



Universität  
Basel

Fakultät für  
Psychologie



# Normative Developmental Changes of Social Support, Parental Behaviour and Family Functioning during Adolescence

**Inaugural Dissertation** submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy to the Department of Psychology of the University of Basel by

**Andrea Spitz**

from Sevelen (SG), Switzerland

Basel, 2020



Universität  
Basel

Fakultät für  
Psychologie



Approved by the Department of Psychology at the request of

Prof. Dr. Dr. Hans-Christoph Steinhausen

Prof. Dr. Roselind Lieb

Basel, November 2020

---

Prof. Dr. Jens Gaab (Dean)



## Declaration of Authorship

I, Andrea Spitz (born September 9, 1988), hereby declare that I have written this dissertation without assistance from third parties who are not indicated. I have not used any other sources in the preparation and writing of this dissertation other than those indicated, and I have marked all citations. The published or for publication submitted manuscripts have been created in cooperation with the co-authors. The manuscripts have not been published or submitted by any of the co-authors in another place, nor have they been submitted to another examination committee as qualification work. This concerns the following manuscripts:

- Spitz, A., Winkler Metzke, C., Steinhausen, H.-C. (2020) Development of Perceived Familial and Non-familial Support in Adolescence. Findings from a Community-based Longitudinal Study. *Frontiers in Psychology*, 11: 486915. doi: 10.3389/fpsyg.2020.486915
- Spitz, A., Winkler Metzke, C., Steinhausen, H.-C. (2020) Growth trajectories of perceived parental behaviour during adolescence. *Child Psychiatry and Human Development*. doi: 10.1007/s10578-020-01095-1
- Spitz, A. & Steinhausen, H.-C. (submitted) Development of Family Adaptability and Cohesion from Adolescence to Young Adulthood and Associations with Parental Behaviour.

Basel, 20. November 2020

Andrea Spitz

## Acknowledgements

First and foremost, I wish to thank my supervisor and mentor, Hans-Christoph Steinhausen, for his support, advice, motivation, and especially for his patience throughout these past years. I had the great opportunity to learn from his epidemiological and scientific knowledge and have grown a lot through his constructive feedback and the chance to work with him on a longitudinal project. I have never seen anyone revise manuscripts faster and rephrase in such an eloquent way. I am most grateful that I always felt appreciated by him as a person and as a colleague.

Additionally, I would like to thank Susanne Walitza, who gave me the opportunity to start my new life as a working adult and researcher. I also wish to thank Roselind Lieb for checking on me and offering support, advice and always having an open door for me. Thanks also to Andrea Meyer for helping me with statistical problems and questions.

Further, I wish to thank my colleagues and coworkers at the Department of Child and Adolescent Psychiatry, the Division of Clinical Psychology and Epidemiology and the Outpatient Clinic of the Psychiatry of Baselland for their priceless support. Gerlinde Kerscher, Judith Bühlmann, Alexandra Knobel, Patrizia Hofer, Jae Villanueva, Marcia Rinner, Marcel Miché, Carlotta Heinzl, Eva Weinzierl, Alice Kam, Susi Rigassi thank you so much for the moral support, the coffee breaks, the motivation, the scientific discussions, the mental hygiene, and your kind words. Sadly, my co-worker and co-author Christa Winkler Metzke passed away during the process of this dissertation. Even years after she organized and conducted the assessments of the Zurich Adolescent Psychology and Psychopathology Study, she was still available for questions and supported the extension of the study with her long-standing knowledge. I am most grateful that I had the opportunity to make her acquaintance.

Most importantly, I am very grateful to my friends and family. I am grateful to have an affectionate, uplifting, and loyal "partner in crime". Antonio Esposito always supported me and helped me to sort out the mess in my head and keep going. Thank you for always backing me up. I would also like to thank my mother, Ruth Spitz, who made it possible to choose my own way and pursue my goals. Thanks also to my dear friends who were always there for me, support my resilience and my perseverance, cheer me up in difficult times or distract me and make me enjoy the moment.

## Table of Contents

Acknowledgements .....	IV
Abbreviations .....	VI
Abstract .....	1
Introduction .....	2
Theoretical Background .....	3
Social support .....	4
Parental behaviour .....	5
Family adaptability and cohesion .....	6
Research Questions .....	7
Methods .....	9
Zurich Adolescent Psychology and Psychopathology Study (ZAPPS) .....	9
Participants .....	9
Measures .....	10
Statistical Analyses .....	12
Results .....	14
Changes in Social Support .....	14
Changes in Parental Behaviour .....	16
Changes in Family Functioning .....	17
Discussion .....	18
Strengths and Limitations .....	19
Implications .....	20
References .....	21
Appendix A-C .....	30

## Abbreviations

ASSQ	Adolescent Social Support Questionnaire
FACES	Family Adaptability and Cohesion Evaluation Scales
PPB	Perceived parental behaviour
ICG	Individual growth curve model
T1	First assessment of the ZAPPS (1993)
T2	Second assessment of the ZAPPS (1997)
T3	Third assessment of the ZAPPS (2001)
ZAPPS	Zurich Adolescent Psychology and Psychopathology Study

## **Abstract**

Previous research has found that social support, parental behaviour and family adaptability and cohesion are associated with psychological and psychopathological outcomes. However, there is less research addressing the normative developmental changes in the perception of these influential social factors, especially with longitudinal designs. The aim of this thesis was to present basic knowledge about the normative changes in social support, parental behaviour, and family functioning from preadolescence to late adolescence in a longitudinal setting. The study used data based on the Zurich Adolescent Psychology and Psychopathology Study, a representative sample of 1110 Swiss adolescents that were followed up at three assessment times. The sample size varied between  $n = 857$  and  $n = 552$  depending on the statistical methods. Questionnaires concerning the frequency of and satisfaction with social support including different support sources, perceived parental acceptance, psychological control and structure, were assessed at all three measurement times. Family cohesion and adaptability measures were assessed at two measurement times. Results showed that adolescents sought less support from parents or grandparents and perceived it as less satisfactory as they grew older. Perceived support frequency from friends and romantic partners increased until middle adolescence while the perceived satisfaction increased from middle to late adolescence. Furthermore, there were no changes in perceived parental acceptance but both perceived psychological control and structure declined during adolescence. Family adaptability did not change during adolescence, while family cohesion did decline during adolescence. These results demonstrate normative adolescent development and detachment processes from their families towards greater autonomy, which includes the development of stronger ties with peer groups, the strengthening of social bonds outside the family, independence from care takers while still benefiting from satisfying support and acceptance in an adaptable family setting.

## Introduction

Developmental processes, especially in transitional phases like adolescence, have been of great interest among developmental and epidemiological researchers. The start of this transitional phase is marked by biological changes. When puberty begins, multiple maturing processes are set in motion, such as physical and hormonal changes, which also lead to cognitive, psychological and behavioural development (Grob & Jaschinski, 2003). Developmental goals during adolescence are to improve cognitive skills such as decision making, form an individual identity, and develop autonomy (Siegler, DeLoache, Eisenberg, Pauen, & Grabowski, 2008; Steinberg & Morris, 2001).

During the transition from childhood to adolescence, individuals start to develop a more abstract self-concept and start to view themselves in terms of personal values and integrated into a social context (Grob & Jaschinski, 2003; Harter, 1998). In terms of relationships, adolescents tend to disengage from parental bonds, seeking more autonomy and closer peer relationships. They spend decreasing amounts of time with their parents and more with their peers (Crosnoe, 2000; Manning & Allen, 1987; Sturdevant & Spear, 2002). These increasing alterations, which begin in early adolescence, are generally followed by the deployment of a parent-adolescent relationship that is more equal, less erratic, and is less conflict-prone (Laursen, Coy, & Collins, 1998; Steinberg & Morris, 2001). Whereas the focus of former research has been on individual development and functioning (e.g. biological and hormonal changes, cognitive and identity development, self-esteem, sexual maturation and orientation), research studying the development of adolescents in their social contexts and relationships, including the family and peer group, has been a more recent issue (e.g. Crosnoe, 2000; Steinberg, 2001).

Social support, parental behaviour, and family adaptability and cohesion have been linked to various psychological and psychopathological outcomes. Generally, favorable levels of these factors lead to functional development in children and adolescents. The perception of sufficient and satisfying social support, high acceptant parental behaviour, high structure and monitoring and low psychological pressure or punitive behaviour have been associated with higher self-esteem, lower levels of depression and anxiety symptoms, fewer behavioural difficulties, higher school grades, and better functional coping behaviour and general well-being in adolescents (e.g. Cohen, 2004; Cook, Herman, Phillips, & Settersten, 2002; Cruz, Narciso, Pereira, & Sampaio, 2014; Garnefski & Diekstra, 1996; Gorbett & Kruczek, 2008; Guassi Moreira & Telzer, 2015; Jagers et al., 2015; Levitt, Silver, & Santos, 2007; Parra, Oliva, & Sánchez-Queija, 2015; Piko & Hamvai, 2010; Rueger, Malecki, Pyun, Aycock, & Coyle, 2016).

However, less is known about the normative development and changes of these social behaviours. Changes in familial bonds, dynamics, and functionality and the adolescent demand for more autonomy lead to changes in the perception of the adolescent, which can consequently result in parents adapting their behaviour in response to these demands (Branje, 2018; Steinberg & Morris, 2001). Since this transitional period is a psychologically vulnerable phase, there are also associations between social support, parental behaviour, and family functioning with psychological problems. Thus, it is important to understand developmental changes of this phase, both in the familial and the non-familial domain. To distinguish between normative developmental changes and possible dysfunctional or even clinically relevant variations, studies are needed that display these normative changes.

The present thesis is an attempt to evaluate these basic and normative social changes, especially within the family and with close attachment figures, with the aim to serve as a reference for future clinical and developmental research. Additionally, there is evidence that adolescent self-perception of social factors can vary from that of other observers, such as parents, and is suggested to be more predictive of psychological outcomes (Gaylord, Kitzmann, & Coleman, 2003; Paulson & Spota, 1996; Schaefer, 1965). Therefore, it is also reasonable to assess the normative changes in these concepts with a focus on the adolescent self-perception.

### **Theoretical Background**

The present thesis focuses on three theoretical constructs, namely social support, parental behaviour, and family adaptability and cohesion. Social support describes the provision of instrumental or emotional assistance, help, or comfort between individuals (Brownell & Shumaker, 1984). Parental behaviour includes how parents engage with their offspring, their involvement, their affection towards their children and their parenting strategies (Paulson & Spota, 1996). The two dimensions of family functioning reflect the bonds within the family system and their ability to adapt family structures (Olson, Portner, & Lavee, 1985). In the following, the theoretical background of these constructs in terms of its relevance for the present thesis will be described.

## **Social support**

Familial and peer relationships change during adolescence due to transitions in social and psychological development. While parents are the most important source of social support during childhood, other persons may also provide social support during adolescence (e.g. teachers, other relatives, or friends). There is also evidence that the frequency of supportive interactions with adults decrease with increasing age of adolescent boys and girls (Montemayor & van Komen, 1980). Research findings over the last decades suggest a decline in the frequency and satisfaction with parental support during adolescence (Cheng & Chan, 2004; Demaray & Malecki, 2002; Helsen, Vollebergh, & Meeus, 2000; Hombrados-Mendieta, Gomez-Jacinto, Dominguez-Fuentes, Garcia-Leiva, & Castro-Travé, 2012)

However, even when adolescents start to seek less assistance from their parents, they still continue to function as effective supporters (Furman & Buhrmester, 1992; Levitt, 2005; Levitt et al., 2007; Markiewicz, Lawford, Doyle, & Haggart, 2006; Nickerson & Nagle, 2016; Rueger et al., 2016). Furman and Buhrmester (1992) assumed that the decline in frequency stagnates until late adolescence or early adulthood. Additional studies suggest that there is a mediating effect of the sex of both the adolescent and the parent on parental support (Colarossi & Eccles, 2003; Frey & Röthlisberger, 1996; Levitt, 2005).

According to some research findings siblings also are an valuable source of support but it is unclear how this support changes over the course of adolescence (Frey & Röthlisberger, 1996; Furman & Buhrmester, 1992). However, there are some studies that have not found any changes in the quality of sibling support from mid- to late adolescence (Branje, van Lieshout, van Aken, & Haselager, 2004; Guan & Fuligni, 2016; Scholte, Lieshout, & Van Aken, 2001). Furthermore, there is some evidence that girls generally perceive support from siblings as more satisfying than boys (Furman & Buhrmester, 1992).

In contrast, support from grandparents play a less important role when compared to other familial support sources. Generally, both adolescent girls and boys consult their grandparents less often as they grow older (Frey & Röthlisberger, 1996; Furman & Buhrmester, 1992)

On the other hand, friends become more important during adolescence (Crosnoe, 2000; Manning & Allen, 1987; McGue, Elkins, Walden, & Iacono, 2005; Rubin, Wojslawowicz, Rose-Krasnor, Booth-LaForce, & Burgess, 2006; Sturdevant & Spear, 2002) including being a more important and frequent source of support (Furman & Buhrmester, 1992). Most studies have demonstrated an increase in perceived support from friends from middle childhood to adolescence

(Cheng & Chan, 2004; Furman & Buhrmester, 1992; Helsen et al., 2000; Hombrados-Mendieta et al., 2012; Hunter & Youniss, 1982). Girls seem to perceive support from friends as more important than boys do (Cheng & Chan, 2004; Colarossi & Eccles, 2003; Demaray & Malecki, 2002; Frey & Röthlisberger, 1996; Furman & Buhrmester, 1992).

Furthermore, the presence of romantic partners may influence the need for support from friends or family members. Romantic partners are perceived as more supportive with older age and adolescent boys tend to rate their romantic partners as more supportive than girls (Furman & Buhrmester, 1992).

Teachers also provide support and may even provide certain kinds of support such as help with school related problems or questions, especially in preadolescents (Wang, Brinkworth, & Eccles, 2013). Empirical studies mostly indicated a decrease in perceived teacher support during adolescence (Bokhorst, Sumter, & Westenberg, 2010; Furman & Buhrmester, 1992; Malecki & Demaray, 2002; Martínez, Aricak, Graves, Peters-Myszak, & Nellis, 2011). Boys report receiving generally less support from teachers than girls do (Martínez et al., 2011; Rueger, Malecki, & Demaray, 2010), but this effect possibly only occurs in preadolescents (Furman & Buhrmester, 1992).

### **Parental behaviour**

The number of studies addressing normative changes of parental behaviour in adolescence is limited. In addition, a synopsis of the respective findings is hampered by the fact that there are some inconsistencies in the terminology used to describe the dimensions of parental behaviour. However, most researchers show some agreement in the content of the two or three concepts predominantly described in the studies. Commonly, there is one major dimension characterized by parental warmth, acceptance, supportive behaviour, and emotional accessibility. This dimension is generally positively related with positive psychological outcomes in adolescents. The second dimension includes the extent to which parents use psychological control, pressure, domination, and punitive behaviour. Finally, the third dimension reflects behavioural control, parental monitoring, supervision, and structure with clear and comprehensible behavioural rules and consequences.

Feinberg and colleagues suggested that adolescent development may impact the perception of parental behaviour (Feinberg, Howe, Reiss, & Hetherington, 2000). Longitudinal findings by Barber, Maughan and Olsen (2005) of adolescents aged 8-13 showed no linear

changes in the acceptance, psychological control, and parental monitoring dimensions. More recent studies have found a declining pattern for both parental behavioural control and monitoring (Keijsers, Frijns, Branje, & Meeus, 2009; Keijsers & Poulin, 2013; Luyckx et al., 2011), while an older study (Paulson & Sputa, 1996) showed a decline in perceived demandingness in adolescents, which overlaps with the construct of psychological control.

Cross-sectional studies analyzed the three cited dimensions of perceived parental behaviour with samples from grades 2-4 (age 7-10) (Burger, Lamp, & Rogers, 1975) and 4-8 (age 9-14) (Armentrout & Burger, 1972). They found significant differences across grades for all three dimensions and both studies reported a decrease in psychological control. In the older sample, there was also a decrease in perceived acceptance and an increase in rule-making/control (Armentrout & Burger, 1972). Although these studies may provide evidence that perceived parental behaviour changes over time, their significance is limited by their cross-sectional design and their age range.

In addition, Armentrout and Burger (1972) found that boys perceived less parental acceptance and more psychological control than girls in preadolescence. Furthermore, another study found that boys perceived lower levels of parental behavioural control than girls (Keijsers & Poulin, 2013). These results have been supported by other studies (Akse, Hale, Engels, Raaijmakers, & Meeus, 2004; Gaylord et al., 2003; Gecas & Schwalbe, 1986; Henry, Robinson, Neal, & Huey, 2006).

### **Family adaptability and cohesion**

Parra, Oliva and Reina (2015) assumed that families acquire stable family functioning during childhood, but suggested that changes may occur later during normal adolescent development. They found increasing levels of cohesion from early adolescence to emerging adulthood but no changes in adaptability during adolescence. The stability of adaptability was also supported in a cross-sectional study by Scabini and Galimberti (1995). However, other studies found evidence that cohesion levels decreased during adolescence (Baer, 2002; Feldman & Gehringer, 1988).

There are mixed results regarding the potential influences of these changes. Sex may have an impact, but research findings addressing this issue are discordant. Whereas Scabini and Galimberti (1995) concluded that adolescent girls perceive higher levels of cohesion than boys, Jagers et al. (2015) found the opposite. On the other hand, there are also studies that did not find

any sex differences regarding family cohesion at all (Feldman & Gehringer, 1988; Parra, Oliva, & Reina, 2015). Adaptability has not been found to be impacted by adolescents sex (Parra, Oliva, & Reina, 2015; Scabini & Galimberti, 1995). Since family functioning also involves additional family members and their relationships, it is conceivable that variables such as educational level of the parents, socioeconomic status (Mirnics, Vargha, Tóth, & Bagdy, 2010; Tsamparli & Halios, 2019), marital status (Baer, 1999; Waldren, Bell, Sorell, & Peek, 1990), or the presence of other siblings (Byrd, DeRosa, & Craig, 1993; Tsamparli & Halios, 2019) may also exert an influence on the development of family functioning.

### Research Questions

The objective of this dissertation was to examine the adolescent perception of normative changes in social support, parenting behaviour and family functioning, during adolescence. Therefore, the principal question was as follows: “How do adolescent perceptions of intra- and extra-familial relationships and personal interactions change during adolescence”. The following more specific research questions delineated from existing research findings were addressed in three studies as reported in Manuscripts 1–3 and constituting the present thesis (see Appendices A–C).

Manuscript 1: *Development of perceived familial and non-familial support in adolescence. Findings from a community-based longitudinal study.*

**Research Question 1. How does perceived consultation frequency of and satisfaction with social support of different support sources change during adolescence?** The focus of the first manuscript was to analyze perceived longitudinal changes in social support of a wide variety of familial and non-familial support sources during adolescence. The question not only included how often adolescent boys and girls sought support from these sources (consultation frequency) but the assessment of, namely, mothers, fathers, brothers, sisters, grandparents, other relatives, best friends, romantic partners, and teachers. The following specific hypotheses were tested:

(1) The perceived consultation frequency of support from both mothers and fathers would decrease, but the satisfaction would remain stable during adolescence. Girls would perceive support from mothers as more satisfying, while boys would perceive support by fathers as more satisfying.

(2) The perceived consultation frequency of and satisfaction with support provided by siblings would remain stable across time. Girls would experience sibling support as more satisfying than boys.

(3) The perceived consultation frequency of support from grandparents and other relatives would decrease over time. Sex differences were not expected in this domain.

(4) The support from best friends would become increasingly more frequent and perceived as more satisfying during the course of adolescence. Satisfaction would be higher in girls than in boys.

(5) The perceived support by romantic partners would increase with age both in terms of frequency and satisfaction.

(6) The consultation frequency of and satisfaction with perceived teacher support would decrease during adolescence. Furthermore, girls would perceive this support source as more satisfying than boys.

*Manuscript 2: Growth trajectories of perceived parental behaviour during adolescence.*

**Research Question 2. How does perceived parental acceptance, behavioural control, and structure change during adolescence?** The second manuscript addressed changes in three major dimensions of perceived parental behaviour during adolescence. The specific hypotheses were the following:

- (1) There would be no changes in perceived parental acceptance during adolescence.
- (2) The dimensions of perceived behavioural control and structure would decline during adolescence.

*Manuscript 3: Development of family adaptability and cohesion from adolescence to young adulthood and associations with parental behaviour.*

**Research Question 3. How does perceived family adaptability and cohesion change from adolescence to young adulthood?** In the first part of the third manuscript the change of perceived family adaptability and cohesion from late adolescence to young adulthood was addressed. In the analyses, the impact of sex, socioeconomic status, number of siblings, and marital status had on these developmental changes was studied. In the second part, potential

associations between family adaptability and cohesion and perceived parental acceptance, behavioural control and structure was investigated. The following hypotheses were tested:

- (1) Adaptability would remain stable while cohesion levels would decrease from adolescence to young adulthood.
- (2) Marital status, number of siblings, and socioeconomic status would exert a significant influence on changes in perceived adaptability and cohesion during adolescents.
- (3) Higher levels of perceived parental acceptance and structure would predict higher levels of family cohesion and adaptability
- (4) Psychological control would be negatively correlated with both family functioning variables.

## Methods

### **Zurich Adolescent Psychology and Psychopathology Study (ZAPPS)**

The three manuscripts presented in this thesis are based on data from the Zurich Adolescent Psychology and Psychopathology Study (ZAPPS). A representative sample of 1110 Swiss preadolescents and adolescents aged 10 to 17 years participated at the beginning of the longitudinal study in 1993 (T1). Two additional follow-up assessments were conducted in 1997 (T2) and 2001 (T3). Data from the last follow-up 14 years later starting in 2015 (T4) were not used in the manuscripts of the present thesis because the sample was of adult age. The theoretical focus of the study was rooted in developmental psychopathology including the study of risk- and protective factors during adolescence. A large number of publications emerged from this study with various psychopathological and developmental foci (e.g., Aebi, Giger, Plattner, Metzke, & Steinhausen, 2014; In-Albon, Meyer, Metzke, & Steinhausen, 2017; Steinhausen & Metzke, 2000, 2001; Steinhausen, Winkler Metzke, Meier, & Kannenberg, 1997). More details about the ZAPPS design, methods and sampling procedure can be found in a publication by Steinhausen, et al. (1997).

### **Participants**

*Manuscript 1.* The sample consisted of participants who were in their preadolescence (11-12 years) at the first assessment and the overall sample size was 857 with 419 (48.9%) boys and

438 (51.1%) girls. The mean age was 11.47 years ( $SD = 0.5$ ) for T1, 14.57 ( $SD = 0.6$ ) for T2 and 18.13 ( $SD = 0.68$ ) for T3. Since the statistical approach was suitable for unbalanced datasets, the sample included individuals who participated at one assessment ( $n = 305$ ; 35.6%) or two assessments ( $n = 310$ ; 36.2%). The final sample sizes at the three assessments were 416 ( $n = 208$  boys, 50%;  $n = 208$  girls, 50%) at T1; 760 ( $n = 369$ , 48.6% boys;  $n = 391$ , 51.4% girls) at T2, and 475 ( $n = 211$ , 44.4% boys;  $n = 264$ , 55.6% girls) at T3. A majority of the adolescents ( $n = 785$ ; 91.6%) reported to have sister ( $n = 515$ , 60.1%) or a brother ( $n = 505$ , 58.9%) and most of them had at least one living grandparent ( $n = 821$ , 95.8%). Additionally, 555 (64.8%) participants had a romantic partner at some point during the assessments. There were few ethnic differences, whereby 85.8% of the sample were Swiss and a small part were migrants mostly from Southern European countries.

*Manuscript 2.* The same sample as in manuscript 1 was used for the first analyses in this manuscript. However, only adolescents who participated at two or more assessments were included ( $N = 552$ ) without any effect on the conclusion of this manuscript. The mean age was 11.44 ( $SD = .05$ ) at T1, 14.51 ( $SD = 0.59$ ) at T2 and 18.11 ( $SD = 0.71$ ) at T3. As in manuscript 1 the majority of the sample was represented by Swiss individuals ( $n = 523$ , 94.7%). Only 5.3% ( $n = 29$ ) of the participants had experienced a parental divorce during adolescence.

*Manuscript 3.* The sample of this manuscript was also generally based on the sample of manuscript 1. However, the questionnaire assessing family functioning was only administered in the two waves of assessment during adolescence (T2 and T3), which meant that the sample consisted of 619 adolescents. The mean age at T2 was 14.85 ( $SD = 0.08$ ) and at T3 it was 18.45 ( $SD = 0.94$ ). There were significantly more girls in this sample than boys ( $\chi^2 = 11.67$ ,  $p = .001$ ). As in the other manuscripts, most of the participants were Swiss individuals (95.0%,  $n = 588$ ).

## Measures

**Social Support.** Perceived social support from various support sources was measured using the Adolescent Social Support Questionnaire (ASSQ) that had been developed for the ZAPPS (Reitzle, 1993). The questionnaire is based on six hypothetical situations in which adolescents require social support, either emotional or instrumental. These situations include seeking practical help, advice or explanations, sharing of emotions, reporting secret confessions and talking about sexual development. Examples of the hypothetical social situations include the following:

“If you need help with your homework, which person would you ask for help?”

“If you have done something wrong and feel bad, whom would you turn to?”

“If you feel bad and want to share your feelings, who would you talk to?”

For each situation, participants can choose one or more of nine close individuals that are considered potential supporters (mother, father, sister, brother, grandparents, other relatives, girlfriend or boyfriend, best friend, and teacher). For each considered supporter across the six situations, a total consultation frequency score is calculated. Additionally, the perceived satisfaction with the support provided by each of these nine supporters is rated for each situation on a five-point Likert-scale ranging from 0 to 4. For the analyses in manuscript 1, we used a mean satisfaction score of each supporting person across the six situations. Factor analyses across situations revealed two stable dimensions, namely consultation frequency of and satisfaction with social support. Alpha coefficients were ranging from .70 to .87 across the three times of assessment (Winkler Metzke, Reitzle, & H.-C. Steinhausen, 1999).

**Perceived parental behaviour.** This questionnaire was used in the second and third manuscript and was named the Zurich Perceived Parental Behaviour Inventory (PPBI). The inventory was constructed specifically for the ZAPPS on the basis of the Child’s Report of Parental Behaviour Inventory (CRPBI) and the Bronfenbrenner Parental Behaviour Questionnaire (Schaefer, 1965; Schludermann & Schludermann, 2010; Siegelman, 1965). The questionnaire consists of 32 items reflecting three dimensions of parenting behaviour (Reitzle, Winkler Metzke, & Steinhausen, 2001) which were separately assessed for mothers and fathers. Participants rated the specific parental behaviour with a scale ranging from 0 to 3 (from “not true” to “always true”) at all three measurement times. A confirmatory factor analysis with the participants of the ZAPPS confirmed three factors which explained 35% of the variance for fathers and 34% for mothers. There were five items that did not contribute enough to one of the three scales or had low discriminatory power, therefore, these items were excluded from the final calculation of the scales (Reitzle et al., 2001).

The first scale of the PPBI is named “warmth and support” (e. g., “my mother /father praises me when I do something good”) and includes 12 items. This scale reflects positive supportive and caring behaviour, acceptance, high levels of involvement, comforting and encouraging behaviour and emotional accessibility. The second scale is “psychological pressure” (e. g. “my mother / father easily becomes upset if I don’t do what she/he says”) and comprises of nine items. This dimension refers to psychological control and pressure, punishment and rejection.

The third dimension represents “demands and control” (e. g. “my mother / father has clear rules for my behaviour”) including six items. This scale reflects rather behavioural control, structure, supervision, clear rule-setting and monitoring. These scales were identical for maternal and paternal behaviour and were correlated highly ( $r = .71 - .79$ ). The alpha coefficients ranged between  $\alpha = 0.68$  and  $\alpha = 0.89$  at all three assessment times.

**Family functioning.** Functionality within the family system was measured by The Family Adaptability and Cohesion Evaluation Scales (FACES) III by Olson et al. (1985). The questionnaire measures two concepts based on the Circumplex Model of Family Functioning (Olson, Rusell, & Sprenkle, 1979), namely, perceived familial cohesion and adaptability. This questionnaire contains of 20 self-reported items with each question answered on a 5-point scale (from “almost never” to almost always). Adaptability describes the ability of the family system to adequately react and change in response to stressful events. It is structured into four subscales, namely, control/family leadership, discipline, role allocation and rules. Cohesion is defined by the degree of emotional bonding between the family members and comprises of six subscales: emotional bond, family boundaries, time management, friendships, decision making and leisure activities. The two dimensions were replicated in factor analyses based on data from the ZAPPS samples collected in 1997 and 2001. Reliability coefficients amounted to  $\alpha = .61 - .63$  for adaptability and  $\alpha = .86 - .88$  for cohesion.

## Statistical Analyses

*Manuscript 1.* The changes in perceived consultation frequency of adolescents were analysed by a generalized estimating equations model with Poisson distribution considering the specific structure of the count-data. Post-hoc comparisons of estimated marginal means were corrected for multiple testing using the Sidak method, which corrects for familywise error rate and is similar to the Bonferroni method but slightly less conservative.

The development of perceived satisfaction with social support was analysed with a multilevel model, namely, a covariance pattern model treating participants as random effects and sex and time as fixed effects. The dependent variable was the satisfaction with the support from each support source. Post-hoc analyses of estimated marginal means were conducted to detect the structure of time or sex differences.

These statistical models allow the use of unbalanced datasets and include participants with missing waves (Ntoumanis, 2014; Singer & Willett, 2003). The estimated individual time trends

are based on available data for each participant adjusted by the information from other participants (Gibbons et al., 1993). Therefore, the data is not biased due to systematic deletions (Newman, 2014).

*Manuscript 2.* 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 (Ntoumanis, 2014; Singer & Willett, 2003). Due to this approach, the data is not biased due to systematic exclusion (Newman, 2014). 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 (Raudenbush & Bryk, 2010). An ICC of .25 or above favors ICG over a more traditional method for estimating fixed effects.

To conduct these analyses, we followed the procedure by Singer and Willet (2003) as summarized by Shek and Ma (2011). 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" (Little, 1988).

*Manuscript 3.* A series of repeated measures two-factorial analyses of variance (ANOVA) were computed to study changes in family structure from adolescence to young adulthood with adaptability and cohesion scores as dependent measures. In each analysis, time was considered as the first dichotomized (1997 and 2001) factor while sex, SES, number of siblings, and the presence

of parental divorce were separately analyzed each as the second stratified factor with a potential additional impact.

In the second part of the analyses, linear regression models were conducted for each assessment to predict family adaptability and cohesion scores based on the three parental behaviour scales. Besides sex, the social variables of SES, number of siblings, and marital status were also included in the regression models. Missing values occurred only among the parental behaviour scales and amounted to < 1 % of the subjects. The respective cases were excluded in the analyses.

All statistical analyses were performed using the SPSS-package for Windows version 23 (IBM Corp., 2015.)

## Results

### Changes in Social Support

#### **Research Question 1. How does perceived consultation frequency of and satisfaction with social support of different support sources change during adolescence?**

The results indicated that perceived consultation frequency changed in eight of the nine familial and non-familial support sources (Table 1). Only brothers did not change as a support source. The adolescents consulted both parents and grandparents less frequently with increasing age. However, consultation frequency of fathers decreased significantly from preadolescence to middle adolescence. Regarding the consultation frequency for sisters and best friends, adolescents showed an increase from preadolescence to middle adolescence, but not from middle to late adolescence. Other relatives were consulted most often in middle adolescence. There were also significant sex differences of the perceived consultation frequency provided by both parents (Mother:  $Wald \chi^2 = 21.49, df = 1, p < .001$ ; Father:  $Wald \chi^2 = 27.96, df = 1, p < .001$ ), sisters ( $Wald \chi^2 = 9.53, df = 1, p = .002$ ) and best friends ( $Wald \chi^2 = 97.6, df = 1, p < .001$ ). Same-sex parents were asked more frequently for help and support at all three measurement points. Sisters were consulted more often by girls in preadolescence and middle adolescence. Girls also reported to consult their best friends more often than boys during adolescence. There was no significant time by sex interaction.

Results regarding changes in perceived satisfaction showed that there were significant time effects of satisfaction with social support provided by both parents, sisters, grandparents, best friends and romantic partners (Table 1). While the satisfaction with the perceived support from mothers and grand-parents declined until mid-adolescence, the support from fathers and sisters was perceived as more satisfactory again from middle to late adolescence. Furthermore, satisfaction with social support provided by best friends and romantic partners increased from mid-adolescence to late adolescence. Additionally, there were significant sex differences for the satisfaction provided by mothers ( $F = 16.80, df = 1,674.71, p < .001$ ), siblings (sisters:  $F = 6.09, df = 1,333.83, p = .01$ ; brothers:  $F = 4.5, df = 1,334.48, p = .035$ ), best friends ( $F = 67.53, df = 1,655.07, p < .001$ ), romantic partners ( $F = 10.09, df = 1,337.29, p = .002$  and teachers ( $F = 11.42, df = 1,453.58, p = .001$ ). Girls perceived support from mothers and best friends as more satisfying during adolescence than boys did. They also perceived support from brothers, sisters and romantic partners as more satisfying in middle adolescence than boys. Girls also reported more satisfactory support from teachers in mid- and late adolescence.

**Table 1**

*Time Effects in Perceived Support Consultation Frequencies and Satisfaction of various Sources*

	<i>Consultation Frequencies</i>				<i>Satisfaction</i>			
	Wald $\chi^2$	<i>df</i>	<i>p</i>	Post-hoc tests	<i>F</i>	<i>df</i>	<i>p</i>	Post-hoc tests
MO	69.38	2	<.001	T1>T2>T3	48.37	2,546.16	<.001	T1>T2=T3; T1>T3
FA	35.0	2	<.001	T1>T2=T3	34.96	2,545.05	<.001	T1>T2<T3; T1>T3
SI	11.59	2	.003	T1<T2=T3	8.54	2,274.51	<.001	T1>T2<T3; T1=T3
BR	3.45	2	n.s.	-	2.26	2,243.01	n.s.	-
GP	72.68	2	<.001	T1>T2>T3	11.69	2,292.45	<.001	T1>T2=T3
OR	25.06	2	<.001	T1<T2>T3	2.06	2,308.18	n.s.	-
BF	86.21	2	<.001	T1<T2=T3	28.57	2,570.83	<.001	T1=T2<T3; T1<T3
RP	75.73	2	<.001	T1<T2<T3	3.9	2,273.97	.02	T1=T2<T3; T1<T3
TE	54.08	2	<.001	T1<T2<T3	1.96	2,457.47	n.s.	-

*Note.* MO = Mother, FA = Father, SI = Sister, BR = Brother, GP = Grandparents, OR = Other relative, BF = Best friend, RP = Romantic partner, TE = Teacher, T1 = time 1, T2 = time 2, T3 = time 3

## Changes in Parental Behaviour

### **Research Question 2. How does perceived parental acceptance, psychological control, and structure change during adolescence?**

The intraclass coefficients (ICC) for perceived parental acceptance, psychological control and structure were all above .25 and therefore, the use of the IGC Models was adequate (Shek & Ma, 2011).

The results indicated that perceived maternal and paternal acceptance including sex as a predictor showed no significant time, sex nor interactional effect (table 2). The inclusion of a time variable and sex as predictors did not lead to a significant improvement of the model fit coefficients (maternal acceptance:  $\chi^2(2) = 5.73, p = .06; \Delta AIC = -1.73; \Delta BIC = 11.64$ ; paternal acceptance  $\chi^2(2) = .03, p = .99; \Delta AIC = 3.97; \Delta BIC = 14.23$ ).

For perceived maternal and paternal psychological control, significant main effects of time and sex were found. There was also a significant time by sex interaction for maternal but not for paternal psychological control (see Table 2). Girls and boys experienced a decrease in perceived parental psychological control 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 figure 2). The linear conditional model significantly improved the model fit over the unconditional model (maternal control:  $\chi^2(2) = 11.57, p < .001; \Delta AIC = 52.43; \Delta BIC = 2.8$ ; paternal control  $\chi^2(2) = 9.33, p = .01; \Delta AIC = 5.33; \Delta BIC = 4.92$ ).

Analyses with parental structure showed significant main effects for time and sex for both parents (Table 2). Additionally, there was a significant time by sex interaction, but only for parental structure. The adolescents perceived structure and monitoring behaviour of their parents as declining. Boys experienced more structure from their parents in preadolescence than girls, but this effect vanished in late adolescence. Boys perceived a steeper decrease in paternal structure than girls did. The model fit of the linear conditional model improved significantly over the unconditional model (maternal structure :  $\chi^2(2) = 6.65, p = .04; \Delta AIC = 2.65; \Delta BIC = 7.75$ ; paternal structure :  $\chi^2(2) = 6.25, p = .04; \Delta AIC = 2.2; \Delta BIC = 8.05$ ).

**Table 2***Fixed Effects of IGC Analysis with Perceived Parental Behaviour*

	Mothers								
	Acceptance			Psychological Control			Structure		
	$\beta$	SE	<i>p</i>	$\beta$	SE	<i>p</i>	$\beta$	SE	<i>p</i>
Intercept	25.15	1.22	<.001	10.35	.67	<.001	14.87	.84	<.001
Time	.07	.53	.90	-2.15	.45	<.001	-1.65	.37	<.001
Sex	.58	.77	.45	-1.48	.43	.001	-1.28	.52	.015
Sex*Time	.19	.33	.57	.51	.28	.073	.40	.23	.082
	Fathers								
	Acceptance			Psychological Control			Structure		
	$\beta$	SE	<i>p</i>	$\beta$	SE	<i>p</i>	$\beta$	SE	<i>p</i>
Intercept	24.93	1.37	<.001	11.49	1.02	<.001	14.27	.86	<.001
Time	-.18	.63	.77	-2.03	.43	<.001	-2.06	.38	<.001
Sex	-.11	.86	.90	-1.84	.64	.004	-1.34	.54	.013
Sex*Time	.07	.39	.86	.54	.27	.044	.41	.24	.041

### Changes in Family Functioning

#### Research Question 3. How does perceived family adaptability and cohesion change from adolescence to young adulthood?

The results showed no significant impact of time on adaptability in any of the analyses, indicating that adaptability can be seen as a rather stable construct from adolescence to young adulthood. Neither sex, nor number of siblings, nor parental divorce had a significant main effect on adaptability (table 3). However, there was a significant main effect of SES, meaning higher SES resulted in higher adaptability scores in the sample. There were no interactions between time and the other four variables.

Cohesion on the other hand, showed a significant decline in all analyses during this period. Among the four social variables and sex, only parental divorce showed a significant main effect on decreasing cohesion scores. Additionally, there was a significant interaction with sex and time indicating that boys experienced a stronger decline in cohesion than girls. There were no significant interactions for SES, number of siblings or parental divorce.

The second part of these analyses did not address longitudinal changes but analyses of the cross-sectional associations between family functioning and parental behaviour. Results showed a significant regression equation at both times for adaptability (T1:  $F(7,615) = 23.24, p < .001, R = .20$ ; T2:  $F(7,613) = 24.96, p < .001, R = .21$ ), and cohesion (T1:  $F(7,615) = 84.22, p < .001, R =$

.49 ; T2:  $F(7,613) = 76.03, p < .001, R = .46$ ). In the regression model for adaptability, only perceived parental acceptance was significantly associated at both measurement times (T1:  $\beta = .43, p < .001$ ; T2:  $\beta = .42, p < .001$ ). Cohesion was significantly associated with perceived parental acceptance (T1:  $\beta = .61, p < .001$ ; T2:  $\beta = .63, p < .001$ ), psychological control (T1:  $\beta = -.14, p < .001$ ; T2:  $\beta = -.09, p = .02$ ), and structure (T1:  $\beta = .09, p = .005$ ). However, there was only a trend at the second measurement time for parental structure ( $\beta = .07, p = .05$ ).

**Table 3**

Summary Statistics of Repeated Analyses of Variance for Adaptability and Cohesion

	<i>Adaptability</i>			<i>Cohesion</i>		
	<i>F</i>	<i>df</i>	<i>p</i>	<i>F</i>	<i>df</i>	<i>p</i>
<i>Model A</i>						
Time	1.65	1,617	.20	11.17	1,617	.001
Sex	.79	1,617	.38	.004	1,617	.95
Time*sex	3.03	1,617	.08	5.32	1,617	.02
<i>Model B</i>						
Time	.94	1,615	.33	7.61	1,615	.006
SES	4.04	3,615	.007	.48	3,615	.70
Time*SES	.75	3,615	.52	.56	3,615	.64
<i>Model C</i>						
Time	.79	1,616	.38	7.7	1,616	.006
Number of siblings	.48	2,616	.62	.83	2,616	.44
Time*number of siblings	.28	2,616	.76	.39	2,616	.67
<i>Model D</i>						
Time	3.11	1,617	.08	5.55	1,617	.02
Parental divorce	.22	1,617	.64	9.28	1,617	.002
Time*parental divorce	.78	1,617	.38	.06	1,617	.80

## Discussion

The present study addressed the normative changes of perceived social support, parental behaviour, and family functioning during adolescence. The findings revealed that adolescents consulted their parents and grandparents less often with increasing age while they sought more support from peers and romantic partners. Additionally, satisfaction with social support from parents also declined while they perceived friends as more satisfying supporters during adolescence. However, parents were still considered as very satisfying support sources as predicted by various studies (Demaray & Malecki, 2002; Furman & Buhrmester, 1992; Helsen et al., 2000; Hombrados-Mendieta et al., 2012; Nickerson & Nagle, 2016). The results regarding siblings and perceived support frequency and satisfaction showed inconsistent results. The

stability assumption of consultation frequency and satisfaction, as seen in Scholte et al. (2001), was only true for brothers in the present study. The consultation frequency of teachers increased, and the perceived satisfaction remained stable during adolescence. During adolescence, boys and girls experienced a decline in psychological pressure and structure from both parents, while they perceived acceptance as stable. These results were in line with our hypotheses and mostly supported by studies based on adolescent samples (Barber et al., 2005; Keijsers & Poulin, 2013; Luyckx et al., 2011; Paulson & Spota, 1996). The results regarding the family functioning variables were also in line with our hypotheses and other studies (Baer, 2002; Feldman & Gehring, 1988). Adolescents perceived no change in adaptability but experienced a decline of familial cohesion from middle adolescence to young adulthood.

### **Strengths and Limitations**

The present thesis has the following strengths. The manuscripts profited from a longitudinal dataset and the repeated measures design with large sample sizes from preadolescence to young adulthood. The statistical methods used in the first and second manuscript were suitable in handling missing data in the waves of assessment. In terms of the findings, the present thesis contributes to existing knowledge regarding normative developmental changes of the three concepts of social support, parental behaviour and family functioning.

However, there are also some limitations. The focus of the first and second manuscript was on the changes of social support and parental behaviour. Only sex was considered as predictor, but further social factors, as included in manuscript three, may also have an impact on adolescent perception and changes in these constructs. Likewise, in the third manuscript, there might be other important environmental and social characteristics associated with family functioning such as birth order, remarriage, living with biological parents or foster parents. However, these data were not available for the present analyses but should be considered as a perspective for future research.

In addition, there was only a small heterogeneity in ethnic variance in the longitudinal sample. More than 90% of the sample were comprised of Swiss individuals. Therefore, the conclusions are limited to this culture. The manuscripts allow no statement about a more diverse ethnic population and future research might test for transcultural validity of the findings.

Since the study sample was first assessed in 1993, there might be period effects with some cohort differences in a more recent sample. However, the results for all three manuscripts have

been supported by several studies over the past decades. Therefore, it may be assumed that these changes follow a similar pattern or modify only slowly. Although in general there is not much indication for rapid or major changes in general developmental processes in terms of period effects, it is important that the present results will be replicated by future research based on more recently assessed samples.

## **Implications**

The findings of the present thesis strengthen the body of research on normative developmental changes of social support, parental behaviour, and family functioning variables. During a developmental period of marked transition processes, adolescent girls and boys generally seek less support from family members and perceive their assistance as less satisfying when they grow older. Extra familial supporters, such as friends and romantic partners, are contacted more often and perceived as more satisfying with higher age. During this process, adolescents also experience a change in parental behaviour. While they do not seem to feel less or more accepted by their parents, they experience less psychological control and structure. Additionally, adolescents do not perceive a change in adaptability from middle adolescence to young adulthood, while cohesion decreases. These findings demonstrate normative adolescent detachment processes from families towards greater autonomy which includes the formation and strengthening of peer groups, social bonds, independence from care takers while still benefiting from satisfying support and acceptance in an adaptable family setting.

Future research might include comparisons of clinical and community samples and the exploration of additional determinants of the constructs studied in the present thesis. Additionally, various developmental patterns might be identified and linked to specific normal and abnormal psychological outcomes, including both risk and protective resilience factors. To study these trajectories, further longitudinal designs are needed.

## References

- Aebi, M., Giger, J., Plattner, B., Metzke, C. W., & Steinhausen, H.-C. (2014). Problem coping skills, psychosocial adversities and mental health problems in children and adolescents as predictors of criminal outcomes in young adulthood. *European Child & Adolescent Psychiatry*, 23(5), 283–293. <https://doi.org/10.1007/s00787-013-0458-y>
- Akse, J., Hale, W. W., Engels, R. C. M. E., Raaijmakers, Q. A. W., & Meeus, W. H. J. (2004). Personality, perceived parental rejection and problem behavior in adolescence. *Social Psychiatry and Psychiatric Epidemiology*, 39(12), 980–988. <https://doi.org/10.1007/s00127-004-0834-5>
- Armentrout, J. A., & Burger, G. K. (1972). Children's reports of parental child-rearing behavior at five grade levels. *Developmental psychology*, 7(1), 44–48. <https://doi.org/10.1037/h0032701>
- Baer, J. (1999). The effects of family structure and SES on family processes in early adolescence. *Journal of Adolescence*, 22(3), 341–354. <https://doi.org/10.1006/jado.1999.0226>
- Baer, J. (2002). Is Family Cohesion a Risk or Protective Factor During Adolescent Development? *Journal of Marriage and Family*, 64(3), 668–675. <https://doi.org/10.1111/j.1741-3737.2002.00668.x>
- Barber, B. K., Maughan, S. L., & Olsen, J. A. (2005). Patterns of parenting across adolescence. *New Directions for Child and Adolescent Development*. (108), 5–16. <https://doi.org/10.1002/cd.124>
- Bokhorst, C. L., Sumter, S. R., & Westenberg, P. M. (2010). Social Support from Parents, Friends, Classmates, and Teachers in Children and Adolescents Aged 9 to 18 Years: Who Is Perceived as Most Supportive? *Social Development*, 19(2), 417–426. <https://doi.org/10.1111/j.1467-9507.2009.00540.x>
- Branje, S. (2018). Development of Parent-Adolescent Relationships: Conflict Interactions as a Mechanism of Change. *Child Development Perspectives*, 12(3), 171–176. <https://doi.org/10.1111/cdep.12278>
- Branje, S. J. T., van Lieshout, C. F. M., van Aken, M. A. G., & Haselager, G. J. T. (2004). Perceived support in sibling relationships and adolescent adjustment. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, 45(8), 1385–1396. <https://doi.org/10.1111/j.1469-7610.2004.00845.x>

- Brownell, A., & Shumaker, S. A. (1984). Social Support: An Introduction to a Complex Phenomenon. *Journal of Social Issues, 40*(4), 1–9. <https://doi.org/10.1111/j.1540-4560.1984.tb01104.x>
- Burger, G. K., Lamp, R. E., & Rogers, D. (1975). Developmental trends in children's perceptions of parental child-rearing behavior. *Developmental psychology, 11*(3), 391. <https://doi.org/10.1037/h0076587>
- Byrd, B., DeRosa, A. P., & Craig, S. S. (1993). The adult who is an only child: achieving separation or individuation. *Psychological Reports, 73*(1), 171–177. <https://doi.org/10.2466/pr0.1993.73.1.171>
- Cheng, S.-T., & Chan, A. C. (2004). The multidimensional scale of perceived social support: Dimensionality and age and gender differences in adolescents. *Personality and Individual Differences, 37*(7), 1359–1369. <https://doi.org/10.1016/j.paid.2004.01.006>
- Cohen, S. (2004). Social relationships and health. *The American Psychologist, 59*(8), 676–684. <https://doi.org/10.1037/0003-066X.59.8.676>
- Colarossi, L. G., & Eccles, J. S. (2003). Differential effects of support providers on adolescents' mental health. *Social Work Research, 27*(1), 19–30.
- Cook, T. D., Herman, M. R., Phillips, M., & Settersten, R. A. (2002). Some ways in which neighborhoods, nuclear families, friendship groups, and schools jointly affect changes in early adolescent development. *Child Development, 73*(4), 1283–1309. <https://doi.org/10.1111/1467-8624.00472>
- Crosnoe, R. (2000). Friendships in Childhood and Adolescence: The Life Course and New Directions. *Social Psychology Quarterly, 63*(4), 377. <https://doi.org/10.2307/2695847>
- Cruz, D., Narciso, I., Pereira, C. R., & Sampaio, D. (2014). Risk Trajectories of Self-Destructiveness in Adolescence: Family Core Influences. *Journal of Child and Family Studies, 23*(7), 1172–1181. <https://doi.org/10.1007/s10826-013-9777-3>
- Demaray, M. K., & Malecki, C. K. (2002). The relationship between perceived social support and maladjustment for students at risk. *Psychology in the Schools, 39*(3), 305–316. <https://doi.org/10.1002/pits.10018>
- Feinberg, M. E., Howe, G. W., Reiss, D., & Hetherington, E. M. (2000). Relationship between perceptual differences of parenting and adolescent antisocial behavior and depressive symptoms. *Journal of Family Psychology, 14*(4), 531–555. <https://doi.org/10.1037/0893-3200.14.4.531>

- Feldman, S. S., & Gehringer, T. M. (1988). Changing Perceptions of Family Cohesion and Power across Adolescence. *Child Development, 59*(4), 1034. <https://doi.org/10.2307/1130269>
- Frey, C. U., & Röthlisberger, C. (1996). Social support in healthy adolescents. *Journal of Youth and Adolescence, 25*(1), 17–31. <https://doi.org/10.1007/BF01537378>
- Furman, W., & Buhrmester, D. (1992). Age and Sex Differences in Perceptions of Networks of Personal Relationships. *Child Development, 63*(1), 103. <https://doi.org/10.2307/1130905>
- Garnefski, N., & Diekstra, R. F. (1996). Perceived social support from family, school, and peers: relationship with emotional and behavioral problems among adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry, 35*(12), 1657–1664. <https://doi.org/10.1097/00004583-199612000-00018>
- Gaylord, N. K., Kitzmann, K. M., & Coleman, J. K. (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](https://doi.org/10.1207/S15327922PAR0301_02)
- Gecas, V., & Schwalbe, M. L. (1986). Parental Behavior and Adolescent Self-Esteem. *Journal of Marriage and the Family, 48*(1), 37. <https://doi.org/10.2307/352226>
- Gibbons, R. D., Hedeker, D., Elkin, I., Wateraux, C., Kraemer, H. C., Greenhouse, J. B., . . . Watkins, J. T. (1993). Some conceptual and statistical issues in analysis of longitudinal psychiatric data. Application to the NIMH treatment of Depression Collaborative Research Program dataset. *Archives of General Psychiatry, 50*(9), 739–750. <https://doi.org/10.1001/archpsyc.1993.01820210073009>
- Gorbett, K., & Kruczek, T. (2008). Family Factors Predicting Social Self-Esteem in Young Adults. *The Family Journal, 16*(1), 58–65. <https://doi.org/10.1177/1066480707309603>
- Grob, A., & Jaschinski, U. (2003). *Erwachsen werden: Entwicklungspsychologie des Jugendalters* (1. Auflage). *Grundlagen Psychologie*. Weinheim: Beltz. Retrieved from [http://www.content-select.com/index.php?id=bib\\_view&ean=9783621278386](http://www.content-select.com/index.php?id=bib_view&ean=9783621278386)
- Guan, S.-S. A., & Fuligni, A. J. (2016). Changes in Parent, Sibling, and Peer Support During the Transition to Young Adulthood. *Journal of Research on Adolescence, 26*(2), 286–299. <https://doi.org/10.1111/jora.12191>
- Guassi Moreira, J. F., & Telzer, E. H. (2015). Changes in family cohesion and links to depression during the college transition. *Journal of Adolescence, 43*, 72–82. <https://doi.org/10.1016/j.adolescence.2015.05.012>

- Harter, S. (1998). The development of self-representations. In *Handbook of child psychology: Social, emotional, and personality development, Vol. 3, 5th ed* (pp. 553–617). Hoboken, NJ, US: John Wiley & Sons, Inc.
- Helsen, M., Vollebergh, W., & Meeus, W. (2000). Social Support from Parents and Friends and Emotional Problems in Adolescence. *Journal of Youth and Adolescence, 29*(3).
- Henry, C. S., Robinson, L. C., Neal, R. A., & Huey, E. L. (2006). Adolescent perceptions of overall family system functioning and parental behaviors. *Journal of Child and Family Studies, 15*(3), 308–318. <https://doi.org/10.1007/s10826-006-9051-z>
- Hombrados-Mendieta, M. I., Gomez-Jacinto, L., Dominguez-Fuentes, J. M., Garcia-Leiva, P., & Castro-Travé, M. (2012). TYPES OF SOCIAL SUPPORT PROVIDED BY PARENTS, TEACHERS, AND CLASSMATES DURING ADOLESCENCE. *Journal of Community Psychology, 40*(6), 645–664. <https://doi.org/10.1002/jcop.20523>
- Hunter, F. T., & Youniss, J. (1982). Changes in functions of three relations during adolescence. *Developmental psychology, 18*(6), 806–811. <https://doi.org/10.1037/0012-1649.18.6.806>
- IBM Corp. Released 2015. IBM SPSS Statistics for Windows (Version Version 23.0) [Computer software]. Armonk, NY: IBM Corp.
- In-Albon, T., Meyer, A. H., Metzke, C. W., & Steinhausen, H.-C. (2017). A Cross-Lag Panel Analysis of Low Self-Esteem as a Predictor of Adolescent Internalizing Symptoms in a Prospective Longitudinal Study. *Child Psychiatry and Human Development, 48*(3), 411–422. <https://doi.org/10.1007/s10578-016-0668-x>
- Jaggers, J. W., Church, W. T., Tomek, S., Hooper, L. M., Bolland, K. A., & Bolland, J. M. (2015). Adolescent Development as a Determinant of Family Cohesion: A Longitudinal Analysis of Adolescents in the Mobile Youth Survey. *Journal of Child and Family Studies, 24*(6), 1625–1637. <https://doi.org/10.1007/s10826-014-9966-8>
- Keijsers, L., Frijns, T., Branje, S. J. T., & Meeus, W. (2009). Developmental links of adolescent disclosure, parental solicitation, and control with delinquency: moderation by parental support. *Developmental Psychology, 45*(5), 1314–1327. <https://doi.org/10.1037/a0016693>
- Keijsers, L., & Poulin, F. (2013). Developmental changes in parent-child communication throughout adolescence. *Developmental Psychology, 49*(12), 2301–2308. <https://doi.org/10.1037/a0032217>

- Laursen, B., Coy, K. C., & Collins, W. A. (1998). Reconsidering Changes in Parent-Child Conflict across Adolescence: A Meta-Analysis. *Child Development, 69*(3), 817–832. <https://doi.org/10.1111/j.1467-8624.1998.tb06245.x>
- Levitt, M. J. (2005). Social Relations in Childhood and Adolescence: The Convoy Model Perspective. *Human Development, 48*(1-2), 28–47. <https://doi.org/10.1159/000083214>
- Levitt, M. J., Silver, M. E., & Santos, J. D. (2007). Adolescents in Transition to Adulthood: Parental Support, Relationship Satisfaction, and Post-transition Adjustment. *Journal of Adult Development, 14*(1-2), 53–63. <https://doi.org/10.1007/s10804-007-9032-5>
- Little, R. J. A. (1988). A Test of Missing Completely at Random for Multivariate Data with Missing Values. *Journal of the American Statistical Association, 83*(404), 1198. <https://doi.org/10.2307/2290157>
- Luyckx, K., Tildesley, E. A., Soenens, B., Andrews, J. A., Hampson, S. E., Peterson, M., & Duriez, B. (2011). Parenting and trajectories of children's maladaptive behaviors: a 12-year prospective community study. *Journal of Clinical Child and Adolescent Psychology : the Official Journal for the Society of Clinical Child and Adolescent Psychology, American Psychological Association, Division 53, 40*(3), 468–478. <https://doi.org/10.1080/15374416.2011.563470>
- Malecki, C. K., & Demaray, M. K. (2002). Measuring perceived social support: Development of the child and adolescent social support scale (CASSS). *Psychology in the Schools, 39*(1).
- Manning, M. L., & Allen, M. G. (1987). Social Development in Early Adolescence: Implications for Middle School Educators. *Childhood Education, 63*(3), 172–176. <https://doi.org/10.1080/00094056.1987.10520782>
- Markiewicz, D., Lawford, H., Doyle, A. B., & Haggart, N. (2006). Developmental Differences in Adolescents' and Young Adults' Use of Mothers, Fathers, Best Friends, and Romantic Partners to Fulfill Attachment Needs. *Journal of Youth and Adolescence, 35*(1), 121–134. <https://doi.org/10.1007/s10964-005-9014-5>
- Martínez, R. S., Aricak, O. T., Graves, M. N., Peters-Myszak, J., & Nellis, L. (2011). Changes in perceived social support and socioemotional adjustment across the elementary to junior high school transition. *Journal of Youth and Adolescence, 40*(5), 519–530. <https://doi.org/10.1007/s10964-010-9572-z>

- McGue, M., Elkins, I., Walden, B., & Iacono, W. G. (2005). Perceptions of the parent-adolescent relationship: a longitudinal investigation. *Developmental Psychology, 41*(6), 971–984. <https://doi.org/10.1037/0012-1649.41.6.971>
- Mirnic, Z., Vargha, A., Tóth, M., & Bagdy, E. (2010). Cross-Cultural Applicability of FACES IV. *Journal of Family Psychotherapy, 21*(1), 17–33. <https://doi.org/10.1080/08975351003618577>
- Montemayor, R., & van Komen, R. (1980). Age segregation of adolescents in and out of school. *Journal of Youth and Adolescence, 9*(5), 371–381. <https://doi.org/10.1007/BF02087675>
- Newman, D. A. (2014). Missing Data. *Organizational Research Methods, 17*(4), 372–411. <https://doi.org/10.1177/1094428114548590>
- Nickerson, A. B., & Nagle, R. J. (2016). Parent and Peer Attachment in Late Childhood and Early Adolescence. *The Journal of Early Adolescence, 25*(2), 223–249. <https://doi.org/10.1177/0272431604274174>
- Ntoumanis, N. (2014). Analysing longitudinal data with multilevel modelling. *The European Health Psychologist, 16*(1), 40–45.
- Olson, D., Rusell, C., & Sprenkle, D. (1979). Circumplex model of family functioning. *Handbook in Family Medicine.*
- Olson, D. H., Portner, J., & Lavee, Y. (1985). Family adaptability and cohesion evaluation scales (FACES III). *St. Paul: University of Minnesota, Family Social Science.*
- Parra, A., Oliva, A., & Reina, M. d. C. (2015). Family Relationships From Adolescence to Emerging Adulthood. *Journal of Family Issues, 36*(14), 2002–2020. <https://doi.org/10.1177/0192513X13507570>
- Parra, A., Oliva, A., & Sánchez-Queija, I. (2015). Development of emotional autonomy from adolescence to young adulthood in Spain. *Journal of Adolescence, 38*, 57–67. <https://doi.org/10.1016/j.adolescence.2014.11.003>
- Paulson, S. E., & Sputa, C. L. (1996). Patterns of parenting during adolescence: perceptions of adolescents and parents. *Adolescence, 31*(122), 369–381.
- Piko, B. F., & Hamvai, C. (2010). Parent, school and peer-related correlates of adolescents' life satisfaction. *Children and Youth Services Review, 32*(10), 1479–1482. <https://doi.org/10.1016/j.childyouth.2010.07.007>

- Raudenbush, S. W., & Bryk, A. S. (2010). *Hierarchical linear models: Applications and data analysis methods* (2. ed., [Nachdr.]). *Advanced quantitative techniques in the social sciences: Vol. 1*. Thousand Oaks, Calif.: Sage Publ.
- Reitzle, M. (1993). *Konstruktion eines Fragebogens zur Erfassung der Grösse und Effizienz des Sozialen Netzwerks.: Psychiatrische Universitäts-Poliklinik für Kinder und Jugendliche: Unveröffentlichtes Manuskript*. [Construction of a questionnaire for measuring the size and efficiency of the social network. Department of Child and Adolescent Psychiatry, Unpublished Manuscript], Zurich, Switzerland.
- Reitzle, M., Winkler Metzke, C., & Steinhausen, H.-C. (2001). Eltern und Kinder: Der Zürcher Kurzfragebogen zum Erziehungsverhalten (ZKE). *Diagnostica*, 47(4), 196–207.  
<https://doi.org/10.1026//0012-1924.47.4.196>
- Rubin, K. H., Wojslawowicz, J. C., Rose-Krasnor, L., Booth-LaForce, C., & Burgess, K. B. (2006). The best friendships of shy/withdrawn children: prevalence, stability, and relationship quality. *Journal of Abnormal Child Psychology*, 34(2), 143–157.  
<https://doi.org/10.1007/s10802-005-9017-4>
- Rueger, S. Y., Malecki, C. K., & Demaray, M. K. (2010). Relationship between multiple sources of perceived social support and psychological and academic adjustment in early adolescence: comparisons across gender. *Journal of Youth and Adolescence*, 39(1), 47–61.  
<https://doi.org/10.1007/s10964-008-9368-6>
- Rueger, S. Y., Malecki, C. K., Pyun, Y., Aycock, C., & Coyle, S. (2016). A meta-analytic review of the association between perceived social support and depression in childhood and adolescence. *Psychological Bulletin*, 142(10), 1017–1067.  
<https://doi.org/10.1037/bul0000058>.
- Scabini, E., & Galimberti, C. (1995). Adolescents and young adults: A transition in the family. *Journal of adolescence*, 18(5), 593–606. <https://doi.org/10.1006/jado.1995.1041>
- Schaefer, E. S. (1965). Children's Reports of Parental Behavior: An Inventory. *Child Development*, 36(2), 413. <https://doi.org/10.2307/1126465>
- Schludermann, E., & Schludermann, S. (2010). Replicability of Factors in Children's Report of Parent Behavior (CRPBI). *The Journal of Psychology*, 76(2), 239–249.  
<https://doi.org/10.1080/00223980.1970.9916845>

- Scholte, R., Lieshout, C., & Van Aken, M. (2001). Perceived Relational Support in Adolescence: Dimensions, Configurations, and Adolescent Adjustment. *Journal Of Research On Adolescence (Wiley-Blackwell)*, *11*(1), 71.
- Shek, D. T. L., & Ma, C. M. S. (2011). Longitudinal data analyses using linear mixed models in SPSS: concepts, procedures and illustrations. *TheScientificWorldJournal*, *11*, 42–76. <https://doi.org/10.1100/tsw.2011.2>
- Siegelman, M. (1965). Evaluation of Bronfenbrenner's Questionnaire for Children concerning Parental Behavior. *Child Development*, *36*(1), 163. <https://doi.org/10.2307/1126788>
- Siegler, R. S., DeLoache, J. S., Eisenberg, N., Pauen, S., & Grabowski, J. (Eds.) (2008). *Entwicklungspsychologie im Kindes- und Jugendalter* ([Nachdr.]). Heidelberg: Spektrum Akad. Verl. Retrieved from [http://deposit.dnb.de/cgi-bin/dokserv?id=2652178&prov=M&dok\\_var=1&dok\\_ext=htm](http://deposit.dnb.de/cgi-bin/dokserv?id=2652178&prov=M&dok_var=1&dok_ext=htm)
- Singer, J. D., & Willett, J. B. (2003). *Applied longitudinal data analysis: Modeling change and event occurrence*. Oxford: Oxford Univ. Press. Retrieved from <http://www.loc.gov/catdir/enhancements/fy0612/2002007055-d.html>
- Steinberg, L., & Morris, A. S. (2001). Adolescent development. *Annual Review of Psychology*, *52*, 83–110. <https://doi.org/10.1146/annurev.psych.52.1.83>
- Steinberg, L. (2001). We Know Some Things: Parent-Adolescent Relationships in Retrospect and Prospect. *Journal of Research on Adolescence*, *11*(1), 1–19. <https://doi.org/10.1111/1532-7795.00001>
- Steinhausen, H. C., Winkler Metzke, C., Meier, M., & Kannenberg, R. (1997). Behavioral and emotional problems reported by parents for ages 6 to 17 in a Swiss epidemiological study. *European Child & Adolescent Psychiatry*, *6*(3), 136–141. <https://doi.org/10.1007/BF00538985>
- Steinhausen, H.-C., & Winkler Metzke, C. (2000). Adolescent Self-Rated Depressive Symptoms in a Swiss Epidemiological Study. *Journal of Youth and Adolescence*, *29*(4), 427–440. <https://doi.org/10.1023/A:1005106409022>
- Steinhausen, H.-C., & Winkler Metzke, C. (2001). Risk, Compensatory, Vulnerability, and Protective Factors Influencing Mental Health in Adolescence. *Journal of Youth and Adolescence*, *30*(3), 259–280. <https://doi.org/10.1023/A:1010471210790>

- Sturdevant, M. S., & Spear, B. (2002). Adolescent Psychosocial Development. *Journal of the American Dietetic Association*, 102(3), S30-S31. [https://doi.org/10.1016/s0002-8223\(02\)90419-0](https://doi.org/10.1016/s0002-8223(02)90419-0)
- Tsamparli, A., & Halios, H. (2019). Quality of sibling relationship and family functioning in Greek families with school-age children. *Journal of Psychologists and Counsellors in Schools*, 29(2), 190–205. <https://doi.org/10.1017/jgc.2019.9>
- Waldren, T., Bell, N. J., Sorell, G., & Peek, C. (1990). Cohesion and Adaptability in Post-Divorce Remarried and First Married Families. *Journal of Divorce & Remarriage*, 14(1), 13–28. [https://doi.org/10.1300/J087v14n01\\_03](https://doi.org/10.1300/J087v14n01_03)
- Wang, M.-T., Brinkworth, M., & Eccles, J. (2013). Moderating effects of teacher-student relationship in adolescent trajectories of emotional and behavioral adjustment. *Developmental Psychology*, 49(4), 690–705. <https://doi.org/10.1037/a0027916>
- Winkler Metzke, C., Reitzle, M., & H.-C. Steinhausen (1999). *Das soziale Netzwerk Jugendlicher: Entwicklung eines Messinstruments und Empirische Ergebnisse: Zentrum für Kinder- und Jugendpsychiatrie, Universität Zürich: Unveröffentlichtes Manuskript*. [The social network of adolescents: Development of an assessment device and empirical findings. Department of Child and Adolescent Psychiatry. Unpublished Manuscript], Zurich, Switzerland.

**Appendix A (Manuscript 1)**

**Development of Perceived Familial and Non-Familial Support in Adolescence. Findings  
from a Community-based Longitudinal Study.**

Andrea Spitz, Christa Winkler Metzke, Hans-Christoph Steinhausen

published in *Frontiers in Psychology*, 11: 486915.

doi: [10.3389/fpsyg.2020.486915](https://doi.org/10.3389/fpsyg.2020.486915)



# Development of Perceived Familial and Non-familial Support in Adolescence; Findings From a Community-Based Longitudinal Study

Andrea Spitz<sup>1,2\*</sup>, Christa Winkler Metzke<sup>1</sup> and Hans-Christoph Steinhausen<sup>1,2,3</sup>

<sup>1</sup> Department of Child and Adolescent Psychiatry, University Hospital of Psychiatry, Zurich, Switzerland, <sup>2</sup> Department of Psychology, Clinical Psychology and Epidemiology, University of Basel, Basel, Switzerland, <sup>3</sup> Department of Child and Adolescent Psychiatry, University of Southern Denmark, Odense, Denmark

## OPEN ACCESS

### Edited by:

Kai S. Cortina,  
University of Michigan, United States

### Reviewed by:

Kristel Thomassin,  
University of Guelph, Canada  
Chelsea Reaume,  
University of Guelph, Canada  
in collaboration with KT  
Jennifer Connolly,  
York University, Canada

### \*Correspondence:

Andrea Spitz  
Andrea.spitz@puk.zh.ch

### Specialty section:

This article was submitted to  
Developmental Psychology,  
a section of the journal  
Frontiers in Psychology

**Received:** 28 August 2019

**Accepted:** 18 September 2020

**Published:** 15 October 2020

### Citation:

Spitz A, Winkler Metzke C and  
Steinhausen H-C (2020) Development  
of Perceived Familial and Non-familial  
Support in Adolescence; Findings  
From a Community-Based  
Longitudinal Study.  
*Front. Psychol.* 11:486915.  
doi: 10.3389/fpsyg.2020.486915

There are pronounced developmental changes in perceived social support during adolescence. The present study used the newly developed Adolescent Social Support Questionnaire (ASSQ) to examine both the consultation frequency of, and the satisfaction with perceived social support across adolescence in a longitudinal study focusing on nine different familial and non-familial supporters. The sample of  $N = 857$  adolescents was derived from the Zurich Adolescent Psychology and Psychopathology Study (ZAPPS) and included three measurement time points. Overall, there was a decrease in the perceived frequency and satisfaction from adolescents with social support from both parents and grandparents from preadolescence to late adolescence. Best friends and romantic partners were consulted more frequently, and their support was perceived as more satisfying with increasing age. Teachers were contacted more frequently with increasing age, while satisfaction with their support remained stable. In contrast, though contacted less frequently, brothers and other relatives showed no changes in perceived satisfaction with support during adolescence. Parents and best friends were perceived as the most satisfying supporters during adolescence followed by romantic partners in later adolescence. Grandparents were perceived as an important support source but only in preadolescence. There were developmental differences during the various stages of adolescence with regard to the importance placed on each social support source. Both parents remained a very a satisfying support source, although they were consulted less often. Romantic partners and best friends gained importance as supporters in older adolescents, whereas grandparents represented a more important support source for preadolescents. Although teachers were not frequently consulted, they remained a stable and satisfying source of support.

**Keywords:** adolescence, longitudinal study, social support, social development, childhood

## INTRODUCTION

Previous research has shown that social support, especially in adolescence, has a major impact on psychological outcomes such as coping, general well-being, or behavioral problems (Raja et al., 1992; Kashani et al., 1994; Garnefski and Diekstra, 1996; Cook et al., 2002; Malecki and Demaray, 2002; Cohen, 2004; Levitt et al., 2007; Piko and Hamvai, 2010; Baqutayan, 2011; Rueger et al., 2016). Since the transition to adolescence is a psychologically vulnerable period and there is an association between social support and psychological problems, it is important to understand the development of social support and the social network during this developmental period, both in the familial and the non-familial domain.

During early childhood, parents are the most important source of social support. As children grow older other individuals may also potentially provide social support (e.g., teachers, friends or other relatives), but there is also evidence that the frequency of supportive interactions with adults decreases as the age of the adolescent increases (Montemayor and van Komen, 1980). Parents and their children report more conflict during adolescence and less physical affection, as well as spending less time with each other. Children develop a need for autonomy in order to develop their own identity (Buhrmester and Furman, 1987; Larson et al., 1996).

There is a marked change in social relationships with adolescents receiving and seeking less social support from their parents and more support from other sources. Research findings suggest a decline in the frequency and satisfaction with parental social support over the course of adolescence (Helsen et al., 2000; Demaray and Malecki, 2002; Cheng and Chan, 2004; Hombrados-Mendieta et al., 2012). However, several studies have also shown that even if adolescents seek assistance from their parents less often, they still continue to play an important role in their close social network as effective supporters (Furman and Buhrmester, 1992; Levitt, 2005; Nickerson and Nagle, 2005; Markiewicz et al., 2006; Levitt et al., 2007; Rueger et al., 2016). Furthermore, Furman and Buhrmester (1992) suggested, that the decline in frequency stops during late adolescence or early adulthood.

Previous research has also demonstrated controversial results regarding sex differences in perceived parental support. Some researchers did not find any differences at all (Helsen et al., 2000; Malecki and Demaray, 2003; Nickerson and Nagle, 2005; Bokhorst et al., 2010), whereas others have concluded that boys perceived support from their fathers as more satisfying than girls (Noller and Callan, 1990; Furman and Buhrmester, 1992; Tatar, 1998; Colarossi and Eccles, 2003; Hombrados-Mendieta et al., 2012). Various studies suggest that parental support is mediated by the sex of both the adolescent and the parent (Frey and Röthlisberger, 1996; Colarossi and Eccles, 2003; Hombrados-Mendieta et al., 2012). Few studies have examined the course and importance of other familial support sources, like siblings, grandparents, and other relatives. Results regarding the support and relationship among siblings are ambiguous, and have suggested that siblings seem to be an important source of support but it is unclear how this changes over the course of adolescence

(Furman and Buhrmester, 1992; Frey and Röthlisberger, 1996). Some studies have found no change in the quality of support from mid-adolescence to late adolescence (Scholte et al., 2001; Branje et al., 2004; Guan and Fuligni, 2016). Furthermore, girls seem to perceive support from siblings as more satisfying than boys (Furman and Buhrmester, 1992).

Furman and Buhrmester (1985) also reported that grandparents provide support and affection but as they are generally not around on a daily basis, it is understandable that the frequency of their interactions with the adolescent is lower than the respective frequency of interactions of parents or teachers. Perceived support by grandparents also tends to decrease with age in both female and male adolescents (Furman and Buhrmester, 1985, 1992). This finding was supported by Frey and Röthlisberger (1996), who found grandparents and other relatives to be more important as a source of support in preadolescents than in older adolescents.

With the expansion of the entire supportive network, peer groups become the center of attention (Manning and Allen, 1987; Crosnoe, 2000; Sturdevant and Spear, 2002; McGue et al., 2005; Rubin et al., 2006) and a more frequent source of support (Furman and Buhrmester, 1992). Mostly, studies show an increase in perceived support by friends from middle childhood to adolescence (Hunter and Youniss, 1982; Furman and Buhrmester, 1992; Helsen et al., 2000; Cheng and Chan, 2004; Hombrados-Mendieta et al., 2012) and peer support may exceed parental support (Hombrados-Mendieta et al., 2012). However, when including a measurement of support quality into the study, parents remain very important figures and are perceived as equally supportive as friends (Helsen et al., 2000; Bokhorst et al., 2010; McGrath et al., 2014). In terms of gender differences, girls tend to receive more satisfying support from friends than boys (Furman and Buhrmester, 1992; Frey and Röthlisberger, 1996; Demaray and Malecki, 2002; Colarossi and Eccles, 2003; Cheng and Chan, 2004). Helsen et al. (2000) found that in girls the support of friends exceeded parental support at the age of 15 to 17, whereas parents remained the most important support sources in boys. Romantic relationships may influence the course of seeking support from peers or relatives and are regarded as more supportive by older adolescents, with males tending to rate their relationships with romantic partners as more supportive than females (Furman and Buhrmester, 1992).

Teachers are also well-studied providers of social support. Younger children may especially benefit from supportive teachers if they are not receiving adequate support within the close family (Wang et al., 2013). However, if teacher support is compared to other support sources, it is perceived as less important than support from parents or friends (Furman and Buhrmester, 1992; Bokhorst et al., 2010; Hombrados-Mendieta et al., 2012). Studies mostly show a decrease in perceived teacher support during adolescence (Furman and Buhrmester, 1992; Malecki and Demaray, 2002; Bokhorst et al., 2010; Martínez et al., 2011). The reason for this decrease might be due to the change in school environments whereby most pupils have multiple teachers in higher educational year groups, and therefore the likelihood of forming more personal ties may be reduced (Galbo, 1984; Eccles et al., 1993). Girls report receiving more support

from teachers than boys do (Rueger et al., 2010; Martínez et al., 2011), but this effect might be limited to preadolescents (Furman and Buhrmester, 1992).

The studies summarized above have mostly examined the developmental changes in perceived social support by examining only a few selected specific support sources (e.g., parents, peers, and/or teachers) in cross-sectional settings. In these studies, the operationalization of the construct of social support varies across studies and depends on the focus of the research. Some studies have used general measures (Helsen et al., 2000; Branje et al., 2004; Bokhorst et al., 2010; Guan and Fuligni, 2016), whereas others have also included measures of perceived adequacy or efficiency of social support, or satisfaction with social support as a measurement of the quality of social support (Furman and Buhrmester, 1992; Frey and Röthlisberger, 1996; Garnefski and Diekstra, 1996; Demaray and Malecki, 2002; Martínez et al., 2011; Hombrados-Mendieta et al., 2012). To our knowledge, only two studies have used a longitudinal approach with one study only focusing on siblings (Branje et al., 2004) and the other starting only in late adolescence (Guan and Fuligni, 2016). Furthermore, both longitudinal studies addressed a general measurement of support rather than differentiating between contact frequency and satisfaction with support. Thus, the aim of the present study was to provide a comprehensive longitudinal assessment and analysis of the development of both perceived consultation frequency of and satisfaction with familial and non-familial support sources. The sources of support included mothers, fathers, brothers, sisters, grandparents, other relatives, best friends, romantic partners, and teachers during the period from preadolescence to late adolescence at three measurement time points.

This study aims to test the following hypotheses: (1) That the perceived consultation frequency of support from both mothers and fathers will decrease, but the satisfaction will remain stable during adolescence. Girls will perceive support from mothers as more satisfying, while boys will perceive support by fathers as more satisfying, (2) the perceived consultation frequency of and satisfaction with support provided by siblings will remain stable across time. Girls will experience sibling support as more satisfying than boys, (3) the perceived consultation frequency of support from grandparents and other relatives will decrease over time. Sex differences are not expected in this domain, (4) the support from best friends will be perceived as increasingly more frequent and more satisfying during the course of adolescence. The satisfaction will be higher in girls than in boys. 5 The perceived support by romantic partners will increase with age both in terms of frequency and satisfaction. 6 The consultation frequency of and satisfaction with perceived teacher support will decrease during adolescence. Furthermore, girls will perceive this support source as more satisfying than boys.

## MATERIALS AND METHODS

### Design

The sample was based on an original cohort of preadolescents and adolescents of the longitudinal Zurich Adolescent Psychology

and Psychopathology Study (ZAPPS, see Steinhausen et al. (1997) for more information). The cohort was a stratified randomized school-based sample representing the twelve counties of the canton of Zurich. The study comprised of three assessment times in 1994, 1997, and 2001. At each stage of the study some participants dropped out from the sample and some were added due to school changes. With its major focus on both normal and abnormal psychological development in adolescence, the ZAPPS considered various relevant determinants and risk factors for either well-being or psychopathology of various kinds including the assessment of intra-familial and extra-familial support (see Steinhausen, 2006).

### Participants

Since the aim of the present study was the analysis of the developmental course of perceived social support characteristics from preadolescence to late adolescence, the sample only included students who were in their preadolescence at the first assessment. Thus, the age range at the first measurement was set at 11–12 years ( $M = 11.47$ ,  $SD = 0.5$ ). The overall sample size was  $N = 857$ , including cross-sectional assessment ( $N = 305$ ; 35.6%) and longitudinal (two or more) assessments ( $N = 552$ ; 64.4%) assessments. With  $N = 419$  (48.9%) males and  $N = 438$  (51.1%) females there was no significant sex difference in the sample. In the total sample, at time 2 the mean age was 14.57 ( $SD = 0.6$ ) and at time 3 it was 18.13 ( $SD = 0.68$ ), respectively. Sample sizes at the three measurements were the following:  $N = 416$  (males  $N = 208$ , 50%; females  $N = 208$ , 50%) at T1;  $N = 760$  (males  $N = 369$ , 48.6%; females  $N = 391$ , 51.4%) at T2, and  $N = 475$  (males  $N = 211$ , 44.4%; females  $N = 264$ , 55.6%) at T3,  $N = 512$  (59.7%),  $N = 785$  (91.6%) of the participants reported to have a sister ( $N = 515$ , 60.1%) or a brother ( $N = 505$ , 58.9%), respectively.  $N = 821$  (95.8%) had at least one living grandparent and  $N = 555$  (64.8%) had a romantic partner at some point during the assessment and were therefore included in the analysis. At the time of the inception of the study, a large majority of the participants, namely, 85.8% were indigenous Swiss and a small minority were first or second generation migrants. In terms of ethnicity, the latter were almost exclusively of European decent with a strong focus on Southern European countries.

### Ethics Statement

At the time of the first data collection 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 center (based at the University of Zurich) or in the Canton of Zurich, Switzerland, to give approval. The principal investigator of the original study (H-CS) assures that the involvement of the local school authorities, the informed consent of the parents of all participating pupils should be regarded as an equivalent to the approval of an ethical committee. Furthermore, all authors declare that the present and earlier studies were conducted in compliance with the APA Ethical Principles. 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.

## Materials

The present study was based on the Adolescent Social Support Questionnaire (ASSQ) that had been developed for the ZAPPS (Reitzle, Unpublished). The questionnaire describes six hypothetical situations in which social support, either emotional or instrumental, is required. The situations include sharing of feelings, seeking practical help or explanations, talking about personal successes, reporting secret confessions, and problems of sexual development. Examples include the following: “If you need help with your homework, which person would you ask for help?” or “If you have done something wrong and feel bad, whom would you turn to?” For each situation, the questionnaire asks whether nine close individuals (mother, father, sister, brother, grandparents, other relatives, girlfriend or boyfriend, best friend and teacher) are considered as potential supporters. The responding adolescent can choose more than one supporter in one situation. A total consultation frequency score is calculated for each considered supporter across the 6 situations. In addition, the satisfaction with support provided by each of these individuals is rated for each situation on a five-point Likert-scale ranging from 0 to 4. This measure displays the adolescent’s satisfaction with the support or help given by each of the multiple supporters. For the analyses, we used a mean satisfaction score of each supporting person across the 6 situations. Unpublished factor analyses across situations revealed two stable dimensions, namely consultation frequency of and satisfaction with social support with alpha coefficients ranging from 0.70 to 0.87 across the three times of assessment (Winkler Metzke et al., Unpublished).

## Statistical Analyses

Frequency results were analyzed by a generalized estimating equations model with Poisson distribution considering the specific structure of the count-data. *Post hoc* comparisons of

estimated marginal means were corrected for multiple testing using the Sidak method, which corrects for Familywise Error rate and is similar to the Bonferroni method but slightly less conservative. Satisfaction was analyzed with a multilevel model, namely, a covariance pattern model treating participants as random effects and sex and time as fixed effects. The dependent variable was the satisfaction with the support from each support source. *Post hoc* analyses of estimated marginal means were conducted to detect the structure of time or sex differences. Additional *post hoc* comparisons of estimated marginal means were conducted to detect differences between the supporters. All *post hoc* calculations were corrected for multiple testing using the Sidak method. These statistical models allow the use of unbalanced datasets and include participants with missing waves (Singer and Willett, 2003; Ntoumanis, 2014). The estimated individual time trends are based on available data for each participant adjusted by the information from other participants (Gibbons, 1993). Therefore, the data is not biased due to systematic deletions (Newman, 2014). All data analyses were performed using SPSS for Windows version 23 (IBM Corp, 2015).

## RESULTS

It should be kept in mind that the following findings represent social support as perceived by the adolescents rather than actual support provided by the various partners of the social network. Findings will be presented in terms of descriptive means and standard deviations of (1) consultation frequencies (**Table 1**) and (2) support satisfaction (**Table 3**). In addition, effect analyses will be presented for time, sex, and time by sex interactions including the estimated marginal means *post hoc* analyses (**Tables 2, 4**).

### Frequencies of Social Support

Adolescents showed significant time effects for all consultation frequencies of social support from familial supporters except

**TABLE 1** | Mean frequencies of support consultation by source and time.

	MO		FA		SI		BR		GP		OR		BF		RP		TE	
	M	SD																
<b>Total</b>																		
T1	5.19	0.06	4.23	0.08	1.42	0.09	1.53	0.09	1.71	0.09	1.04	0.07	3.55	0.01	1.66	0.13	1.24	0.07
T2	4.78	0.05	3.83	0.06	1.71	0.08	1.49	0.07	1.30	0.06	1.25	0.06	4.57	0.06	2.31	0.09	1.56	0.05
T3	4.50	0.07	3.67	0.08	1.8	0.10	1.62	0.09	0.86	0.06	0.88	0.06	4.70	0.07	3.31	0.14	1.90	0.06
<b>Boys</b>																		
T1	5.04	0.08	4.48	0.11	1.21	0.12	1.77	0.14	1.78	0.13	1.03	0.11	3.04	0.14	1.78	0.18	1.23	0.09
T2	4.62	0.07	4.17	0.08	1.49	0.10	1.57	0.11	1.36	0.09	1.18	0.06	4.04	0.10	2.16	0.13	1.64	0.07
T3	4.25	0.11	3.91	0.12	1.62	0.14	1.7	0.14	0.83	0.09	0.87	0.09	4.33	0.12	3.03	0.22	2.06	0.10
<b>Girls</b>																		
T1	5.35	0.07	4.00	0.11	1.68	0.14	1.31	0.12	1.64	0.12	1.05	0.01	4.16	0.12	1.55	0.18	1.25	0.09
T2	4.95	0.07	3.51	0.08	1.97	0.11	1.41	0.09	1.26	0.08	1.32	0.08	5.18	0.07	2.46	0.13	1.49	0.07
T3	4.77	0.09	3.45	0.10	2.00	0.14	1.54	0.12	0.90	0.08	0.89	0.06	5.1	0.08	3.62	0.18	1.75	0.09

MO = Mother, FA = Father, SI = Sister, BR = Brother, GP = Grandparents, OR = Other relative, BF = Best friend, RP = Romantic partner, TE = Teacher.

**TABLE 2** | Time, sex, and time by sex effects in perceived support consultation frequencies of various sources.

	Time				Sex				Time*Sex		
	Wald $\chi^2$	df	p	Post hoc tests	Wald $\chi^2$	df	p	Post hoc tests	Wald $\chi^2$	df	p
MO	69.38	2	>0.001	T1>T2 > T3	21.49	1	>0.001	T1,T2,T3 <sup>a</sup>	2.71	2	n.s.
FA	35.0	2	>0.001	T1>T2 = T3	27.96	1	>0.001	T1,T2,T3 <sup>b</sup>	2.38	2	n.s.
SI	11.59	2	0.003	T1 < T2 = T3	9.53	1	0.002	T1,T2 <sup>a</sup>	0.95	2	n.s.
BR	3.45	2	n.s.	-	1.75	1	n.s.	-	0.95	2	n.s.
GP	72.68	2	>0.001	T1>T2 > T3	0.09	1	n.s.	-	1.58	2	n.s.
OR	25.06	2	>0.001	T1 < T2 > T3	0.4	1	n.s.	-	0.58	2	n.s.
BF	86.21	2	>0.001	T1 < T2 = T3	97.6	1	>0.001	T1,T2,T3 <sup>a</sup>	2.42	2	n.s.
RP	75.73	2	>0.001	T1 < T2 < T3	0.61	1	n.s.	-	3.46	2	n.s.
TE	54.08	2	>0.001	T1 < T2 < T3	2.41	1	n.s.	-	2.44	2	n.s.

MO = Mother, FA = Father, SI = Sister, BR = Brother, GP = Grandparents, OR = Other relative, BF = Best friend, RP = Romantic partner, TE = Teacher, T1 = time 1, T2 = time 2, T3 = time 3.

<sup>a</sup>Girls showed higher scores. <sup>b</sup>Boys showed higher scores.

**TABLE 3** | Mean perceived satisfaction with support by source and time.

	MO		FA		SI		BR		GP		OR		BF		RP		TE	
	M	SD																
<b>Total</b>																		
T1	4.07	0.03	4.08	0.03	3.57	0.06	3.45	0.06	3.68	0.05	3.45	0.08	3.61	0.04	3.70	0.08	3.82	0.07
T2	3.75	0.03	3.77	0.03	3.28	0.05	3.31	0.05	3.34	0.05	3.28	0.05	3.65	0.03	3.56	0.05	3.7	0.04
T3	3.84	0.03	3.84	0.03	3.45	0.06	3.4	0.05	3.49	0.07	3.34	0.06	3.86	0.03	3.77	0.06	3.8	0.04
<b>Boys</b>																		
T1	4.02	0.04	4.11	0.04	3.45	0.09	3.4	0.09	3.64	0.08	3.49	0.11	3.49	0.05	3.56	0.11	3.72	0.10
T2	3.67	0.38	3.72	0.04	3.19	0.07	3.19	0.07	3.28	0.07	3.28	0.07	3.46	0.04	3.41	0.07	3.56	0.06
T3	3.73	0.47	3.78	0.05	3.4	0.09	3.34	0.09	3.51	0.11	3.31	0.08	3.70	0.04	3.69	0.01	3.72	0.06
<b>Girls</b>																		
T1	4.13	0.04	4.05	0.04	3.69	0.08	3.51	0.09	3.71	0.07	3.42	0.1	3.73	0.05	3.84	0.11	3.92	0.09
T2	3.82	0.04	3.81	0.04	3.38	0.06	3.44	0.07	3.40	0.07	3.28	0.06	3.85	0.03	3.72	0.07	3.84	0.06
T3	3.95	0.04	3.90	0.04	3.50	0.07	3.46	0.07	3.48	0.01	3.37	0.09	4.02	0.04	3.85	0.08	3.88	0.05

MO = Mother, FA = Father, SI = Sister, BR = Brother, GP = Grandparents, OR = Other relative, BF = Best friend, RP = Romantic partner, TE = Teacher.

brothers. Parents and grandparents were consulted less frequently with increasing age of the adolescents. However, for fathers these results were only significant from preadolescence to middle adolescence. Sisters were consulted more frequently until middle adolescence, but there were no differences until late adolescence. Other relatives were contacted most often in middle adolescence.

Sex differences were found in both parents and sisters. Same-sex parents were consulted more frequently at all three measurement points. Sisters were consulted more often by girls in pre- to middle adolescence. There was a trend showing that preadolescent boys tended to consult their brothers more

often than girls. However, this result was not significant. For all three non-familial supporters there was a time effect showing more frequent consultations with increasing age. Sex differences were only found for consultation frequencies provided by best friends, indicating that girls reported higher frequencies during adolescence. There was no significant time by sex interaction.

## Satisfaction With Social Support

There were significant time effects in perceived satisfaction of social support provided by both parents, sisters and grandparents. While the satisfaction declined for mothers and grand-parents

**TABLE 4** | Time, sex and time by sex effects in perceived support satisfaction of various sources.

	Time				Sex				Time*Sex		
	F	df	p	Post hoc tests	F	df	p	Post hoc tests	F	df	p
MO	48.37	2,546.16	<0.001	T1 > T2 = T3; T1 > T3	16.80	1,674.71	<0.001	T1,T2,T3 <sup>a</sup>	1.08	2,546.16	n.s.
FA	34.96	2,545.05	<0.001	T1 > T2 < T3; T1 > T3	1.98	1,646.67	n.s.	-	2.84	2,545.05	n.s.
SI	8.54	2,274.51	<0.001	T1 > T2 < T3; T1 = T3	6.09	1,333.83	0.01	T2 <sup>a</sup>	0.49	2,274.51	n.s.
BR	2.26	2,243.01	n.s.	-	4.5	1,334.48	0.035	T2 <sup>a</sup>	0.78	2,243	n.s.
GP	11.69	2,292.45	<0.001	T1 > T2 = T3	0.47	1,355.93	n.s.	-	0.46	2,292.37	n.s.
OR	2.06	2,308.18	n.s.	-	0.000	1,362.93	n.s.	-	0.22	2,308.18	n.s.
BF	28.57	2,570.83	<0.001	T1 = T2 < T3; T1 < T3	67.53	1,655.07	<0.001	T1,T2,T3 <sup>a</sup>	1.62	2,570.83	n.s.
RP	3.9	2,273.97	0.02	T1 = T2 < T3; T1 < T3	10.09	1,337.29	0.002	T2 <sup>a</sup>	0.47	2,273.95	n.s.
TE	1.96	2,457.47	n.s.	-	11.42	1,453.58	0.001	T2,T3 <sup>a</sup>	0.51	2,457.47	n.s.

MO = Mother, FA = Father, SI = Sister, BR = Brother, GP = Grandparents, OR = Other relative, BF = Best friend, RP = Romantic partner, TE = Teacher, T1 = time 1, T2 = time 2, T3 = time 3.

<sup>a</sup>Girls had significantly higher scores.

until mid-adolescence, it increased for fathers and sisters again from middle to late adolescence.

Significant sex differences were found in the satisfaction provided by mothers and both siblings. Support from mothers was perceived as more satisfying by girls at all measurement times. Girls also perceived support from both siblings as more satisfying in middle adolescence than boys.

Furthermore, there were increased efficiencies provided by best friends and romantic partners from mid-adolescence to late adolescence. Girls rated best friends to be more satisfying supporters at all stages of adolescence, while they rated romantic partners as more satisfying than boys only in mid-adolescence. Girls also perceived support satisfaction of teachers as more satisfying than boys in mid- and late adolescence.

## Ranking and Comparison of Different Supporters

To display the ranking of the different supporters during pre-, mid- and late adolescence, we analyzed the differences between the nine support sources and calculated a rank order (see Tables 5, 6, for detailed information see Supplementary Tables 1, 2). The respective means and standard deviations are presented in Tables 1, 3. In the following, the findings will be presented for the three main stages of adolescence.

### Preadolescence

Preadolescents sought most support from mothers ( $M = 5.19$ ,  $SD = 0.06$ ,  $95\%CI = 5.09-5.30$ ) followed by fathers ( $M = 4.23$ ,  $SD = 0.08$ ,  $95\%CI = 4.08-4.39$ ) and best friends ( $M = 3.55$ ,

$SD = 0.01$ ,  $95\%CI = 3.37-3.75$ ). All three main support sources differed significantly from each other (all  $p < 0.001$ ) as well as the other remaining supporters). Grandparents, romantic partners and siblings ( $M = 1.71 - 1.42$ ) were not seen as the most important support sources but were still favored over teachers or other relatives ( $M = 1.04-1.24$ ).

Like the overall rankings, mothers, fathers and best friends were the most frequently chosen supporters by both girls and boys. However, preadolescent girls did not show a significant difference in their perception of support provided by best friends ( $M = 4.16$ ,  $SD = 0.12$ ,  $95\%CI = 3.93-4.41$ ) and fathers ( $M = 4.00$ ,  $SD = 0.11$ ,  $95\%CI = 3.79-4.23$ ). The

**TABLE 5** | Supporter ranks of support consultation frequencies.

	T1			T2			T3		
	All	Boys	Girls	All	Boys	Girls	All	Boys	Girls
1	MO	MO	MO	MO	MO	BF	BF	BF	BF
2	FA	FA	BF	BF	FA	MO	MO	MO	MO
3	BF	BF	FA	FA	BF	FA	FA	FA	RP
4	GP	RP, GP	SI	RP	RP	RP	RP	RP	FA
5	RP	BR	GP	SI	TE	SI	TE	TE	SI
6	BR	TE	RP	TE	BR	TE	SI	BR	TE
7	SI	SI	BR	BR	SI	BR	BR	SI	BR
8	TE	OR	TE	GP	GP	OR	OR	OR	GP
9	OR		OR	OR	OR	GP	GP	GP	OR

MO = Mother, FA = Father, SI = Sister, BR = Brother, GP = Grandparents, OR = Other relative, BF = Best friend, RP = Romantic partner, TE = Teacher, T1 = time 1, T2 = time 2, T3 = time 3.

**TABLE 6** | Supporter ranks of satisfaction with support.

	T1			T2			T3		
	All	Boys	Girls	All	Boys	Girls	All	Boys	Girls
1	FA	FA	MO	FA	FA	BF	BF	FA	BF
2	MO	MO	FA	MO	MO	TE	FA, MO	MO	MO
3	TE	TE	TE	TE	TE	MO, FA	TE	TE	FA
4	RP	GP	RP	BF	BF	RP	RP	BF	TE
5	GP	RP	BF	RP	RP	BR	GP	RP	RP
6	BF	OR, BF	GP	GP	OR, GP	GP	SI	GP	SI
7	SI	SI	SI	BR	BR, SI	SI	BR	SI	GP
8	BR, OR	BR	BR	OR, SI		OR	OR	BR	BR
9			OR					OR	OR

MO = Mother, FA = Father, SI = Sister, BR = Brother, GP = Grandparents, OR = Other relative, BF = Best friend, RP = Romantic partner, TE = Teacher, T1 = time 1, T2 = time 2, T3 = time 3.

support provided by other supporters also differed significantly from support provided by these three main support sources (all  $p < 0.001$ ).

Regarding satisfaction, parents were the most satisfying support sources (mother:  $M = 4.07$ ,  $SD = 0.03$ ,  $95\%CI = 3.99-4.15$ , father:  $M = 4.08$ ,  $SD = 0.03$ ,  $95\%CI = 3.99-4.15$ ). Teachers ( $M = 3.82$ ,  $SD = 0.07$ ,  $95\%CI = 3.70-3.90$ ), romantic partners ( $M = 3.7$ ,  $SD = 0.08$ ,  $95\%CI = 3.57-3.82$ ) and grandparents ( $M = 3.68$ ,  $SD = 0.05$ ,  $95\%CI = 3.57-3.75$ ) received significantly lower ratings than both parents (all  $p < 0.001$ ). Best friends ( $M = 3.61$ ,  $SD = 0.04$ ,  $95\%CI = 3.51-3.67$ ), siblings (brother:  $M = 3.45$ ,  $SD = 0.06$ ,  $95\%CI = 3.34-3.55$ ; sister:  $M = 3.57$ ,  $SD = 0.06$ ,  $95\%CI = 3.47-3.69$ ) and other relatives ( $M = 3.45$ ,  $SD = 0.08$ ,  $95\%CI = 3.31-3.53$ ) were regarded as the least satisfying supporters. Girls and boys both perceived best friends, grandparents, siblings and other relatives as significantly less satisfying than both parents (all  $p < 0.05$ ).

### Mid-adolescence

During mid-adolescence mothers ( $M = 4.78$ ,  $SD = 0.05$ ,  $95\%CI = 4.68-4.88$ ) and best friends ( $M = 4.57$ ,  $SD = 0.06$ ,  $95\%CI = 4.45-4.70$ ) were the most consulted source of support; the perception of their support did not differ significantly from each other. The next most frequently favored supporters were fathers ( $M = 3.83$ ,  $SD = 0.06$ ,  $95\%CI = 3.72-3.94$ ) and romantic partners ( $M = 2.31$ ,  $SD = 0.09$ ,  $95\%CI = 2.13-2.50$ ). Both ratings differed significantly from those regarding the other support sources (all  $p < 0.001$ ). The ratings on the other support sources ( $M = 1.71 - 1.25$ ,  $SD = 0.05-0.08$ ) showed overlapping results, so they cannot be differentiated completely from each other (see **Supplementary Table 1** for further information).

Girls rated best friends ( $M = 5.18$ ,  $SD = 0.07$ ,  $95\%CI = 5.06-5.31$ ) or their mothers ( $M = 4.95$ ,  $SD = 0.07$ ,  $95\%CI = 4.82-5.08$ ) equally in terms of their support source, while boys ranked both parents first (Mother:  $M = 4.62$ ,  $SD = 0.07$ ,  $95\%CI = 4.48-4.77$ , Father:  $M = 4.17$ ,  $SD = 0.08$ ,  $95\%CI = 4.02-4.33$ ). Both sexes gave significantly lower ranks to romantic partners than to the

three most important sources, both parents and best friends (all  $p < 0.001$ ), and significantly higher ranks than to the other remaining support sources (all  $p < 0.001$ ).

The adolescent satisfaction ratings regarding fathers ( $M = 3.77$ ,  $SD = 0.03$ ,  $95\%CI = 3.72-3.84$ ) in mid-adolescence did not differ significantly from mothers ( $M = 3.75$ ,  $SD = 0.03$ ,  $95\%CI = 3.69-3.81$ ), teachers ( $M = 3.7$ ,  $SD = 0.04$ ,  $95\%CI = 3.63-3.76$ ) or best friends ( $M = 3.65$ ,  $SD = 0.03$ ,  $95\%CI = 3.61-3.73$ ). Romantic partners ( $M = 3.56$ ,  $SD = 0.05$ ,  $95\%CI = 3.49-3.64$ ) were perceived as significantly less satisfying than fathers ( $p < 0.001$ ) but not than mothers, teachers or best friends. Grandparents ( $M = 3.34$ ,  $SD = 0.05$ ,  $95\%CI = 3.26-3.41$ ), both siblings (brother:  $M = 3.31$ ,  $SD = 0.05$ ,  $95\%CI = 3.24-3.40$ ; sister:  $M = 3.28$ ,  $SD = 0.05$ ,  $95\%CI = 3.22-3.38$ ) and other relatives ( $M = 3.28$ ,  $SD = 0.05$ ,  $95\%CI = 3.19-3.34$ ) were perceived as significantly less satisfying than all the other supporters. While girls in mid-adolescence showed a clear differentiation between two large groups, boys showed a more complex pattern of results with no clear discrimination between the supporters (see **Supplementary Table 2**). Girls perceived best friends ( $M = 3.85$ ,  $SD = 0.03$ ,  $95\%CI = 3.78-3.93$ ), teachers ( $M = 3.84$ ,  $SD = 0.06$ ,  $95\%CI = 3.73-3.89$ ), mothers ( $M = 3.82$ ,  $SD = 0.04$ ,  $95\%CI = 3.77-3.92$ ), fathers ( $M = 3.81$ ,  $SD = 0.04$ ,  $95\%CI = 3.75-3.91$ ) and romantic partners ( $M = 3.72$ ,  $SD = 0.07$ ,  $95\%CI = 3.61-3.81$ ) as significantly more satisfying than siblings (Brother:  $M = 3.44$ ,  $SD = 0.07$ ,  $95\%CI = 3.30-3.50$ ; Sister:  $M = 3.38$ ,  $SD = 0.06$ ,  $95\%CI = 3.30-3.52$ ), grandparents ( $M = 3.4$ ,  $SD = 0.07$ ,  $95\%CI = 3.28-3.48$ ), and other relatives ( $M = 3.28$ ,  $SD = 0.06$ ,  $95\%CI = 3.17-3.36$ ).

### Late Adolescence

Like in mid-adolescence, participants in late adolescence would consult their best friends ( $M = 4.70$ ,  $SD = 0.07$ ,  $95\%CI = 4.56-4.85$ ) and mothers most frequently ( $M = 4.5$ ,  $SD = 0.07$ ,  $95\%CI = 4.36-4.65$ ), followed by fathers ( $M = 3.67$ ,  $SD = 0.08$ ,  $95\%CI = 3.52-3.83$ ) and romantic partners ( $M = 3.31$ ,  $SD = 0.14$ ,  $95\%CI = 3.04-3.61$ ). The least considered support sources in late adolescence were other relatives ( $M = 0.89$ ,  $SD = 0.06$ ,  $95\%CI = 0.77-1.02$ ) and grandparents ( $M = 0.86$ ,  $SD = 0.06$ ,  $95\%CI = 0.76-1.00$ ). Girls and boys showed the same pattern of results as the total sample, except boys did not show any significant differences in ratings between parents and best friends.

Regarding the perceived satisfaction, the nine supporters can be collapsed into two groups. Best friends ( $M = 3.86$ ,  $SD = 0.03$ ,  $95\%CI = 3.79-3.93$ ), fathers ( $M = 3.84$ ,  $SD = 0.03$ ,  $95\%CI = 3.78-3.93$ ), mothers ( $M = 3.84$ ,  $SD = 0.03$ ,  $95\%CI = 3.78-3.93$ ), teachers ( $M = 3.8$ ,  $SD = 0.04$ ,  $95\%CI = 3.71-3.86$ ) and romantic partners ( $M = 3.77$ ,  $SD = 0.06$ ,  $95\%CI = 3.65-3.85$ ) were perceived as the most satisfying support sources in late adolescence. They did not differ significantly from each other but they all were perceived as significantly more satisfying supporters than the second group consisting of grandparents ( $M = 3.49$ ,  $SD = 0.07$ ,  $95\%CI = 3.35-3.56$ ), siblings (brother:  $M = 3.4$ ,  $SD = 0.05$ ,  $95\%CI = 3.30-3.49$ ; sister:  $M = 3.45$ ,  $SD = 0.06$ ,  $95\%CI = 3.34-3.54$ ) and other relatives ( $M = 3.34$ ,  $SD = 0.06$ ,  $95\%CI = 3.21-3.42$ ). Whilst girls showed the exact same pattern, boys also

perceived grandparents ( $M = 3.51$ ,  $SD = 0.11$ ,  $95\%CI = 3.29-3.55$ ) as highly satisfying supporters.

## DISCUSSION

The present study addressed the development of perceived social support from preadolescence to late adolescence. The proneness to consult major support providers was assessed in terms of consultation frequency of and satisfaction with the provided support. Based on a large community-based sample and a longitudinal design and using an innovative assessment tool, nine major support sources were evaluated by the adolescents across time. The emphasis was on adolescent perception of social support as this is an important driver during development, including both normal and deviating processes (McGrath et al., 2014). The hypothetical situations described in the questionnaire were considered as stimuli eliciting questionnaire responses reflecting support patterns existing in every-day life. The questionnaire was designed as an economic and valuable tool for the assessment of social support characteristics within a model of various determinants and risk-factors of both psychological well-being and psychopathology during various stages of adolescence.

With a strong focus on perceived social support and the longitudinal design, the present study shares to some extent the approach used by Guan and Fuligni (2016) and Branje et al. (2004), but differs in terms of the variety of social support sources and age span from the study by Branje et al. (2004). In contrast, the studies by Hombrados-Mendieta et al. (2012) and Furman and Buhrmester (1992) were limited by their cross-sectional design. A further strength of the present study is the dual focus on both consultation frequency and satisfaction with the social support during adolescence. To our knowledge, this is the first study to use such an approach. The major findings of the present study will be discussed in relation to the six hypotheses as outlined above.

First, as expected by the first hypothesis based on preceding cross-sectional studies (Helsen et al., 2000; Demaray and Malecki, 2002; Nickerson and Nagle, 2005; Hombrados-Mendieta et al., 2012), our longitudinal findings showed that young adolescents consulted their parents less often with increasing age. However, these contacts were still regarded as highly satisfying and the perceived satisfaction of contacts with fathers even increased from mid-adolescence to late adolescence. Both girls and boys preferred to consult their same-sex parent as indicated consistently by preceding studies (Furman and Buhrmester, 1992; Colarossi and Eccles, 2003).

Secondly, the development of perceived support by brothers and sisters was less consistent as expected by the second hypothesis. Rather than showing stable findings across time for both sexes there was an increase in consultation frequency of sisters but not of brothers across time. Whilst preadolescence girls sought more support from their sisters and boys from their brothers, this pattern was no longer evident by late adolescence. Furthermore, the perceived satisfaction of contacts with brothers remained stable, while sisters' support satisfaction

showed a decrease in mid-adolescence that was followed by an increase to the same level as in preadolescence. The support of both siblings were perceived as more satisfying by girls, which is in line with the second hypothesis as well as with the findings by Furman and Buhrmester (1992). The assumption based on the findings of the study by Scholte et al. (2001), that perceived support frequency and satisfaction of siblings would remain stable, was only true for brothers in the present study. Our results for perceived support provided by sisters differed from the preceding studies. This discrepancy might be due to methodological differences, such as previous studies merging both sisters and brothers into one combined group or different age spans (Scholte et al., 2001; van der Giessen et al., 2014; Guan and Fuligni, 2016). Clearly, more detailed research is warranted.

Thirdly, older adolescents sought less support from their grandparents, and as predicted by the third hypothesis based on the existing literature (Furman and Buhrmester, 1985, 1992), the grandparents were asked for help more often during preadolescence. This finding might be due to grandparents and grandchildren being close during the earlier phases of childhood, however, physical distance may increase over the course of adolescence. In parallel, the satisfaction with social support provided by grandparents also decreased up until mid-adolescence. The perceived consultation frequency of other relatives showed a peak in middle adolescence on a rather low level, whilst the perceived satisfaction remained stable. An explanation for this finding might also be the fact that the physical distance between adolescents and other relatives may increase throughout the later stages of adolescents. In line with the third hypothesis, there were no sex differences in either perceived consultation frequency or satisfaction.

Fourthly, and clearly in line with preceding studies (Furman and Buhrmester, 1992; Helsen et al., 2000; Hombrados-Mendieta et al., 2012), adolescents perceived the support by their best friends as more frequent and more satisfying with increasing age. This was particularly true for girls who during the whole period of adolescence perceived the support frequency and satisfaction as more pronounced than boys. This finding very much reflects the important general role played by best friends and peers during adolescence (Furman and Buhrmester, 1992; Helsen et al., 2000; Demaray and Malecki, 2002; Hombrados-Mendieta et al., 2012).

Fifthly, and again in accordance with preceding studies (Furman and Buhrmester, 1992), the present study corroborated the finding that perceived support by romantic partners increased in frequency and satisfaction, although the latter only increased with advanced age. Clearly, this time trend is based on first dating and romantic experiences that typically arise in mid-adolescence and increase in late adolescence and become the major focus of social relationships (Sullivan and Perry, 1953; Furman and Buhrmester, 1992).

Lastly, the perceived consultation frequency of teachers showed a similar pattern to what was observed with best friends and romantic partners. Our sixth hypothesis in contrast with preceding studies (Furman and Buhrmester, 1992; Bokhorst et al., 2010; Hombrados-Mendieta et al., 2012) found that the frequency in which adolescents sought help

from their teachers increased with age, whilst the perceived satisfaction remained stable during adolescence. Overall teachers were not often used as a source of support, but they were regarded as a valid source of support in a limited context. The finding that perceived consultation frequency of teachers increased might be due to their daily presence and relevance in the academic context with increasing academic demands in for older adolescents. However, in line with our hypothesis, girls perceived support provided by teachers as more satisfying than boys, but only during mid- and late adolescence.

Additional analyses of differences in the ratings between the various supporters showed that mothers, fathers and best friends were usually the most contacted and satisfying support source during adolescence. Their support was regarded as more satisfying than the support provided by other supporters like siblings, other relatives, or grandparents. Romantic partners set themselves apart from these less consulted or satisfying supporters with increasing age of the adolescents. As addressed before, teachers were seen as more satisfying than siblings, grandparents, or other relatives even if they were not consulted very often. In total, during the developmental period of adolescence there was a remarkable shift in perceived social support with parents and friends remaining stable resources in terms of their support satisfaction, whereas the relevance of all other relatives including siblings declined. At the same time, romantic partners and teachers became increasingly relevant. These patterns reflect major developmental changes in the adolescent socialization process (Buhrmester and Furman, 1987; Hartup, 1989; Helsen et al., 2000).

In terms of limitations, the present study did not differentiate between different kinds of support such as emotional or instrumental support. However, a preceding factor analysis based on data of the ASSQ resulted in only a single factor (Winkler Metzke et al., Unpublished). Further studies might benefit from differentiating these different support types. Although the questionnaire covers a wide variety of support sources, peer groups may be underrepresented as adolescents receive support from multiple supporters of the same age span and not just a romantic partner or a best friend.

Additionally, as the data was collected from a study with a strong focus on developmental psychopathology of the individual adolescent, some useful information about family demographics or cultural background was missing. However, given the predominance of 86% participants of Swiss origin in the study and the fact that the vast majority of migrants in the country are of other European origin, there is not much room for an undetected major cultural bias in the findings.

Another important limitation is the fact that our sample might have overestimated the satisfaction of the support sources because there was no response request for dissatisfaction. An additional issue may also be the lacking analysis of poor correlations between consultation frequency and satisfaction with social support. For instance, although some adolescents may not consult with a parent frequently, this support might still be highly relevant to

them and vice versa whereby high consultation frequencies may not result in satisfactory support. Analyses of this kind would require an extension of the current response format of the ASSQ.

Finally, it should be acknowledged that the sample of the present study was collected in the mid 90ies and followed up until 2001. However, available studies do not indicate that major time trends affecting the type and relevance of social relationships in adolescents living in Western societies have taken place in the 21st century so far (Bokhorst et al., 2010; Hombrados-Mendieta et al., 2012). The major social supporters studied in the present contribution have remained the same, although the mode of social contact may have changed, with a large increase of internet-based communication devices and platforms.

In summary, the present study highlighted the longitudinal changes in adolescent perceived consultation frequency and support satisfaction based on the evaluation of nine major supporters. Thus, the study has provided a more comprehensive overview than that of previous studies, which have tended to focus only on a small number of supporters. In addition, the longitudinal design of the study eliminates potential cohort effects, and the statistical model used in the analyses tolerates missing data that are inevitable in longitudinal studies. Furthermore, the study introduced a new assessment tool for measuring social support in adolescence that may be of value and modified for use in future studies of various kinds.

## DATA AVAILABILITY STATEMENT

The datasets generated for this study are available on request to the corresponding author.

## ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent from the participants' legal guardian/next of kin was not required to participate in this study in accordance with the national legislation and the institutional requirements.

## AUTHOR CONTRIBUTIONS

CW conducted the assessments during the three timepoints. AS analyzed the data and wrote the first draft of the manuscript with input from all authors. H-CS was the principal investigator of the project and supervised and revised the manuscript.

## SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fpsyg.2020.486915/full#supplementary-material>

## REFERENCES

- Baqutayan, S. (2011). Stress and social support. *Ind. J. Psychol. Med.* 33, 29–34. doi: 10.4103/0253-7176.85392
- Bokhorst, C. L., Sumter, S. R., and Westenberg, P. M. (2010). Social support from parents, friends, classmates, and teachers in children and adolescents aged 9 to 18 Years, who is perceived as most supportive? *Soc. Dev.* 19, 417–426. doi: 10.1111/j.1467-9507.2009.00540.x
- Branje, S. J. T., van Lieshout, C. F. M., van Aken, M. A. G., and Haselager, G. J. T. (2004). Perceived support in sibling relationships and adolescent adjustment. *J. Child Psychol. Psychiatry Allied Dis.* 45, 1385–1396. doi: 10.1111/j.1469-7610.2004.00845.x
- Buhrmester, D., and Furman, W. (1987). The development of companionship and intimacy. *Child Dev.* 58:1101. doi: 10.2307/1130550
- Cheng, S.-T., and Chan, A. C. (2004). The multidimensional scale of perceived social support, dimensionality and age and gender differences in adolescents. *Personal. Individ. Diff.* 37, 1359–1369. doi: 10.1016/j.paid.2004.01.006
- Cohen, S. (2004). Social relationships and health. *Am. Psychol.* 59, 676–684.
- Colarossi, L. G., and Eccles, J. S. (2003). Differential effects of support providers on adolescents' mental health. *Soc. Work Res.* 27, 19–30. doi: 10.1093/swr/27.1.19
- Cook, T. D., Herman, M. R., Phillips, M., and Settersten, J. R. A. (2002). Some ways in which neighborhoods, nuclear families, friendship groups, and schools jointly affect changes in early adolescent development. *Child Dev.* 73, 1283–1309. doi: 10.1111/1467-8624.00472
- Crosnoe, R. (2000). Friendships in childhood and adolescence. *Soc. Psychol. Quart.* 63, 377–391.
- Demaray, M. K., and Malecki, C. K. (2002). The relationship between perceived social support and maladjustment for students at risk. *Psychol. Schs.* 39, 305–316. doi: 10.1002/pits.10018
- Eccles, J. S., Midgley, C., Wigfield, A., Miller Buchanan, C., Reuman, D., Flanagan, C., et al. (1993). Development during adolescence: the impact of stage-environment fit on young adolescents' experiences in schools and in families. *Am. Psychol.* 48, 90–101. doi: 10.1037/0003-066x.48.2.90
- Frey, C. U., and Röthlisberger, C. (1996). Social support in healthy adolescents. *J. Youth Adoles.* 25, 17–31. doi: 10.1007/BF01537378
- Furman, W., and Buhrmester, D. (1985). Children's perceptions of the personal relationships in their social networks. *Dev. Psychol.* 21, 1016–1024. doi: 10.1037/0012-1649.21.6.1016
- Furman, W., and Buhrmester, D. (1992). Age and sex differences in perceptions of networks of personal relationships. *Child Dev.* 63:103. doi: 10.2307/1130905
- Galbo, J. J. (1984). Adolescents' perceptions of significant adults: a review of the literature. *Adolescence* 19:951.
- Garnefski, N., and Diekstra, R. F. (1996). Perceived social support from family, school, and peers: relationship with emotional and behavioral problems among adolescents. *J. Am. Acad. Child Adolesc. Psychiatry* 35, 1657–1664. doi: 10.1097/00004583-199612000-00018
- Gibbons, R. D. (1993). Some conceptual and statistical issues in analysis of longitudinal psychiatric data. *Arch. Gen. Psychiatry* 50:739. doi: 10.1001/archpsyc.1993.01820210073009
- Guan, S.-S. A., and Fuligni, A. J. (2016). Changes in parent, sibling, and peer support during the transition to young adulthood. *J. Res. Adolesc.* 26, 286–299. doi: 10.1111/jora.12191
- Hartup, W. W. (1989). Social relationships and their developmental significance. *Am. Psychol. Assoc.* 44, 120–126. doi: 10.1037/0003-066x.44.2.120
- Helsen, M., Vollebergh, W., and Meeus, W. (2000). Social support from parents and friends and emotional problems in adolescence. *J. Youth Adoles.* 29, 319–335.
- Hombrados-Mendieta, M. I., Gomez-Jacinto, L., Dominguez-Fuentes, J. M., Garcia-Leiva, P., and Castro-Travé, M. (2012). Types of social support provided by parents, teachers, and classmates during adolescence. *J. Commun. Psychol.* 40, 645–664. doi: 10.1002/jcop.20523
- Hunter, F. T., and Youniss, J. (1982). Changes in functions of three relations during adolescence. *Dev. Psychol.* 18, 806–811. doi: 10.1037/0012-1649.18.6.806
- IBM Corp (2015). *Released. IBM SPSS Statistics for Windows, Version 23.0.* Armonk, NY: IBM Corp.
- Kashani, J. H., Canfield, L. A., Boroduin, C. M., Soltys, S. M., and Reid, J. C. (1994). Perceived family and social support: impact on children. *J. Am. Acad. Child Adolesc. Psychiatry* 33, 819–823.
- Larson, R. W., Richards, M. H., Moneta, G., Holmbeck, G., and Duckett, E. (1996). Changes in Adolescents' daily interactions with their families from ages 10 to 18, disengagement and transformation. *Dev. Psychol.* 32, 744–754. doi: 10.1037/0012-1649.32.4.744
- Levitt, M. J. (2005). Social relations in childhood and adolescence, the convoy model perspective. *Hum. Dev.* 48, 28–47. doi: 10.1159/000083214
- Levitt, M. J., Silver, M. E., and Santos, J. D. (2007). Adolescents in transition to adulthood: parental support, relationship satisfaction, and post-transition adjustment. *J. Adult Dev.* 14, 53–63. doi: 10.1007/s10804-007-9032-5
- Malecki, C. K., and Demaray, M. K. (2002). Measuring perceived social support: development of the child and adolescent social support scale (CASSS). *Psychol. Sch.* 39, 1–18.
- Malecki, C. K., and Demaray, M. K. (2003). What type of support do they need? Investigating student adjustment as related to emotional, informational, appraisal, and instrumental support. *Sch. Psychol. Quart.* 18, 231–252. doi: 10.1521/scpq.18.3.231.22576
- Manning, M. L., and Allen, M. G. (1987). Social development in early adolescence: implications for middle school educators. *Childh. Educ.* 63, 172–176. doi: 10.1080/00094056.1987.10520782
- Markiewicz, D., Lawford, H., Doyle, A. B., and Haggart, N. (2006). Developmental differences in Adolescents' and young adults' use of mothers, fathers, best friends, and romantic partners to fulfill attachment needs. *J. Youth Adoles.* 35, 121–134. doi: 10.1007/s10964-005-9014-5
- Martínez, R. S., Aricak, O. T., Graves, M. N., Peters-Myszak, J., and Nellis, L. (2011). Changes in perceived social support and socioemotional adjustment across the elementary to junior high school transition. *J. Youth Adoles.* 40, 519–530. doi: 10.1007/s10964-010-9572-z
- McGrath, B., Brennan, M. A., Dolan, P., and Barnett, R. (2014). Adolescents and their networks of social support. Real connections in real lives? *Child Fam. Soc. Work* 19, 237–248. doi: 10.1111/j.1365-2206.2012.00899.x
- McGue, M., Elkins, I., Walden, B., and Iacono, W. G. (2005). Perceptions of the parent-adolescent relationship: a longitudinal investigation. *Dev. Psychol.* 41, 971–984. doi: 10.1037/0012-1649.41.6.971
- Montemayor, R., and van Komen, R. (1980). Age segregation of adolescents in and out of school. *J. Youth Adoles.* 9, 371–381. doi: 10.1007/BF02087675
- Newman, D. A. (2014). Missing data. *Org. Res. Methods* 17, 372–411. doi: 10.1177/1094428114548590
- Nickerson, A. B., and Nagle, R. J. (2005). Parent and peer attachment in late childhood and early adolescence. *J. Early Adoles.* 25, 223–249. doi: 10.1177/0272431604274174
- Noller, P., and Callan, V. J. (1990). Adolescents' perceptions of the nature of their communication with parents. *J. Youth Adoles.* 19, 349–362. doi: 10.1007/BF01537077
- Ntoumanis, N. (2014). Analysing longitudinal data with multilevel modelling. *Eur. Health Psychol.* 12, 40–45.
- Piko, B. F., and Hamvai, C. (2010). Parent, school and peer-related correlates of adolescents' life satisfaction. *Child. Youth Serv. Rev.* 32, 1479–1482. doi: 10.1016/j.childyouth.2010.07.007
- Raja, S. N., McGee, R., and Stanton, W. R. (1992). Perceived attachments to parents and peers and psychological well-being in adolescence. *J. Youth Adoles.* 21, 471–485. doi: 10.1007/BF01537898
- Rubin, K. H., Wojslawowicz, J. C., Rose-Krasnor, L., Booth-LaForce, C., and Burgess, K. B. (2006). The best friendships of shy/withdrawn children: prevalence, stability, and relationship quality. *J. Abnorm. Child Psychol.* 34, 143–157. doi: 10.1007/s10802-005-9017-4
- Rueger, S. Y., Malecki, C. K., and Demaray, M. K. (2010). Relationship between multiple sources of perceived social support and psychological and academic adjustment in early adolescence: comparisons across gender. *J. Youth Adoles.* 39, 47–61. doi: 10.1007/s10964-008-9368-6
- Rueger, S. Y., Malecki, C. K., Pyun, Y., Aycocock, C., and Coyle, S. (2016). A meta-analytic review of the association between perceived social support and depression in childhood and adolescence. *Psychol. Bull.* 142, 1017–1067. doi: 10.1037/bul0000058
- Scholte, R., Lieshout, C., and Van Aken, M. (2001). Perceived Relational Support in Adolescence: Dimensions, Configurations, and Adolescent Adjustment. *J. Res. Adoles.* 11:71. doi: 10.1111/1532-7795.00004

- Singer, J. D., and Willett, J. B. (2003). *Applied Longitudinal Data Analysis: Modeling Change and Event Occurrence*. Oxford: Oxford Univ. Press.
- Steinhausen, H. -C. (2006). Developmental psychopathology in adolescence: findings from a Swiss study—the NAPE Lecture 2005. *Acta Psychiatr. Scand.* 113, 6–12. doi: 10.1111/j.1600-0447.2005.00706.x
- Steinhausen, H. -C., Metzke, C. W., Meier, M., and Kannenberg, R. (1997). Behavioral and emotional problems reported by parents for ages 6 to 17 in a Swiss epidemiological study. *Eur. Child Adoles. Psychiatry* 6, 136–141. doi: 10.1007/BF00538985
- Sturdevant, M. S., and Spear, B. (2002). Adolescent Psychosocial Development. *J. Am. Diet. Assoc.* 102, S30-S31. doi: 10.1016/S0002-8223(02)90419-0
- Sullivan, H. S., and Perry, H. S., eds (1953). *The interpersonal theory of psychiatry*. New York, NY: Norton.
- Tatar, M. (1998). Significant individuals in adolescence: adolescent and adult perspectives. *J. Adoles.* 21, 691–702. doi: 10.1006/jado.1998.0189
- van der Giessen, D., Branje, S., and Meeus, W. (2014). Perceived autonomy support from parents and best friends. longitudinal associations with adolescents' depressive symptoms. *Soc. Dev.* 23, 537–555. doi: 10.1111/sode.12061
- Wang, M. -T., Brinkworth, M., and Eccles, J. (2013). Moderating effects of teacher-student relationship in adolescent trajectories of emotional and behavioral adjustment. *Dev. Psychol.* 49, 690–705. doi: 10.1037/a0027916

**Conflict of Interest:** The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Copyright © 2020 Spitz, Winkler Metzke and Steinhausen. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

## Supplementary Tables

## Supplementary Table 1

## Comparison of Supporter Consultation Frequencies

	<i>T1</i>	<i>T2</i>	<i>T3</i>
All	MO>FA, BF, GP, RP, BR, SI, TE, OR FA>BF, GP, RP, BR, SI, TE, OR BF>GP, RP, BR, SI, TE, OR GP=RP=BR=SI RP>TE, OR BR>TE, OR SI=TE; SI>OR TE=OR	MO=BF MO, BF>FA, RP, SI, TE, BR, GP FA>RP, SI, TE, BR, GP RP>SI, TE, BR, GP SI=TE; SI>BR, GP TE=BR; TE>GP BR=GP; BR>OR GP=OR	BF=MO MO, BF>FA, RP, TE, SI, BR, OR, GP FA=RP; FA, RP>TE, SI, BR, OR, GP TE=SI; TE>BR, OR, GP SI=BR; SI, BR >OR, GP OR=GP
Boys	MO=FA MO, FA>BF, RP, GP, BR, TE, SI, OR BF>RP, GP, BR, TE, SI, OR GP=RP=BR ; RP, GP, BR<SI, TE, OR SI=TE=OR	MO=FA MO>BF, RP, TE, BR, SI, GP, OR FA=BF FA, BF=RP, TE, BR, SI, GP, OR RP > TE, BR, SI, GP, OR TE=BR, SI ; TE>GP, OR BR=SI=GP ; BR, SI >OR GP=OR	BF=MO=FA BF, MO, FA>RP, TE, BR, SI, OR, GP RP>TE, BR, SI, OR, GP TE=BR; TE > SI, OR, GP BR=SI OR=GP
Girls	MO>FA, BR, GP, SI, RP, BR, TE, OR FA=BF FA, BF>GP, SI, RP, BR, TE, OR GP=SI=RP=BR; GP, SI, RP>TE, OR BR=TE TE>OR	BF=MO BF, MO>FA, RP, SI, TE, BR, OR, GP FA>RP, SI, TE, BR, OR, GP RP > SI, TE, BR, OR, GP SI = TE, BR, OR, GP TE=BR=OR=GP	BF=MO BF, MO>RP, FA, SI, TE, BR, GP, OR RP=FA; RP, FA= SI, TE, BR, GP, OR SI=TE; SI > BR, GP, OR TE=BR; TE, BR=GP, OR GP=OR

*Note.* MO = Mother, FA = Father, SI = Sister, BR = Brother, GP = Grandparents, OR = Other relative, BF = Best friend, RP = Romantic partner, TE = Teacher, T1 = time 1, T2 = time 2, T3 = time 3, > and < indicate significant differences; = indicates non-significant differences

**Supplementary Table 2***Comparison of Supporter Satisfaction*

	<i>T1</i>	<i>T2</i>	<i>T3</i>
All	FA=MO FA, MO > TE, RP, GP, BF, SI, BR, OR TE > BF, BR, OR; TE = RP, GP RP = GP = BF = SI = BR = OR	MO, FA, TE, BF, RP > GR, BR, SI, OR MO = TE = BF = RP FA > RP GR = OR = BR = SI	FA = BF = MO = TE = RP GR = BR = SI = OR BF, FA, MO, TE, RP > GR, BR, SI, OR
Boys	FA=MO FA, MO=GP, RP, OR, BF, SI, BR MO=TE FA>TE TE=GP=RP=OR=BF=SI=BR FA=MO FA, MO=GP, RP, OR, BF, SI, BR	FA=MO=TE FA > BF, RP, OR, GP, BR, SI MO= RP = BF= TE TE, MO > OR, GP, BR, SI BF=OR, GP ; BF>BR, SI RP= OR, GP, BR, SI OR=GP=BR=S	FA = MO = TE = RP = BF = GP SI = BR = OR ; SI < MO, FA BR < MO, FA, BF, GP OR < MO, FA, RP, BF, GP GP = MO, FA, TE, RP, BF, SI
Girls	MO = FA = RP = TE MO, FA = BF, GP, SI, BR, OR TE=RP=BF=GP=SI ; TE>BR, OR RP>OR BF=GP=SI=BR=OR MO=FA=RP=TE MO, FA= BF, GP, SI, BR, OR	BF=TE=MO=FA=RP BF, TE, MO, FA, RP>GP, BR, SI, OR GP=BR=SI=OR	BF=MO=FA=RP=TE SI=GP=BR=OR BF, MO, FA, RP, TE = SI, GP, BR, OR

*Note.* MO = Mother, FA = Father, SI = Sister, BR = Brother, GP = Grandparents, OR = Other relative, BF = Best friend, RP = Romantic partner, TE = Teacher, T1 = time 1, T2 = time 2, T3 = time 3, > and < indicate significant differences; = indicates non-significant differences

## **Appendix B (Manuscript 2)**

**Growth trajectories of perceived parental behaviour during adolescence.**

Andrea Spitz, Christa Winkler Metzke, Hans-Christoph Steinhausen

Published in *Child Psychiatry and Human Development*

doi: 10.1007/s10578-020-01095-1

# **Growth trajectories of perceived parental behavior during adolescence**

Andrea Spitz<sup>1,2</sup>, Christa Winkler Metzke<sup>1</sup> and Hans-Christoph Steinhausen<sup>1,2,3,4</sup>

<sup>1</sup>Department of Child and Adolescent Psychiatry and Psychotherapy, Psychiatric University Hospital, Zurich, Switzerland

<sup>2</sup>Clinical Psychology and Epidemiology, Department of Psychology, University of Basel, Switzerland

<sup>3</sup>Department of Child and Adolescent Psychiatry, University of Southern Denmark, Odense, Denmark

<sup>4</sup>Centre for Child and Adolescent Mental Health, Capital Region Psychiatry, Copenhagen, Denmark

## **Author correspondence**

Andrea Spitz, MSc

Department of Child and Adolescent Psychiatry and Psychotherapy

University Hospital of Psychiatry

Neumünsterallee 9 P.O. Box 233

8032 Zurich

Email: [andrea.spitz@puk.zh.ch](mailto:andrea.spitz@puk.zh.ch)

Phone: +41 (0)43 499 26 26

Fax: +41 (0)43 499 26 02

**Running title:** Perceived parental behavior during adolescence

## **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 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 to 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 ( $p = .03$ ) 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 6 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 ( $r = .71 - .79$ ). 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 .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 [45] as summarized by Shek and Ma [46]. 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" [47]. All data analyses were based on raw scores and were performed using SPSS for Windows version 23 [48].

### **Results**

Missing data analysis showed that the values at T1 ( $\chi^2$  (2079, N = 320) = 2065.33,  $p = .58$ ) for both parents and regarding maternal behavior at T2 were missing completely at random ( $\chi^2$  (463, N = 545) = 501.48,  $p = .11$ ). 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 control at T2 ( $r = -.09$ ,  $p = .045$ ) and perceived parental psychological control at T3 (mothers:  $r = -.09$ ,  $p = .044$ , fathers:  $r = -.11$ ,  $p = .018$ ).

Repeated measures ANOVAs showed significant differences of maternal and paternal acceptance and control during all three assessment points. Generally, the scores of perceived maternal acceptance (Wilks' Lambda = .77,  $F(1,205) = 61.96$ ,  $p < .001$ ) and control (Wilks' Lambda = .72,  $F(1,205) = 81.07$ ,  $p < .001$ ) were higher than the respective scores of the fathers. Psychological control did not show any significant differences between mothers and fathers (Wilks' Lambda = .99,  $F(1,205) = 1.51$ ,  $p = .22$ ). 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:  $r = .25 - .75$ , psychological control:  $r = .25-.80$ , control:  $r = .30-.76$ ) at all three assessment points.

*Insert table 1 about here*

The intraclass coefficients (ICC) for perceived parental acceptance were .47 (mother) and .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 .37 (mother) and .38 (father), whereas they were .35 (mother) and .35 (father) for parental control. These values were well above .25 and, thus, the use of this model in the analysis was adequate [46]. 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.

*Insert table 2 and 3 about here*

### ***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 ( $\beta = 0.37$ ,  $SE = 0.16$ ,  $p = .025$ ), the same effect was not found for perceived paternal acceptance ( $\beta = -0.07$ ,  $SE = 0.20$ ,  $p = .70$ ). 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 figure 1). Including a time variable and sex as predictors did not increase the model fit coefficients significantly (maternal acceptance:  $\chi^2(2) = 5.73$ ,  $p = .06$ ;  $\Delta AIC = -1.73$ ;  $\Delta BIC = 11.64$ ; paternal acceptance  $\chi^2(2) = .03$ ,  $p = .99$ ;  $\Delta AIC = 3.97$ ;  $\Delta BIC = 14.23$ ).

*Insert figure 1 about here*

### ***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:  $\beta = -1.35$ ,  $SE = 0.14$ ,  $p < .001$ ; father:  $\beta = -1.22$ ,  $SE = 0.13$ ,  $p < .001$ ). 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 figure 2). The linear conditional model significantly improved the model fit over the unconditional model (maternal control:  $\chi^2(2) = 11.57$ ,  $p < .001$ ;  $\Delta AIC = 52.43$ ;  $\Delta BIC = 2.8$ ; paternal control  $\chi^2(2) = 9.33$ ,  $p = .01$ ;  $\Delta AIC = 5.33$ ;  $\Delta BIC = 4.92$ ).

*Insert figure 2 about here*

### ***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:  $\beta = -1.04$ ,  $SE = .12$ ,  $p < .001$ ; father:  $\beta = -1.32$ ,  $SE = .12$ ,  $p < .001$ ). The conditional model showed a significant main effect for sex for perceived maternal as well as paternal structure. There was also a significant time by sex interaction, but this interaction was only significant for paternal structure ( $p = .041$ ). 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 figure 3). There was a significant improvement of the model fit from the linear conditional model significantly over the unconditional model (maternal structure :  $\chi^2(2) = 6.65$ ,  $p = .04$ ;  $\Delta AIC = 2.65$ ;  $\Delta BIC = 7.75$ ; paternal structure :  $\chi^2(2) = 6.25$ ,  $p = .04$ ;  $\Delta AIC = 2.2$ ;  $\Delta BIC = 8.05$ ).

*Insert figure 3 about here*

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 complete 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 & 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 & 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 & 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 5<sup>th</sup> to 8<sup>th</sup> 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 & Burger [8], but in line with the findings by Paulson and Spunta [35], Keijsers and Poulin [34] and Keijsers et al. [33]. However, the samples of the cross-sectional study by Armentrout & 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 [49]. 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 & 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 [50] including substance use problems [51–53], depression [54], and suicidality [55, 56]. 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 [57, 58] 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.

## **Compliance with Ethical Standards**

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.

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.

### **Acknowledgement**

Our co-author Christa Winkler Metzke sadly died recently. We are grateful for the long-standing cooperation that we had with her throughout the many years when performing the present longitudinal project. This paper is devoted to her memory. The authors would also like to thank the reviewer of this paper for very constructive comments and suggestions.

## 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. doi: 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. doi: 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.
5. Siegelman M (1965) Evaluation of Bronfenbrenner's Questionnaire for Children concerning Parental Behavior. *Child Development* 36(1): 163. doi: 10.2307/1126788
6. Renson GJ, Schaefer ES, Levy BI (1968) Cross-National Validity of a Spherical Conceptual Model for Parent Behavior. *Child Development* 39(4): 1229. doi: 10.2307/1127287
7. Schaefer ES (1965) Children's Reports of Parental Behavior: An Inventory. *Child Development* 36(2): 413. doi: 10.2307/1126465
8. Armentrout JA, Burger GK (1972) Children's reports of parental child-rearing behavior at five grade levels. *Developmental Psychology* 7(1): 44–48. doi: 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. *Developmental Review* 30(1): 74–99. doi: 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 Development Perspectives* 3(3): 165–170. doi: 10.1111/j.1750-8606.2009.00099.x
11. Steinberg L (2001) We Know Some Things: Parent-Adolescent Relationships in Retrospect and Prospect. *J Research Adolescence* 11(1): 1–19. doi: 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. doi: 10.1023/A:1021800432380
13. Barber BK (1996) Parental Psychological Control: Revisiting a Neglected Construct. *Child Development* 67(6): 3296–3319. doi: 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. doi: 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. doi: 10.1016/j.adolescence.2005.08.003
  17. Perris C, Arrindell WA, Eisemann M (1994) Parenting and psychopathology. Wiley
  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. doi: 10.1080/15374416.2011.563470
  19. Kawash GF, Kerr EN, Clewes JL (1985) Self-Esteem in Children as a Function of Perceived Parental Behavior. *The Journal of Psychology* 119(3): 235–242. doi: 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. doi: 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. doi: 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. doi: 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 Develop.* 31: n/a-n/a. doi: 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. doi: 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. doi: 10.1017/S0033291700033717
  26. Wolfradt U, Hempel S, Miles JN (2003) Perceived parenting styles, depersonalisation, anxiety and coping behaviour in adolescents. *Personality and Individual Differences* 34(3): 521–532. doi: 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. doi: 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 Development and Care* 180(4): 535–556. doi: 10.1080/03004430802113042
  30. Gecas V, Schwalbe ML (1986) Parental Behavior and Adolescent Self-Esteem. *Journal of Marriage and the Family* 48(1): 37. doi: 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. *Journal of Family Psychology* 14(4): 531–555. doi: 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. *Developmental Psychology* 11(3): 391. doi: 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. *Developmental Psychology* 45(5): 1314–1327. doi: 10.1037/a0016693
34. Keijsers L, Poulin F (2013) Developmental changes in parent-child communication throughout adolescence. *Developmental Psychology* 49(12): 2301–2308. doi: 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. doi: 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. doi: 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. doi: 10.1007/BF00538985
39. Schludermann E, Schludermann S (2010) Replicability of Factors in Children's Report of Parent Behavior (CRPBI). *The Journal of Psychology* 76(2): 239–249. doi: 10.1080/00223980.1970.9916845
40. Reitzle M, Winkler Metzke C, Steinhausen H (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 Univ. Press, Oxford
42. Ntoumanis N (2014) Analysing longitudinal data with multilevel modelling. *The European Health Psychologist*(16): 40–45
43. Newman DA (2014) Missing Data. *Organizational Research Methods* 17(4): 372–411. doi: 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. Singer JD, Willett JB (2003) *Applied longitudinal data analysis: Modeling change and event occurrence*. Oxford Univ. Press, Oxford
46. Shek DTL, Ma CMS (2011) Longitudinal data analyses using linear mixed models in SPSS: concepts, procedures and illustrations. *ScientificWorldJournal* 11: 42–76. doi: 10.1100/tsw.2011.2
47. Little RJA (1988) A Test of Missing Completely at Random for Multivariate Data with Missing Values. *Journal of the American Statistical Association* 83(404): 1198. doi: 10.2307/2290157

48. IBM Corp Released 2015. IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp.
49. Lerner RM, Steinberg LD (eds) (2009) Handbook of adolescent psychology, 3. ed. Wiley Interscience, Hoboken, NJ
50. Steinhausen H-C, Metzke CW (2001) Risk, Compensatory, Vulnerability, and Protective Factors Influencing Mental Health in Adolescence. *Journal of Youth and Adolescence* 30(3): 259–280. doi: 10.1023/A:1010471210790
51. 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. doi: 10.1017/S0021963097002151
52. Steinhausen H-C, Metzke CW (2003) The validity of adolescent types of alcohol use. *J Child Psychol Psychiatry* 44(5): 677–686. doi: 10.1111/1469-7610.00154
53. Steinhausen H-C, Eschmann S, Metzke CW (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. doi: 10.1186/1753-2000-1-12
54. Steinhausen H-C, Metzke CW (2000) Adolescent Self-Rated Depressive Symptoms in a Swiss Epidemiological Study. *Journal of Youth and Adolescence* 29(4): 427–440. doi: 10.1023/A:1005106409022
55. Steinhausen H-C, Metzke CWW (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. doi: 10.1111/j.1600-0447.2004.00364.x
56. Steinhausen H-C, Bösiger R, Metzke CW (2006) Stability, correlates, and outcome of adolescent suicidal risk. *J Child Psychol Psychiatry* 47(7): 713–722. doi: 10.1111/j.1469-7610.2005.01569.x
57. 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. doi: 10.1037/a0013177
58. Gurland ST, Grolnick WS (2005) Perceived Threat, Controlling Parenting, and Children's Achievement Orientations. *Motiv Emot* 29(2): 103–121. doi: 10.1007/s11031-005-7956-2

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	<i>p</i>	95%CI	Coeff.	SE	<i>p</i>	95%CI	Coeff.	SE	<i>p</i>	95%CI
Intercept	25.15	1.22	<.001	22.75 27.55	10.35	.67	<.001	9.99 14.28	14.87	.84	<.001	13.21 16.52
Time	.07	.53	.90	-.97 1.11	-2.15	.45	<.001	-2.99 -1.20	-1.65	.37	<.001	-2.38 -.92
Sex	.58	.77	.45	-.93 2.08	-1.48	.43	.001	-3.31 -.63	-1.28	.52	.015	-2.31 -.25
Sex*Time	.19	.33	.57	-.46 .83	.51	.28	.073	-.06 1.05	.40	.23	.082	-.05 .57

Table 3 Fixed effects of IGC analysis with perceived paternal behavior

	Acceptance				Psychological Control				Structure			
	Coeff.	SE	<i>p</i>	95%CI	Coeff.	SE	<i>p</i>	95%CI	Coeff.	SE	<i>p</i>	95%CI
Intercept	24.93	1.37	<.001	22.24 27.64	11.49	1.02	<.001	9.48 13.50	14.27	.86	<.001	12.57 15.96
Time	-.18	.63	.77	-1.42 1.06	-2.03	.43	<.001	-2.87 -1.19	-2.06	.38	<.001	-2.81 -1.30
Sex	-.11	.86	.90	-1.80 1.58	-1.84	.64	.004	-3.10 -.58	-1.34	.54	.013	-2.40 -.28
Sex*Time	.07	.39	.86	-.71 .84	.54	.27	.044	.01 1.06	.41	.24	.041	.02 .95

*Note.*

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

Perceived parental behavior during adolescence

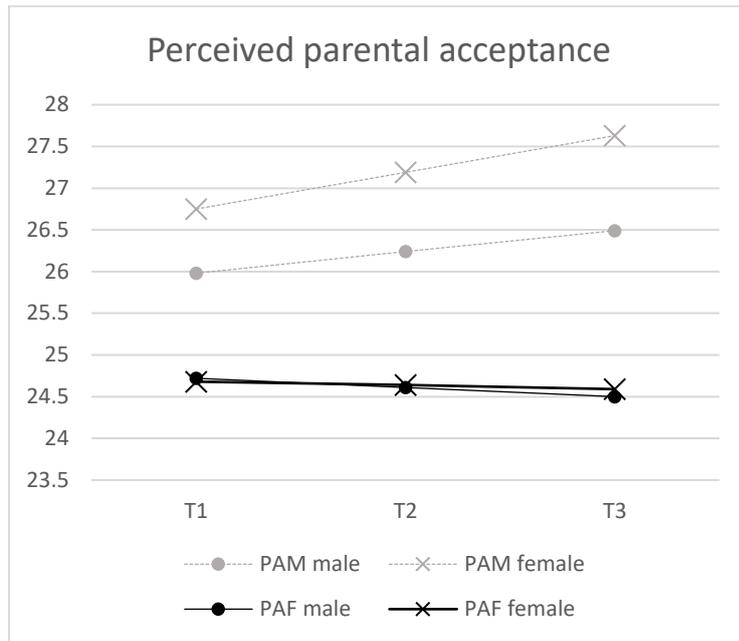


Figure 1. Predicted estimates of perceived parental acceptance

PAM= Perceived acceptance mother

PAF= Perceived acceptance father

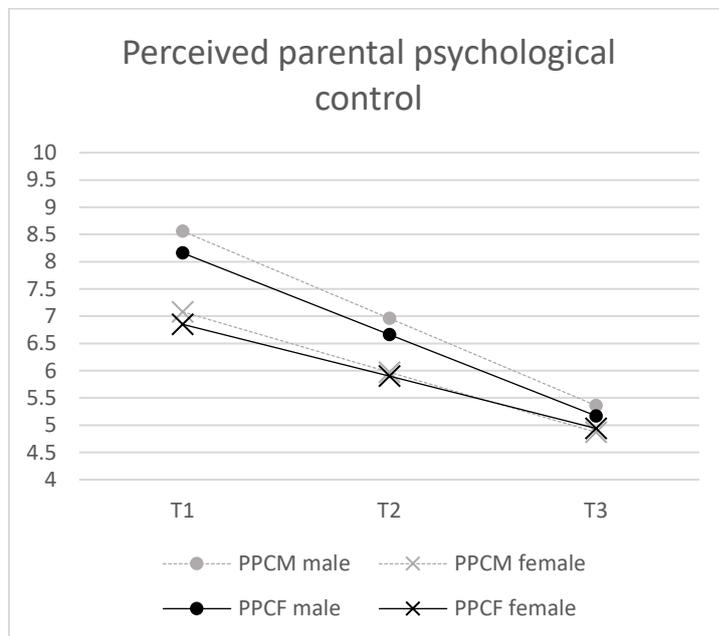


Figure 2. Predicted estimates of perceived parental psychological control

PPCM= Perceived psychological control mother

PPCF= Perceived psychological control father

Perceived parental behavior during adolescence

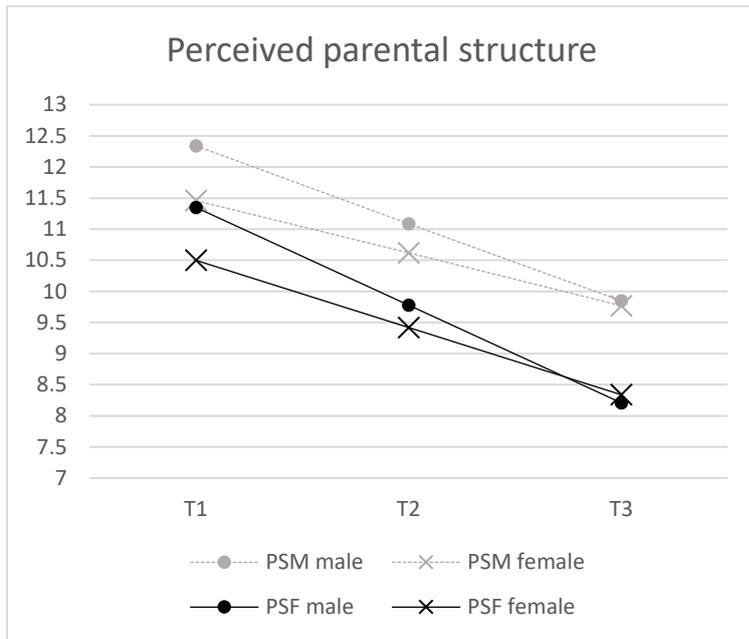


Figure 3. Predicted estimates of perceived parental structure

PSM= Perceived structure mother

PSF= Perceived structure father

**Appendix C (Manuscript 3)**

**Development of Family Adaptability and Cohesion from Adolescence to Young  
Adulthood and Associations with Parental Behaviour.**

Andrea Spitz and Hans-Christoph Steinhausen

(submitted for publication)

# **Development of Family Adaptability and Cohesion from Adolescence to Young Adulthood and Associations with Parental Behaviour**

Andrea Spitz<sup>1,2</sup> and Hans-Christoph Steinhausen<sup>1,2,3,4</sup>

<sup>1</sup>Department of Child and Adolescent Psychiatry and Psychotherapy, Psychiatric University Hospital, Zurich, Switzerland

<sup>2</sup>Clinical Psychology and Epidemiology, Department of Psychology, University of Basel, Switzerland

<sup>3</sup>Department of Child and Adolescent Psychiatry, University of Southern Denmark, Odense, Denmark

<sup>4</sup>Centre for Child and Adolescent Mental Health, Capital Region Psychiatry, Copenhagen, Denmark

## **Author correspondence**

Andrea Spitz

Department of Child and Adolescent Psychiatry and Psychotherapy

University Hospital of Psychiatry

Neumünsterallee 9 P.O. Box 233

8032 Zurich

Email: [andrea.spitz@puk.zh.ch](mailto:andrea.spitz@puk.zh.ch)

Phone: +41 (0)43 499 26 26

Fax: +41 (0)43 499 26 02

## **Author contributions:**

A.S. analyzed the data and wrote the first draft of the paper with input from both authors. H.-C. S. was the principal investigator of the project and supervised and revised the manuscript.

### **Abstract**

Previous research has demonstrated the influence of family functioning on developmental outcomes but only a few studies have addressed the normative changes of family functioning during adolescence. While there is evidence that family adaptability is stable, findings regarding the development of family cohesion levels are controversial. The focus on the association of family functioning with parenting behaviour has also been quite limited. Some studies have revealed that an authoritative parenting style is connected with better family functioning, but only a small body of research has analyzed the association with the main dimensions of parenting behaviour.

The current study investigated developmental trajectories of family adaptability and cohesion from adolescence to young adulthood. The impact of sex, number of siblings, marital status, socioeconomic status and parenting behaviour was studied in a sample of N=619 participants from a longitudinal Swiss study at two measurement times. Repeated measures ANOVAs and cross-sectional linear regression models were used to analyse the data.

There was a significant developmental decline in perceived family cohesion but no change in adaptability from adolescence to young adulthood. In addition, there was a significant main effect of socioeconomic status on adaptability and of parental divorce on cohesion. Boys experienced a significantly steeper decline in family cohesion than girls. Adaptability was only predicted by perceived parental acceptance at both measurement times while cohesion was significantly predicted by perceived parental acceptance, psychological control, and structure. The findings reflect normative developmental processes in the transition period

**Keywords:** adaptability, cohesion, family functioning, adolescence, young adulthood

### **Highlights:**

- Family adaptability remains stable from adolescence to young adulthood but is affected by socioeconomic status
- Family cohesion declines over this period and is influenced by sex and parental divorce
- Perceived parental acceptance predicts higher family adaptability and cohesion
- Perceived psychological control is negatively and parental structure is positively correlated with family cohesion

## Introduction

Adolescence is a developmental period marked by individual cognitive, physical, emotional and social changes and additional factors such as relationships with family members, family structure, and family functioning also impact on development and well-being (Gauze, Bukowski, Aqan-Assee, & Sippola, 1996; Rask, Åstedt-Kurki, Paavilainen, & Laippala, 2003; Uruk, Sayger, & Cogdal, 2007). The Family Adaptability and Cohesion Evaluation Scales (FACES) represent a widely used tool of assessment in research for measuring the constructs of family adaptability and cohesion (Baer, 2002; Everri, Mancini, & Fruggeri, 2015; Hamilton & Carr, 2016; Olson, 2008; Parra, Oliva, & Reina, 2015). Family adaptability or flexibility relates to the ability of the family to adapt to leadership, role relationships and rules in response to stressful events. Cohesion is defined as the emotional bonds that family members have towards each other. According to Olson (2008) unbalanced, i.e. very low or excessive levels of adaptability or cohesion can lead to dysfunctional family systems.

The study of the impact of adaptability and cohesion on various psychological outcomes such as self-esteem, adjustment, behavioral and emotional problems, hopelessness or other psychological outcomes (Cruz, Narciso, Pereira, & Sampaio, 2014; Farrell & Barnes, 1993; Gorbett & Kruczek, 2008; Guassi Moreira & Telzer, 2015; Jagers et al., 2015; Joh, Kim, Park, & Kim, 2013; Parra, Oliva, & Sánchez-Queija, 2015) has gained substantial attention (Lucia & Breslau, 2006; Richmond & Stocker, 2006; Smets & Hartup, 1988; Uruk et al., 2007). In contrast, changes to these constructs during adolescence have not been studied as intensively and the available findings are controversial. Parra, Oliva and Reina (2015) argued that families may have acquired stable family functioning during childhood, but changes could occur to these structures later during ordinary adolescent development. These authors found increasing levels of cohesion from early adolescence to emerging adulthood, with the lowest cohesion levels in early adolescence. However, there were no changes in adaptability over the course of adolescence. Additional evidence for stable adaptability was observed in cross-sectional study by Scabini and Galimberti (1995). In contrast, two other studies by Feldman and Gherig (1988) and Baer (2002) revealed a significant decline in cohesion levels through adolescence.

Various factors might have an effect on these developmental processes. Findings of a potential impact of the sex of the adolescent are controversial. Some studies found evidence for a possible influence on cohesion with either adolescent girls perceiving higher levels of cohesion than boys (Scabini & Galimberti, 1995) or vice versa (Jagers et al., 2015), while other studies

failed to find any differences (Feldman & Gehring, 1988; Parra, Oliva, & Reina, 2015). To our knowledge there are no studies supporting a possible effect of sex on adaptability (Parra, Oliva, & Reina, 2015; Scabini & Galimberti, 1995). Since family functioning also involves additional family members and their relationships, it is conceivable that variables such as educational level of the parents, socioeconomic status (Mirnics, Vargha, Tóth, & Bagdy, 2010; Tsamparli & Halios, 2019), marital status (Baer, 1999; Waldren, Bell, Sorell, & Peek, 1990), or the presence of other siblings (Byrd, DeRosa, & Craig, 1993; Tsamparli & Halios, 2019) may exert an influence on the development of family functioning.

Besides these rather external and non-behavioral factors, there is evidence that parenting behavior is also associated with family functioning (Everri et al., 2015; Henry, Robinson, Neal, & Huey, 2006; Mupinga, Garrison, & Pierce, 2002). These associations are plausible as the three most common dimensions of parental behavior, namely, acceptance and support, structure and monitoring and psychological control include features overlapping with the dimensions of family functioning (Baumrind, 2016; Olson & Gorall, 2006). Therefore, accepting and supportive parenting behavior might lead to closer emotional bonds and, consequently, higher levels of family cohesion. Furthermore, adaptability might be linked to the parenting dimension of behavioral control (e.g. structure, parental monitoring and supervision). Various studies revealed that a rather authoritative parenting style as represented by high acceptance and support (encouraging and supporting behavior), high structure (supervision, behavioral control, rule setting and monitoring), and low psychological control (punishing behavior, mistrust and rejection) leads to more cohesive family bonds or higher family functioning (Matejevic, Todorovic, & Jovanovic, 2014; Mupinga et al., 2002; Olson & Gorall, 2006). However, there is only limited information about the impact of each of the main dimensions of parental behavior on family adaptability and cohesion. A study by Henry (2006) found diverging results for different factors of parental behavior and family functioning. Parental acceptance and support had the highest impact on family adaptability and cohesion while parental monitoring or structure had only a small effect. Based on rather limited evidence, it is likely to assume that psychological control is negatively correlated with cohesion and adaptability (Carvalho, Fernandes, & Relva, 2018).

With a specific interest in developmental trajectories during the transition period from late adolescence to young adulthood, the present study focused on changes of perceived family adaptability and cohesion. Furthermore, the associations of perceived family functioning and parental behavior were studied, and the impact of sex, socioeconomic status, number of siblings, and marital status were controlled for in the analyses. It was hypothesized that adaptability would

be stable while cohesion levels will decrease from adolescence to young adulthood. Additionally, we assumed an influence of marital status, number of siblings, and socioeconomic status, but not of sex on developmental changes in family cohesion and adaptability. We also hypothesized that higher levels of perceived parental acceptance and structure would predict higher levels in family cohesion and adaptability, while we assumed that psychological control would be negatively correlated with both family functioning variables.

## **Method**

### **Participants**

The sample was based on an original cohort of  $N = 1110$  preadolescents and adolescents aged 11 to 17 forming the longitudinal Zurich Adolescent Psychology and Psychopathology Study (ZAPPS). The cohort was a stratified randomized school-based sample representing the 12 counties of the canton of Zurich in Switzerland, which was studied longitudinally in 1994, 1997, 2001, 2004, and 2015-2018. A comprehensive description of the original sampling procedure can be found in Steinhausen, Winkler Metzke and Kannenberg (1997).

The sample of the present study included only those individuals who participated in the two waves of data collection in 1997 and 2001. Sample characteristics are summarized in table 1. The overall sample size was  $N = 619$  and the mean age at time 1 was 14.85 ( $SD = 0.08$ ) and at time 2 it was 18.45 ( $SD = 0.94$ ). Due to selective attrition, there were significantly more girls ( $\chi^2 = 11.67$ ,  $p = .001$ ) in the sample. The vast majority of 95.0% ( $n = 588$ ) participants were native Swiss. Further descriptions of the social variables used in the analyses can be found in Table 1.

### **Measures**

The present study was based on two questionnaires measuring family functioning and perceived parental behaviour. The Family Adaptability and Cohesion Evaluation Scales (FACES) III were originally developed by (Olson, Portner, & Lavee, 1985) with the intention to measure perceived family functioning, namely, family cohesion and adaptability and were conceptually based on the Circumplex Model of Family Functioning (Olson, Rusell, & Sprenkle, 1979).

The translated German version of the scales is a 20-item self-report questionnaire with each question answered on a 5-point scale (from “almost never” to almost always). Adaptability is defined as the ability of the family system to change in response to stress and comprises four subscales: control/family leadership, discipline, role allocation and rules. Cohesion refers to the degree of emotional bonding within the family and includes six subscales: emotional bond, family

boundaries, time management, friendships, decision making and leisure activities. These two main dimensions were also well replicated in factor analyses based on data from the ZAPPS samples collected in 1997 and 2001. Reliability coefficients amounted to  $\alpha = .61-.63$  for adaptability and  $\alpha = .86-.88$  for cohesion.

The second questionnaire named Zurich Perceived Parental Behavior Inventory (PPBI) originally consisted of 32 items (Reitzle, Winkler Metzke, & Steinhausen, 2001). 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 both measurement times. 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 (Reitzle et al., 2001).

The three identified scales were named “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 6 items. The scale “warmth and support” included comforting, affectionate, encouraging and supporting behavior as well as acceptance towards the child. “Psychological pressure” was comprised of inconsistencies in handling unwanted behavior, punishing behavior through psychological pressure, mistrust and rejection. The third scale “demands and control” reflected clear rules-setting, supervision, and monitoring behavior by the parents.

In a recent publication (Spitz, Winkler Metzke, & Steinhausen, 2019), the scales were renamed parental acceptance, psychological control, and structure in order to simplify the terminology and align with the conceptualization of recent research (Grolnick & Pomerantz, 2009; Soenens & Vansteenkiste, 2010; Steinberg, 2001). Additionally, we calculated an average sum score for both parents.

In addition to the two questionnaire scales, sex and three social variables were used for the present analyses. These variables included socioeconomic status (SES), number of siblings, and marital status (divorced vs. non divorced) and were based on a detailed questionnaire on social, family, and life circumstances at the time of the assessment during adolescence in 1997. Socioeconomic status was classified according to the profession and education of the main bread

winner into four strata, namely, lower class, lower middle class, upper middle class, and upper class.

### **Data analysis**

A series of repeated measures two-factorial analyses of variance (ANOVA) were computed to study changes in family structure from adolescence to young adulthood with adaptability and cohesion scores as dependent measures. In each analysis, time was considered as the first dichotomized (1997 and 2001) factor while sex, SES, number of siblings, and the presence of parental divorce were separately analyzed each as the second stratified factor with a potential additional impact.

In the second part of the analyses, linear regression models were conducted for each assessment to predict family adaptability and cohesion scores based on the three parental behavior scales. Besides sex, the social variables of SES, number of siblings, and marital status were also included in the regression models. All analyses were performed by using SPSS – package for Windows version 23 (IBM Corp.,2015.) Missing values occurred only among the parental behavior scales and amounted to < 1 % of the subjects, the respective cases were excluded in the analyses.

### **Results**

Detailed descriptive statistics of the FACES III and the PPBI scales at the two times can be found in Table 2. There were no significant sex differences in any of the scales across time. As Figures 1 and 2 and table 3 show, repeated measures ANOVAs revealed different results for adaptability and cohesion. Time did not have a significant impact on adaptability in any of the analyses, indicating that it is a rather stable construct in this time period. Furthermore, neither sex, nor number of siblings, nor parental divorce had a significant main effect on adaptability. However, there was a significant main effect of SES ( $F(3,615) = 4.04, p = .007$ ), meaning higher SES resulted in higher adaptability scores in the sample. All interactions between time and the other four variables were non-significant.

In contrast to adaptability, cohesion showed a significant decline in all analyses from adolescence to young adulthood. Among the various social variables, only divorce had a significant main effect in terms of decreasing cohesion scores. There was a significant interaction with sex

indicating that boys perceived stronger decline in cohesion than girls over time. No significant interaction was found for SES, number of siblings or parental divorce.

The findings from cross-sectional linear regression models are presented in tables 4 and 5 and show a significant regression equation at both times for perceived adaptability (T1:  $F(7,615) = 23.24, p < .001$ ; T2:  $F(7,613) = 24.96, p < .001$ ), and cohesion (T1:  $F(7,615) = 84.22, p < .001$ ; T2:  $F(7,613) = 76.03, p < .001$ ). At both times, the explained variance ( $R^2$ ) of the model was lower for adaptability than for cohesion. In the regression model for adaptability, perceived parental acceptance was significantly associated at both measurement times. Psychological control and structure did not significantly associate with adaptability. Higher perceived parental acceptance was associated with higher adaptability. Among the other variables considered in the equation, only higher SES was also significantly and positively associated with adaptability.

Cohesion was significantly associated with all three scales measuring perceived parental behaviour, namely, positively with both acceptance and structure and negatively with psychological control. In addition, there were significant associations with sex and parental divorce at T1 indicating that adolescent girls and divorced adolescents experienced less family cohesion. Overall, parental acceptance had the strongest association with both family adaptability and cohesion. The impact of the social variables on family structure was less relevant except the few above mentioned associations with SES and divorce. In particular, the size of the family as reflected in the number of siblings was irrelevant for both family structure variables at both times.

## Discussion

The aim of the present study was to investigate developmental changes of perceived family adaptability and cohesion from adolescence to young adulthood. Additionally, the associations of perceived family functioning and the main dimensions of perceived parental behavior were analyzed. Our results support the first hypothesis that perceived family adaptability remained stable and perceived cohesion declined from adolescence to young adulthood. The findings are in line with the results by Baer (2002) and Feldman and Ghering (1988) and also partially supportive of the findings by Scabini and Galimberti (1995) and Parra et al. (2015) regarding the stability of adaptability. The decline of perceived cohesion levels was in contrast to the results found by Parra et al. (2015). However, their study consisted of a smaller sample size and the increase of cohesion was mostly observable from early adolescence to middle adolescence.

Regarding the potential influence of sex, we found no effect on adaptability and only a significant interaction with perceived cohesion. The non-existent sex differences regarding adaptability are in line with studies by Parra et al. (2015) and Scabini and Galimberti (1995) and the significant interaction with cohesion may also reflect the contradicting results in previous research (Jaggers et al., 2015; Scabini & Galimberti, 1995). While both boys and girls showed a decline in cohesion during this age span, boys had a steeper decline. Girls experienced their families as less cohesive at the first measurement time but showed higher levels than boys at the second measurement time. According to these results, sex has an age-dependent influence on the perception of family cohesion.

While the number of siblings did not have an impact on either family adaptability or cohesion, SES showed a significant main effect on perceived adaptability and parental divorce on perceived cohesion. Families with a higher SES were seen as more adaptable by their youth. This finding is in accordance with other studies indicating that a higher educational level and higher income of the parents was generally associated with lower parental stress and conflict and better coping strategies (Mirnics et al., 2010; Tsamparli & Halios, 2019). However, the present study failed to find similar associations with perceived family cohesion indicating that the ability to adapt leaderships and rules might depend on familial SES, rather than on the emotional bonds between family members.

Parental divorce did not have an influence on parental adaptability and it also did not change the decline in perceived cohesion, but adolescents with divorced parents generally showed lower levels of cohesion. This finding is in line with the results from other studies that have revealed lower levels of cohesion in single-parent or remarried families (Baer, 1999; Waldren et al., 1990) due to higher levels of conflict. In contrast, our results did not confirm the finding by Waldren, Bell, Sorell and Peek (1990) of lower adaptability levels in remarried families. However, we only had information about the marital status and no further information about the family structure (e.g. stepparents, new partner, remarriage). Furthermore, in our sample we did not observe any influence of the number of siblings on either adaptability or cohesion. Other studies have revealed an effect of the presence of siblings on family functioning but they used other variables like quality of sibling relationships (Tsamparli & Halios, 2019) or sibling position (Byrd et al., 1993). Therefore, one may assume that the number of siblings alone is less likely to exert an influence on family structure but rather the qualitative characteristics of the sibling relationship.

The cross-sectional results of two measurement times regarding the influence of perceived parenting behavior on adaptability and cohesion revealed that generally both family functioning dimensions were predicted by perceived parental acceptance. Additionally, perceived cohesion was also predicted by the other dimensions of psychological control and structure. However, at time 2 the effect of structure on perceived cohesion was not significant anymore. While high acceptance and supportive parenting behavior was associated with flexible family structure, the levels of psychological control and structure did not correlate significantly with family adaptability. In contrast, perceived family cohesion was also predicted by lower levels of psychological control and higher levels of parental structure, but these results had relatively low beta values compared to parental acceptance. Disregarding the dimension of parenting structure, there was no evidence for an age effect. However, these analyses were cross-sectional and must be verified in a model based on longitudinal data. Our hypothesis about the associations between parental behavior and family functioning was partly confirmed. While there was an association of all three parenting dimensions with perceived family cohesion, only perceived parental acceptance was significantly related to perceived family adaptability. There is a strong convergence of these results with findings from previous research (Carvalho et al., 2018; Henry et al., 2006; Matejevic et al., 2014; Mupinga et al., 2002; Olson & Gorall, 2006).

In terms of strengths and limitations, the present study profited from a large sample size, separate analyses of different characteristics of family structure and parental behaviour, and the inclusion of two waves of data within a repeated measure design. Although the two measurement times marked the developmentally sensitive transition period from late adolescence to young adulthood, future research might benefit from a more fine-grained time pattern of the longitudinal design to study developmental trajectories in more detail starting in early adolescence, throughout the whole period of adolescence, and ending in middle adulthood when participants may have their own families. Although we included several correlates and potential determinants of family functioning, future research might include more detailed characteristics of the family structure like living with stepparents, remarriage, birth order or sex of the siblings.

In terms of implications, the findings of the present study strengthen the body of research on normative developmental changes of family functioning variables. It has also provided information about potential factors that may contribute to an improvement of family functioning. A general decline in cohesion is normal from late adolescence to young adulthood, and parental acceptance and support especially seems to predict higher family cohesion and adaptability. This information can be used in counselling and treatment to safeguard against an overinterpretation of

a decline in family cohesion in transition periods and to recognize that parental acceptance and support continue to be important factors in late adolescence in helping to maintain an adaptable family structure and higher levels of emotional bonding within the family.

In conclusion, the present study documents the developmental changes in perceived adaptability and cohesion from adolescence to young adulthood, as well as the impact of perceived parental acceptance, psychological control and structure. Future studies might study these normative developmental trajectories over the entire adolescent period into advanced adulthood and include more detailed information regarding the family composition.

### **Compliance with Ethical Standards**

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.

### **Disclosures**

AS reports no conflict of interest. In the past three years, HCS worked as a speaker for Medice and has received book royalties from Cambridge University Press, Elsevier, Hogrefe, Huber, Klett, and Kohlhammer publishers.

## References

- Baer, J. (1999). The effects of family structure and SES on family processes in early adolescence. *Journal of Adolescence*, 22(3), 341–354. <https://doi.org/10.1006/jado.1999.0226>
- Baer, J. (2002). Is Family Cohesion a Risk or Protective Factor During Adolescent Development? *Journal of Marriage and Family*, 64(3), 668–675. <https://doi.org/10.1111/j.1741-3737.2002.00668.x>
- Baumrind, D. (2016). The Influence of Parenting Style on Adolescent Competence and Substance Use. *The Journal of Early Adolescence*, 11(1), 56–95. <https://doi.org/10.1177/0272431691111004>
- Byrd, B., DeRosa, A. P., & Craig, S. S. (1993). The adult who is an only child: achieving separation or individuation. *Psychological Reports*, 73(1), 171–177. <https://doi.org/10.2466/pr0.1993.73.1.171>
- Carvalho, J., Fernandes, O. M., & Relva, I. C. (2018). Family Functioning and Its Relation to Parental Discipline. *Child and Adolescent Social Work Journal*, 35(1), 31–44. <https://doi.org/10.1007/s10560-017-0501-9>
- Cruz, D., Narciso, I., Pereira, C. R., & Sampaio, D. (2014). Risk Trajectories of Self-Destructiveness in Adolescence: Family Core Influences. *Journal of Child and Family Studies*, 23(7), 1172–1181. <https://doi.org/10.1007/s10826-013-9777-3>
- Everri, M., Mancini, T., & Fruggeri, L. (2015). Family Functioning, Parental Monitoring and Adolescent Familiar Responsibility in Middle and Late Adolescence. *Journal of Child and Family Studies*, 24(10), 3058–3066. <https://doi.org/10.1007/s10826-014-0109-z>
- Farrell, M. P., & Barnes, G. M. (1993). Family Systems and Social Support: A Test of the Effects of Cohesion and Adaptability on the Functioning of Parents and Adolescents. *Journal of Marriage and the Family*, 55(1), 119. <https://doi.org/10.2307/352963>
- Feldman, S. S., & Gehringer, T. M. (1988). Changing Perceptions of Family Cohesion and Power across Adolescence. *Child Development*, 59(4), 1034. <https://doi.org/10.2307/1130269>
- Gauze, C., Bukowski, W. M., Aquan-Assee, J., & Sippola, L. K. (1996). Interactions between Family Environment and Friendship and Associations with Self-Perceived Well-Being during Early Adolescence. *Child Development*, 67(5), 2201–2216. <https://doi.org/10.1111/j.1467-8624.1996.tb01852.x>
- Gorbett, K., & Kruczek, T. (2008). Family Factors Predicting Social Self-Esteem in Young Adults. *The Family Journal*, 16(1), 58–65. <https://doi.org/10.1177/1066480707309603>

- Grolnick, W. S., & Pomerantz, E. M. (2009). Issues and Challenges in Studying Parental Control: Toward a New Conceptualization. *Child Development Perspectives*, 3(3), 165–170.  
<https://doi.org/10.1111/j.1750-8606.2009.00099.x>
- Guassi Moreira, J. F., & Telzer, E. H. (2015). Changes in family cohesion and links to depression during the college transition. *Journal of Adolescence*, 43, 72–82.  
<https://doi.org/10.1016/j.adolescence.2015.05.012>
- Hamilton, E., & Carr, A. (2016). Systematic Review of Self-Report Family Assessment Measures. *Family Process*, 55(1), 16–30. <https://doi.org/10.1111/famp.12200>
- Henry, C. S., Robinson, L. C., Neal, R. A., & Huey, E. L. (2006). Adolescent perceptions of overall family system functioning and parental behaviors. *Journal of Child and Family Studies*, 15(3), 308–318. <https://doi.org/10.1007/s10826-006-9051-z>
- IBM Corp. Released 2015. IBM SPSS Statistics for Windows (Version Version 23.0) [Computer software]. Armonk, NY: IBM Corp.
- Jaggers, J. W., Church, W. T., Tomek, S., Hooper, L. M., Bolland, K. A., & Bolland, J. M. (2015). Adolescent Development as a Determinant of Family Cohesion: A Longitudinal Analysis of Adolescents in the Mobile Youth Survey. *Journal of Child and Family Studies*, 24(6), 1625–1637. <https://doi.org/10.1007/s10826-014-9966-8>
- Joh, J. Y., Kim, S., Park, J. L., & Kim, Y. P. (2013). Relationship between Family Adaptability, Cohesion and Adolescent Problem Behaviors: Curvilinearity of Circumplex Model. *Korean Journal of Family Medicine*, 34(3), 169–177. <https://doi.org/10.4082/kjfm.2013.34.3.169>
- Lucia, V. C., & Breslau, N. (2006). Family cohesion and children's behavior problems: a longitudinal investigation. *Psychiatry Research*, 141(2), 141–149.  
<https://doi.org/10.1016/j.psychres.2005.06.009>
- Matejevic, M., Todorovic, J., & Jovanovic, A. D. (2014). Patterns of Family Functioning and Dimensions of Parenting Style. *Procedia - Social and Behavioral Sciences*, 141, 431–437.  
<https://doi.org/10.1016/j.sbspro.2014.05.075>
- Mirnic, Z., Vargha, A., Tóth, M., & Bagdy, E. (2010). Cross-Cultural Applicability of FACES IV. *Journal of Family Psychotherapy*, 21(1), 17–33.  
<https://doi.org/10.1080/08975351003618577>
- Mupinga, E. E., Garrison, M. E. B., & Pierce, S. H. (2002). An Exploratory Study of the Relationships between Family Functioning and Parenting Styles: The Perceptions of Mothers

- of Young Grade School Children. *Family and Consumer Sciences Research Journal*, 31(1), 112–129. <https://doi.org/10.1177/1077727X02031001005>
- Olson, D., Rusell, C., & Sprenkle, D. (1979). Circumplex model of family functioning. *Handbook in Family Medicine*.
- Olson, D. H. (2008). Circumplex Model of Marital and Family Systems. *Journal of Family Therapy*, 22(2), 144–167. <https://doi.org/10.1111/1467-6427.00144>
- Olson, D. H., & Gorall, D. M. (2006). Faces IV and the Circumplex model. *Minneapolis, MN: Life Innovations*.
- Olson, D. H., Portner, J., & Lavee, Y. (1985). Family adaptability and cohesion evaluation scales (FACES III). *St. Paul: University of Minnesota, Family Social Science*.
- Parra, A., Oliva, A., & Reina, M. d. C. (2015). Family Relationships From Adolescence to Emerging Adulthood. *Journal of Family Issues*, 36(14), 2002–2020. <https://doi.org/10.1177/0192513X13507570>
- Parra, A., Oliva, A., & Sánchez-Queija, I. (2015). Development of emotional autonomy from adolescence to young adulthood in Spain. *Journal of Adolescence*, 38, 57–67. <https://doi.org/10.1016/j.adolescence.2014.11.003>
- Rask, K., Åstedt-Kurki, P., Paavilainen, E., & Laippala, P. (2003). Adolescent subjective well-being and family dynamics. *Scandinavian Journal of Caring Sciences*, 17(2), 129–138. <https://doi.org/10.1046/j.0283-9318.2002.00118.x>
- Reitzle, M., Winkler Metzke, C., & Steinhausen, H.-C. (2001). Eltern und Kinder: Der Zürcher Kurzfragebogen zum Erziehungsverhalten (ZKE). *Diagnostica*, 47(4), 196–207. <https://doi.org/10.1026//0012-1924.47.4.196>
- Richmond, M. K., & Stocker, C. M. (2006). Associations between family cohesion and adolescent siblings' externalizing behavior. *Journal of Family Psychology : JFP : Journal of the Division of Family Psychology of the American Psychological Association (Division 43)*, 20(4), 663–669. <https://doi.org/10.1037/0893-3200.20.4.663>
- Scabini, E., & Galimberti, C. (1995). Adolescents and young adults: A transition in the family. *Journal of Adolescence*, 18(5), 593–606. <https://doi.org/10.1006/jado.1995.1041>
- Smets, A. C., & Hartup, W. W. (1988). Systems and symptoms: family cohesion/adaptability and childhood behavior problems. *Journal of Abnormal Child Psychology*, 16(2), 233–246. <https://doi.org/10.1007/BF00913598>

- 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. *Developmental Review, 30*(1), 74–99. <https://doi.org/10.1016/j.dr.2009.11.001>
- Spitz, A., Winkler Metzke, C., & Steinhausen, H.-C. (2019). Growth trajectories of perceived parental behavior during adolescence: Manuscript submitted for publication.
- Steinberg, L. (2001). We Know Some Things: Parent-Adolescent Relationships in Retrospect and Prospect. *Journal of Research on Adolescence, 11*(1), 1–19. <https://doi.org/10.1111/1532-7795.00001>
- Steinhausen, H. C., Winkler Metzke, C., Meier, M., & Kannenberg, R. (1997). Behavioral and emotional problems reported by parents for ages 6 to 17 in a Swiss epidemiological study. *European Child & Adolescent Psychiatry, 6*(3), 136–141. <https://doi.org/10.1007/BF00538985>
- Tsamparli, A., & Halios, H. (2019). Quality of sibling relationship and family functioning in Greek families with school-age children. *Journal of Psychologists and Counsellors in Schools, 29*(2), 190–205. <https://doi.org/10.1017/jgc.2019.9>
- Uruk, A. Ç., Sayger, T. V., & Cogdal, P. A. (2007). Examining the Influence of Family Cohesion and Adaptability on Trauma Symptoms and Psychological Well-Being. *Journal of College Student Psychotherapy, 22*(2), 51–63. [https://doi.org/10.1300/J035v22n02\\_05](https://doi.org/10.1300/J035v22n02_05)
- Waldren, T., Bell, N. J., Sorell, G., & Peek, C. (1990). Cohesion and Adaptability in Post-Divorce Remarried and First Married Families. *Journal of Divorce & Remarriage, 14*(1), 13–28. [https://doi.org/10.1300/J087v14n01\\_03](https://doi.org/10.1300/J087v14n01_03)

**Tables and Figures**

**Table 1**

*Descriptive Sample Statistics*

	N	%
Girls	352	56.9
Boys	267	43.1
Divorced parents		
At T1	133	21.5
At T2	97	15.7
Siblings	574	92.7
Single child	45	7.3
One sibling	283	45.7
2+ siblings	29.1	47.0
Socioeconomic status		
Lower class	82	13.2
Lower middle class	365	59
Upper middle class	123	19.9
Upper class	49	7.9

**Table 2***Descriptive Statistics of Adaptability, Cohesion, and Parental Behavior Scores at Two Assessment Times*

	Total				Girls			Boys			Sex differences	
	N	M	SD	Range	M	SD	Range	M	SD	Range	T	<i>p</i>
Adaptability T1	619	19.63	5.33	1.73-34	19.60	5.64	1.73-34	19.67	4.89	6-30	.16	.87
Adaptability T2	619	19.97	5.11	1-36	20.27	5.26	1-36	19.57	4.88	4-32	-1.71	.09
Cohesion T1	619	24.45	6.83	2-40	24.17	7.19	2-40	24.83	6.33	5-39	1.19	.24
Cohesion T2	619	23.63	7.19	2-40	23.89	7.55	2-40	23.29	6.69	2-38	-1.02	.31
Acceptance T1	616	24.91	5.78	3-36	25.06	6.02	3-36	24.72	5.46	7-36	-.71	.48
Acceptance T2	614	26.41	5.79	3.5-36	26.76	5.76	4.5-36	25.95	5.80	3.5-36	-1.71	.09
Psychological Control T1	616	6.55	4.27	0-25.5	6.34	4.49	0-25.5	6.83	3.96	0-22	1.43	.15
Psychological Control T2	614	4.63	3.77	0-21.5	4.47	3.85	0-21.5	4.84	3.65	0-16	1.21	.23
Structure T1	616	10.44	3.40	1-18	10.25	3.45	1-18.0	10.68	3.31	2-18	1.55	.12
Structure T2	614	8.52	3.47	0.5-18	8.59	3.54	0.5-18	8.43	3.36	1-16.5	-.57	.57

**Table 3**

*Summary Statistics of Repeated Analyses of Variance for Adaptability and Cohesion.*

	<i>Adaptability</i>			<i>Cohesion</i>		
	F	df	<i>p</i>	F	df	<i>p</i>
<i>Model A</i>						
Time	1.65	1,617	.20	11.17	1,617	.001
Sex	.79	1,617	.38	.004	1,617	.95
Time*sex	3.03	1,617	.08	5.32	1,617	.02
<i>Model B</i>						
Time	.94	1,615	.33	7.61	1,615	.006
SES	4.04	3,615	.007	.48	3,615	.70
Time*SES	.75	3,615	.52	.56	3,615	.64
<i>Model C</i>						
Time	.79	1,616	.38	7.7	1,616	.006
Number of siblings	.48	2,616	.62	.83	2,616	.44
Time*number of siblings	.28	2,616	.76	.39	2,616	.67
<i>Model D</i>						
Time	3.11	1,617	.08	5.55	1,617	.02
Parental divorce	.22	1,617	.64	9.28	1,617	.002
Time*parental divorce	.78	1,617	.38	.06	1,617	.80

**Table 4**

*Cross-sectional Prediction of Adaptability and Cohesion at Time 1*

	<i>Adaptability</i>				<i>Cohesion</i>					
	$R^2$	$\beta^a$	95% CI		<i>p</i>	$R^2$	$\beta^a$	95% CI		<i>p</i>
			lower	upper				lower	upper	
	.20					.49				
Acceptance		.43	.32	.48	<.001		.61	.65	.81	<.001
Psychological control		-.04	-.16	.07	.46		-.14	-.35	-.11	<.001
Structure		-.07	-.23	.02	.11		.09	.06	.32	.005
Sex		-.02	-1.02	.51	.51		-.06	-1.68	-.10	.027
SES		.04	-.21	.78	.25		-.03	-.78	.24	.30
Number of siblings		.04	-.29	.94	.30		-.003	-.66	.60	.92
Parental divorce		-.01	-1.15	.93	.84		-.06	-2.13	.01	.05

*Note.* <sup>a</sup>Standardized Beta

**Table 5***Cross-sectional Prediction of Adaptability and Cohesion at Time 2*

	<i>Adaptability</i>				<i>Cohesion</i>					
	<i>R</i> <sup>2</sup>	<i>β</i> <sup>a</sup>	<i>95% CI</i>		<i>p</i>	<i>R</i> <sup>2</sup>	<i>β</i> <sup>a</sup>	<i>95% CI</i>		<i>p</i>
			lower	upper				lower	upper	
	.21					.46				
Acceptance		.42	.29	.44	<.001		.63	.70	.88	<.001
Psychological control		-.07	-.22	.04	.17		-.09	-.32	-.03	.02
Structure		.006	-.11	.13	.88		.07	.00	.28	.05
Sex		.04	-.34	1.12	.30		-.01	-1.00	.70	.73
SES		.10	.18	.11	.007		-.04	-.88	.21	.23
Number of siblings		.001	-.58	.59	.98		-.003	-.72	.64	.91
Parental divorce		.05	-.28	1.51	.18		-.02	-1.47	.61	.42

*Note.* <sup>a</sup>Standardized Beta

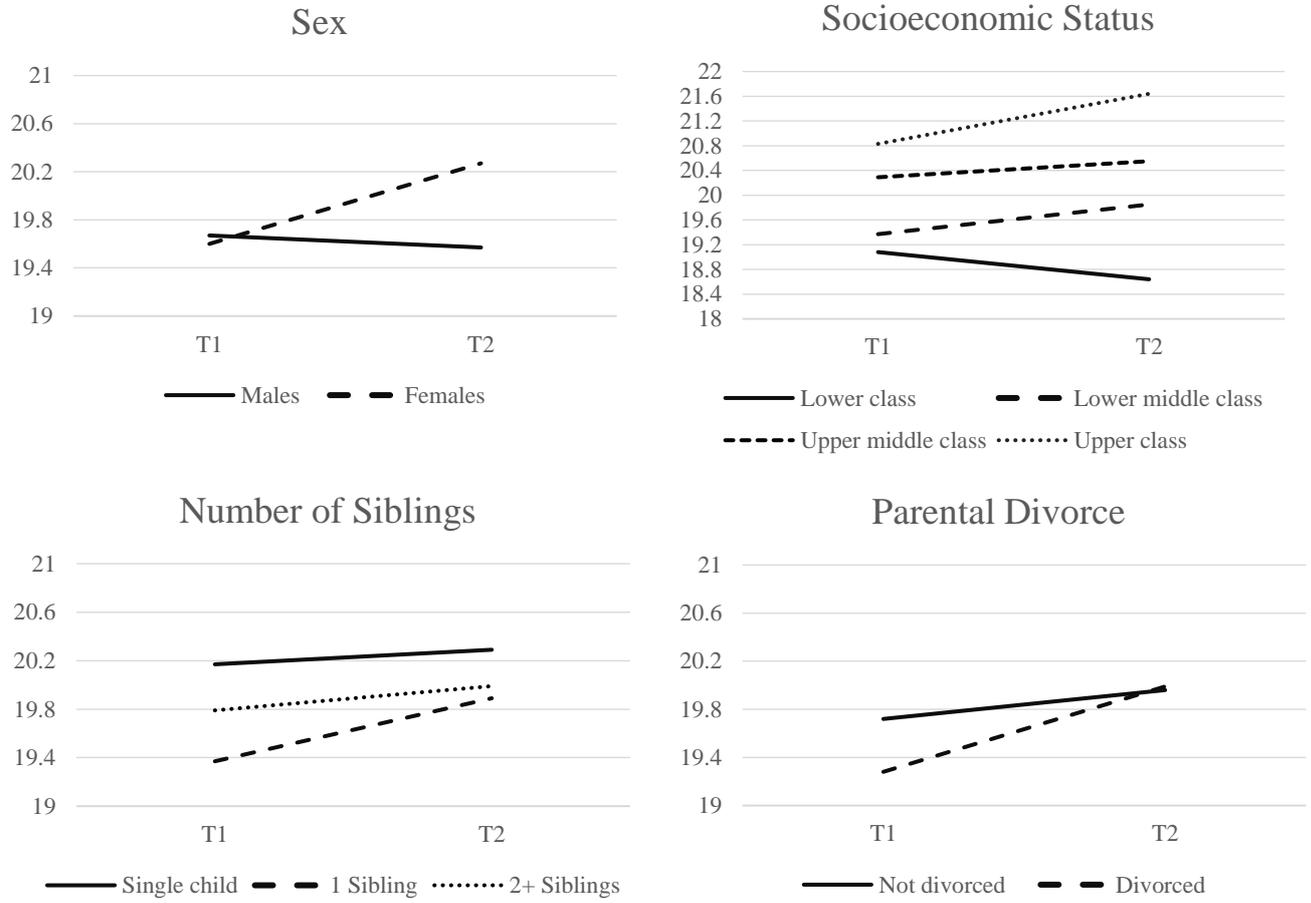


Figure 1. Association of Sex, Socioeconomic Status, Number of Siblings, and Parental Divorce with Family Adaptability across Time

Development of Family Functioning in Youth

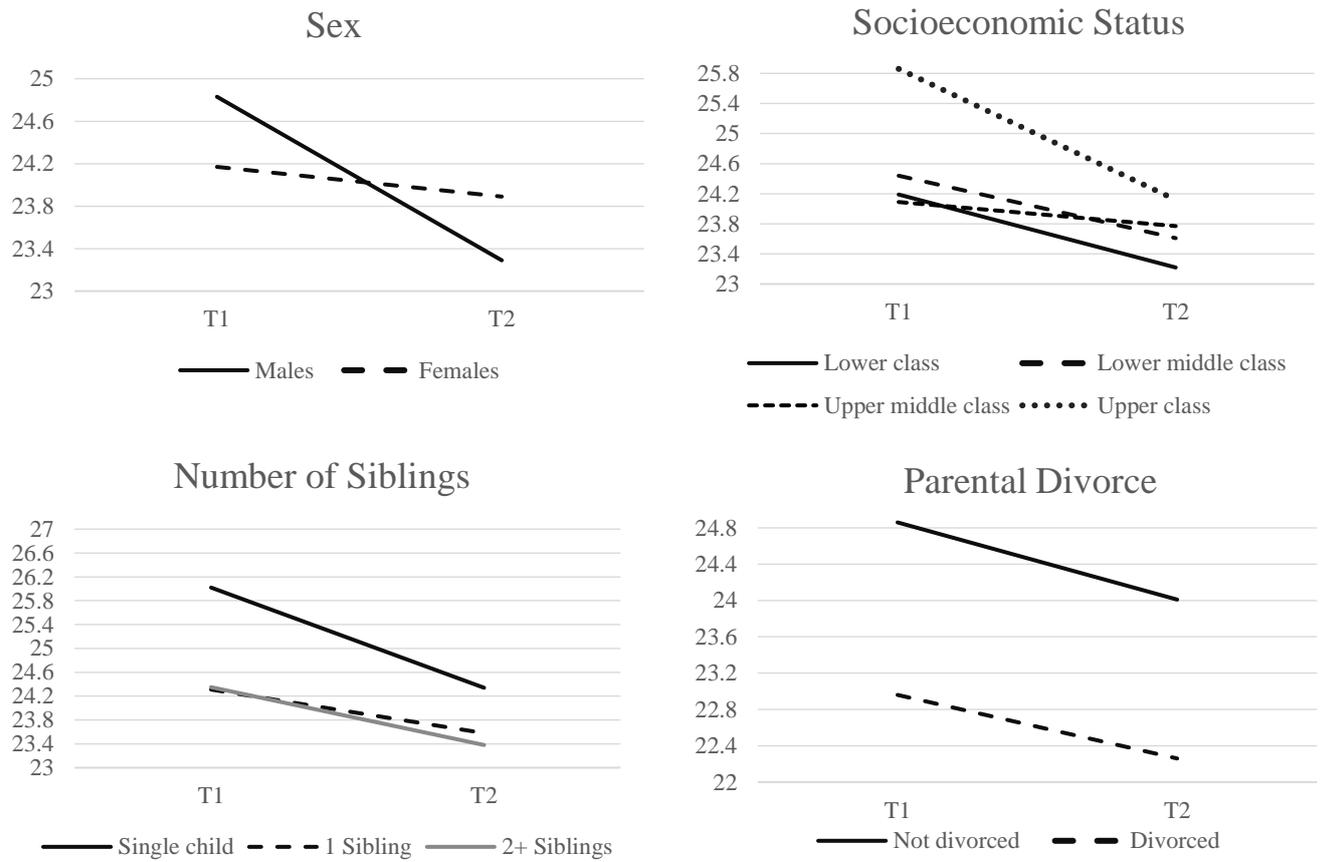


Figure 2. Association of Sex, Socioeconomic Status, Number of Siblings, and Parental Divorce with Family Cohesion across Time