIC = 2.65; Δ BIC = 7.75; paternal structure: $\chi 2\ (2) = 6.25$, $p = 0.04$; Δ AIC = 2.2; Δ BIC = 8.05).

Additional analyses with a sample only including the participants who completed the entire assessment (N = 242, male = 48.8%, female = 51.2%) showed similar results. However, there was no significant time by sex interactions in the completer sample.

Discussion

This longitudinal study examined developmental trends of perceived parental behavior among adolescent girls and boys. The present study found a developmental change across age in only two of the three dimensions of parental behavior. While perceived parental acceptance in both mothers and fathers did not show any significant change with age or significant sex differences, both perceived maternal and paternal psychological control and structure changed significantly through adolescence, and these perceptions differed also in girls and boys.

Although we found a significant change in perceived maternal acceptance in the unconditional model, the effect did not persist when sex was included in the model. These results are in line with our hypothesis and the findings by Barber et al. [14], but contrary to the results of the study by Armentrout & Burger [8] and Luyckx et al. [18] who found a decrease of perceived acceptance. Considering the differences in the age span of the sample by Armentrout and Burger [8], the findings of the two studies tend to imply that the perception of accepting and supportive behavior first decreases during preadolescence and then remains stable or possibly increases during middle or late adolescence. The different findings in the study by Luyckx et al. [18] might be explained by the use of parent reports for measuring parental behavior and potential differences in the conceptualization of this parenting dimension. However, our results are in line with Barber et al. [14] who included both parent and child reports. Additionally, in contrast to the findings by Armentrout and Burger [8], there were no sex differences in perceived maternal and paternal acceptance in the present study. This discrepant result may be due to the different age span, potential cohort effects or even cultural differences, as the mentioned study was carried out in an American sample in the early seventies while the present study's data comes from a Swiss sample with data collection up to three decades later. However, our finding that mothers were perceived as more accepting than fathers through adolescence by both sexes is in line with the preceding research [8, 32].

In line with Armentrout and Burger [8], the perception of parental psychological control decreased with age. Therefore, we suggest, that the dimension of perceived behavior is less prominent not only in early adolescence, but also in

middle and late adolescence. Contrary to our results, Luyckx et al. [18] did not find a linear change in the dimension of "inconsistent discipline". As discussed above in the section on parental acceptance, this might be due to differences in conceptualization. The dimension "inconsistent discipline" may reflect only a part of our dimension of psychological control and differ when reported from a child's point of view. Barber et al. [14] found a fluctuation in the dimension of psychological control and noted school change as a possible reason for this finding. Furthermore, the study by Barber et al. [14] included 5th to 8th graders, which could have led to a possible age effect.

While Shek et al. [37] did not find any significant sex differences, the present study revealed that boys perceived more psychological control in early adolescence from both parents than girls, a finding that is also supported in samples composed of early adolescents [8, 24]. However, the results from other studies suggesting that children and adolescents perceived more psychological control by their mothers was only replicated in preadolescents in the present sample [8, 32, 37], suggesting that this effect may vanish with increasing age.

The finding that perceived parental structure decreased during adolescence in the present study is in contrast to the reported increase in early adolescence in the study by Armentrout and Burger [8], but in line with the findings by Paulson and Sputa [35], Keijsers and Poulin [34] and Keijsers et al. [33]. However, the samples of the cross-sectional study by Armentrout and Burger [8] and the present longitudinal study only partially overlap, and so the discrepant findings might well be explained by methodological differences. From a developmental point of view, a decrease in perceived parental structure is understandable due to developmental processes including an increase in the autonomy development of the adolescent [48]. Generally, boys showed a stronger decrease than girls, but their initial status of perceived parental structure was also higher in preadolescence. Mothers were perceived to give more structure and monitoring than fathers by both sexes. The study by Armentrout and Burger [8] did not find this difference in early adolescents, but the results in the study by Paulson and Spunta [35] based on a sample of middle to late adolescents support the finding of the present study. However, sex differences in our sample decreased during the course of adolescence. Our results did not support the findings that girls generally perceived higher levels of parental structure as observed in the study by Keijsers et al. [34].

In addition to providing an insight into the developmental trajectories of perceived parental behavior from adolescence into young adulthood, the findings of the present paper might also serve as a foundation and orientation for further research. We have already shown in a number of studies that the PPBI inventory used in the present study was useful in studying the associations of perceived parental behavior across various clinical problems in adolescents, namely, as a risk factor of various mental health problems [49] including substance use problems [50–52], depression [53], and suicidality [54, 55]. The effect on other clinical entities including externalizing problems, in particular, might be worth analyzing and future studies might also be interested in examining potential effects of perceived parental behavior on the outcome of psychosocial interventions in various clinical samples.

Finally, the strengths and limitations of the present study need to be addressed. The longitudinal design with repeated assessments during the course of adolescence and employing a statistical method suitable for unbalanced datasets in relation to the outcome variable represent the strengths of the present study. However, there are also some limitations. IGC analyses estimate the change trajectories more precisely when the number of time points is sufficiently increased. Three time points represent the lower limit and it was not possible to incorporate possible quadratic trajectories. Therefore, further research in this domain will benefit from including more than three assessment points.

In addition, it needs to be emphasized again that the focus of the present study was on perceived parental behavior from the viewpoint of the adolescent. The present study was not suited for analyzing potential differences between parental reports of their behavior towards the adolescent or perceived parental behavior, which according to some studies may be present [24, 30]. Further studies might consider the inclusion of parent reports of their behavior so that the relevance of the informant might be studied. However, there is some evidence that the development of children is guided more so by their perception of parental behavior rather than the actual accepting or controlling behavior of their parents [7, 24, 35]. Similar findings might also be obtained when studying adolescents. Additionally, there is some evidence that social factors (e.g. socioeconomic status, nationality), stressful life events or parenting stress [56, 57] exert an impact on parenting behavior and its perception. These factors should be included in future research.

Summary

The present longitudinal study examined the developmental trends of perceived parental acceptance, psychological control, and structure in a community sample of adolescent boys and girls. The study revealed trends of decreasing parental psychological control and structure while parental acceptance remained constant across adolescence. Sex differences were found for perceived parental psychological control and structure with boys showing higher values, especially in early adolescence. These findings represent normative

developmental trends in parent–child relationships and reflect the increasing autonomy of adolescents while indicating also a decline in the ability of the parents to structure the behavior of their offspring. These changes during adolescence may represent rather positive prerequisites for the transition into a mature and independent personality of young adults who tend to keep a warm and loving relationship to their parents when they no longer feel subjected to parental structure and monitoring.

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Compliance with Ethical Standards

Conflict of Interest AS and CW report no conflict of interest. HCS worked as a speaker for Medice and has received book royalties from Cambridge University Press, Elsevier, Hogrefe, Huber, Klett, and Kohlhammer publishers.

Ethical approval At the time of the first data collection for this study in 1994 and the first publication based on the Zurich Epidemiological Study of Child and Adolescent Psychopathology (ZESCAP) in 1998 and its later follow-up study called the Zurich Adolescent Psychology and Psychopathology Study (ZAPPS), no ethical committee existed at the study centre (based at the University of Zurich) or in the Canton of Zurich, Switzerland, to give approval. The Principal Investigator of the original study (HCS.) assures that the involvement of the local school authorities (a governmental institution of the Canton of Zurich, Switzerland) and the informed consent of the parents of all participating pupils should be regarded as an equivalent to the approval of an ethical committee, together with the past financial support of the project from the federal Swiss Science Foundation over several years. Furthermore, all authors declare that the present and earlier studies were conducted in compliance with the APA Ethical Principles. Several earlier articles based on ZESCAP data have been published by various international journals in the past. The authors also declare that no retrospective ethical approval has been sought or requested in the past and that such a procedure could not be considered feasible or realistic given the circumstances.

References

1. Arrindell WA, Perris C, Perris H et al (1986) Cross-national invariance of dimensions of parental rearing behaviour: comparison of psychometric data of Swedish depressives and healthy subjects with Dutch target ratings on the EMBU. Br J Psychiatry 148:305–309. https://doi.org/10.1192/bjp.148.3.305
2. Schumacher J (2002) Perzipiertes elterliches Erziehungsverhalten. Konzeptualisierung, diagnostische Erfassung und psychologische Relevanz im Erwachsenenalter: [Perceived parental behavior: Conceptualization, diagnostic assessment and psychological relevance in adulthood. Postdoc Thesis at the University of Leipzig 2001]. University of Leipzig, Postdoc Thesis. Lang, Frankfurt am Main
3. Schumacher J, Eisemann M, Brähler E (1999) Rückblick auf die Eltern: Der Fragebogen zum erinnerten elterlichen Erziehungsverhalten (FEE) [Parents in retrospect: the inventory on recalled parental behavior (FEE)]. Diagnostica 45(4):194–204. https://doi.org/10.1026//0012-1924.45.4.194
4. Rohner RP (1986) New perspectives on family. The warmth dimension: Foundations of parental acceptance-rejection theory. Sage Publications Inc, London
5. Siegelman M (1965) Evaluation of Bronfenbrenner's questionnaire for children concerning parental behavior. Child Dev 36(1):163. https://doi.org/10.2307/1126788
6. Renson GJ, Schaefer ES, Levy BI (1968) Cross-national validity of a spherical conceptual model for parent behaviour. Child Dev 39(4):1229. https://doi.org/10.2307/1127287
7. Schaefer ES (1965) Children's reports of parental behavior: an inventory. Child Dev 36(2):413. https://doi.org/10.2307/1126465
8. Armentrout JA, Burger GK (1972) Children's reports of parental child-rearing behavior at five grade levels. Dev Psychol 7(1):44–48. https://doi.org/10.1037/h0032701
9. Soenens B, Vansteenkiste M (2010) A theoretical upgrade of the concept of parental psychological control: proposing new insights on the basis of self-determination theory. Dev Rev 30(1):74–99. https://doi.org/10.1016/j.dr.2009.11.001
10. Grolnick WS, Pomerantz EM (2009) Issues and challenges in studying parental control: toward a new conceptualization. Child Dev Perspect 3(3):165–170. https://doi.org/10.1111/j.1750-8606.2009.00099.x
11. Steinberg L (2001) We know some things: parent-adolescent relationships in retrospect and prospect. J Res Adolesc 11(1):1–19. https://doi.org/10.1111/1532-7795.00001
12. Dishion TJ, McMahon RJ (1998) Parental monitoring and the prevention of child and adolescent problem behavior: a conceptual and empirical formulation. Clin Child Fam Psychol Rev 1(1):61–75. https://doi.org/10.1023/A:1021800432380
13. Barber BK (1996) Parental psychological control: revisiting a neglected construct. Child Dev 67(6):3296–3319. https://doi.org/10.1111/j.1467-8624.1996.tb01915.x
14. Barber BK, Maughan SL, Olsen JA (2005) Patterns of parenting across adolescence. New Dir Child Adolesc Dev 108:5–16. https://doi.org/10.1002/cd.124
15. Schneewind K (1995) Kinder und Jugendliche im Kontext der Familie: Strategien für eine entwicklungsförderliche Erziehung [Children and adolescents within the context of the family: Strategies for an education that is fostering development.]. In: W. Edelstein (ed) Entwicklungskrisen kompetent meistern: Der Beitrag der Selbstwirksamkeitstheorie von Albert Bandura zum pädagogischen Handeln [Competent coping with developmental crises. The contribution of the theory of self-efficacy by Albert Bandura to educational performance]. Asanger, Heidelberg, pp 43–51
16. Reitz E, Deković M, Meijer AM (2006) Relations between parenting and externalizing and internalizing problem behaviour in early adolescence: child behaviour as moderator and predictor. J Adolesc 29(3):419–436. https://doi.org/10.1016/j.adolescence.2005.08.003
17. Perris C, Arrindell WA, Eisemann M (1994) Parenting and psychopathology. Wiley, New York
18. Luyckx K, Tildesley EA, Soenens B et al (2011) Parenting and trajectories of children's maladaptive behaviors: a 12-year prospective community study. J Clin Child Adolesc Psychol 40(3):468–478. https://doi.org/10.1080/15374416.2011.563470
19. Kawash GF, Kerr EN, Clewes JL (1985) Self-esteem in children as a function of perceived parental behavior. J Psychol 119(3):235–242. https://doi.org/10.1080/00223980.1985.10542893
20. Reitzle M, Winkler Metzke C, Steinhausen H-C (2001) Eltern und Kinder: Der Zürcher Kurzfragebogen zum Erziehungsverhalten (ZKE) [Parents and children: the Zurich brief inventory

of parenting behavior]. Diagnostica 47(4):196–207. https://doi.org/10.1026//0012-1924.47.4.196
21. Akse J, Hale WW, Engels RCME et al (2004) Personality, perceived parental rejection and problem behavior in adolescence. Soc Psychiatry Psychiatr Epidemiol 39(12):980–988. https://doi.org/10.1007/s00127-004-0834-5
22. Hale WW, Engels R, Meeus W (2006) Adolescent's perceptions of parenting behaviours and its relationship to adolescent Generalized Anxiety Disorder symptoms. J Adolesc 29(3):407–417. https://doi.org/10.1016/j.adolescence.2005.08.002
23. van der Bruggen CO, Stams GJJM, Bögels SM et al (2010) Parenting behaviour as a mediator between young children's negative emotionality and their anxiety/depression. Inf Child Dev. https://doi.org/10.1002/icd.665
24. Gaylord NK, Kitzmann KM, Coleman JK (2003) Parents' and children's perceptions of parental behavior: associations with children's psychosocial adjustment in the classroom. Parenting 3(1):23–47. https://doi.org/10.1207/S15327922PAR0301_02
25. Rodgers B (1996) Reported parental behaviour and adult affective symptoms. 1. Associations and moderating factors. Psychol Med 26(1):51–61. https://doi.org/10.1017/S0033291700033717
26. Wolfradt U, Hempel S, Miles JN (2003) Perceived parenting styles, depersonalisation, anxiety and coping behaviour in adolescents. Personality Individ Differ 34(3):521–532. https://doi.org/10.1016/S0191-8869(02)00092-2
27. Cui L, Morris AS, Criss MM et al (2014) Parental psychological control and adolescent adjustment: the role of adolescent emotion regulation. Parent Sci Pract 14(1):47–67. https://doi.org/10.1080/15295192.2014.880018
28. Barber BK, Harmon EL (2002) Violating the self: parental psychological control of children and adolescents. In: Barber BK (ed) Intrusive parenting: how psychological control affects children and adolescents. American Psychological Association, Washington, pp 15–52
29. Gutman LM, Feinstein L (2008) Parenting behaviours and children's development from infancy to early childhood: changes, continuities and contributions. Early Child Dev Care 180(4):535–556. https://doi.org/10.1080/03004430802113042
30. Gecas V, Schwalbe ML (1986) Parental behavior and adolescent self-esteem. J Marriage Fam 48(1):37. https://doi.org/10.2307/352226
31. Feinberg ME, Howe GW, Reiss D et al (2000) Relationship between perceptual differences of parenting and adolescent antisocial behavior and depressive symptoms. J Fam Psychol 14(4):531–555. https://doi.org/10.1037/0893-3200.14.4.531
32. Burger GK, Lamp RE, Rogers D (1975) Developmental trends in children's perceptions of parental child-rearing behavior. Dev Psychol 11(3):391. https://doi.org/10.1037/h0076587
33. Keijsers L, Frijns T, Branje SJT et al (2009) Developmental links of adolescent disclosure, parental solicitation, and control with delinquency: moderation by parental support. Dev Psychol 45(5):1314–1327. https://doi.org/10.1037/a0016693
34. Keijsers L, Poulin F (2013) Developmental changes in parent-child communication throughout adolescence. Dev Psychol 49(12):2301–2308. https://doi.org/10.1037/a0032217
35. Paulson SE, Sputa CL (1996) Patterns of parenting during adolescence: perceptions of adolescents and parents. Adolescence 31(122):369
36. Henry CS, Robinson LC, Neal RA et al (2006) Adolescent perceptions of overall family system functioning and parental behaviors. J Child Fam Stud 15(3):308–318. https://doi.org/10.1007/s10826-006-9051-z
37. Shek DTL (2007) A longitudinal study of perceived parental psychological control and psychological well-being in Chinese adolescents in Hong Kong. J Clin Psychol 63(1):1–22. https://doi.org/10.1002/jclp.20331
38. Steinhausen HC, Winkler Metzke C, Meier M et al (1997) Behavioral and emotional problems reported by parents for ages 6 to 17 in a Swiss epidemiological study. Eur Child Adolesc Psychiatry 6(3):136–141. https://doi.org/10.1007/BF00538985
39. Schludermann E, Schludermann S (2010) Replicability of factors in children's report of parent behavior (CRPBI). J Psychol 76(2):239–249. https://doi.org/10.1080/00223980.1970.9916845
40. Reitzle M, Winkler Metzke C, Steinhausen H-C (2011) Der Zürcher Kurzfragebogen zum Erziehungsverhalten (ZKE). Manual. Edition KJP Praxismaterialien (The Zurich Brief Perceived Parental Behavior Inventory (PPBI). Manual.). Department of Child and Adolescent Psychiatry, University of Zurich
41. Singer JD, Willett JB (2003) Applied longitudinal data analysis: modeling change and event occurrence. Oxford University Press, Oxford
42. Ntoumanis N (2014) Analysing longitudinal data with multilevel modelling. Eur Health Psychol 16:40–45
43. Newman DA (2014) Missing data. Organ Res Methods 17(4):372–411. https://doi.org/10.1177/1094428114548590
44. Raudenbush SW, Bryk AS (2010) Hierarchical linear models: Applications and data analysis methods, 2. ed., [Nachdr.]. Advanced quantitative techniques in the social sciences, vol 1. Sage Publ, Thousand Oaks, Calif.
45. Shek DTL, Ma CMS (2011) Longitudinal data analyses using linear mixed models in SPSS: concepts, procedures and illustrations. ScientificWorldJournal 11:42–76. https://doi.org/10.1100/tsw.2011.2
46. Little RJA (1988) A test of missing completely at random for multivariate data with missing values. J Am Stat Assoc 83(404):1198. https://doi.org/10.2307/2290157
47. IBM Corp Released (2015) IBM SPSS Statistics for Windows, Version 23.0. IBM Corp, Armonk, NY
48. Lerner RM, Steinberg LD (eds) (2009) Handbook of adolescent psychology, 3rd edn. Wiley Interscience, Hoboken, NJ
49. Steinhausen H-C, Winkler Metzke C (2001) Risk, compensatory, vulnerability, and protective factors influencing mental health in adolescence. J Youth Adolesc 30(3):259–280. https://doi.org/10.1023/A:1010471210790
50. Steinhausen H-C, Winkler Metzke C (1998) Frequency and correlates of substance use among preadolescents and adolescents in a Swiss epidemiological study. J Child Psychol Psychiat 39(3):387–397. https://doi.org/10.1017/S0021963097002151
51. Steinhausen H-C, Winkler Metzke C (2003) The validity of adolescent types of alcohol use. J Child Psychol Psychiatry 44(5):677–686. https://doi.org/10.1111/1469-7610.00154
52. Steinhausen H-C, Eschmann S, Winkler Metzke C (2007) Continuity, psychosocial correlates, and outcome of problematic substance use from adolescence to young adulthood in a community sample. Child Adolesc Psychiatry Ment Health 1(1):12. https://doi.org/10.1186/1753-2000-1-12
53. Steinhausen H-C, Winkler Metzke C (2000) Adolescent self-rated depressive symptoms in a Swiss epidemiological study. J Youth Adolesc 29(4):427–440. https://doi.org/10.1023/A:1005106409022
54. Steinhausen H-C, Winkler Metzke C (2004) The impact of suicidal ideation in preadolescence, adolescence, and young adulthood on psychosocial functioning and psychopathology in young adulthood. Acta Psychiatr Scand 110(6):438–445. https://doi.org/10.1111/j.1600-0447.2004.00364.x
55. Steinhausen H-C, Bösiger R, Winkler Metzke C (2006) Stability, correlates, and outcome of adolescent suicidal risk. J Child Psychol Psychiatry 47(7):713–722. https://doi.org/10.1111/j.1469-7610.2005.01569.x
56. Putnick DL, Bornstein MH, Hendricks C et al (2008) Parenting stress, perceived parenting behaviors, and adolescent self-concept

in European American families. J Fam Psychol 22(5):752–762. https://doi.org/10.1037/a0013177
57. Gurland ST, Grolnick WS (2005) Perceived threat, controlling parenting, and children's achievement orientations. Motiv Emot 29(2):103–121. https://doi.org/10.1007/s11031-005-7956-2