Childhood Personality Predicts Long-Term Trajectories of Shyness and Aggressiveness in the

Context of Demographic Transitions in Emerging Adulthood

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**Abstract**

In an 19-year longitudinal study, childhood personality characteristics (assessed by teachers at ages 4 to 6) were significantly related to both initial levels and changes in parental judgments of shyness and aggressiveness. Long-term stability was demonstrated by the fact that overcontrollers had constantly higher scores in shyness, and undercontrollers in aggressiveness. However, undercontrollers' shyness and overcontrollers' aggressiveness changed over time from a low to a high level. Also, both types assumed adult social roles at a later time than the resilient participants, such as leaving the parental home, establishing a first romantic relationship, and getting a part-time job. A mediation analysis indicated that under- and overcontrollers' increasing aggressiveness between age 17 and 23 was due to their longer latency of getting a part-time job. Together, results demonstrate the importance of considering person-environment transactions in explaining both change and stability in personality between childhood and adulthood.

145 words

Findings from a number of longitudinal studies have shown that childhood personality predicts important life outcomes in adulthood, such as interpersonal relations, psychopathology, occupational attainment, and crime (Caspi, 2000; Caspi, Elder, & Bem, 1987; Caspi & Silva, 1995; Shiner, Masten, & Roberts, 2003). This substantial degree of continuity has been explained by formative early experiences (e.g., attachment), stable genetic influences, and stable environments (Fraley & Roberts, 2005). However, much of the available evidence is based on bivariate correlations between two time points, so little is known about the *shape* of the developmental trajectory between childhood and adulthood. In addition, there is a lack of studies that empirically demonstrate the theoretically important role of demographic transitions in shaping normative and idiosyncratic trajectories (Roberts & Pomerantz, 2004; Roberts, Wood, & Smith, 2005) during this age period. The current study set out to address these limitations in asking whether childhood personality predicts longitudinal trajectories of shyness and aggressiveness, and whether these trajectories are influenced by developmental transitions in a "demographically dense" (Rindfuss, 1991) period of the life span: emerging adulthood.

A small but increasing number of recent studies have looked empirically at the interaction between people's stable characteristics and their adaptation to the environment in explaining personality development. For example, Shiner, Masten, and Tellegen (2002) looked at the association between personality and social adjustment in childhood (mean age = 10 years) and young adulthood (mean age = 20 years) in 202 individuals and showed that childhood personality predicts both adult personality and adjustment. In addition, they showed that childhood adjustment was related to adult personality, even after controlling for the influence of childhood personality. Second, Neyer and Asendorpf (2001) followed a representative sample of 489 young adults across a four-year period and found that the transition to establishing a romantic partnership predicted changes in neuroticism. Finally,

Roberts, Caspi, and Moffitt (2003) studied the association between work experiences and personality development between ages 18 and 26 and found that personality not only predicted later work experiences but that work experiences were also related to personality change during this time period. Together, these results suggest that personality can change as a result of life experiences.

One of the theories that can explain the mediating processes underlying personality development is Roberts and colleagues' (2005) Social Investment Theory (see also Pals, 1999). This theory states that personality matures when people take on responsibility in their social roles. Specifically, as people establish stable romantic relationships, start a career, and become involved in community life, they become more socially dominant, agreeable, conscientious, and emotionally stable (Roberts et al., 2005). Such a mechanism may explain the well-documented normative development towards personality maturation in young adults (Neyer & Asendorpf, 2001; Robins, Fraley, Roberts, & Trzesniewski, 2001; Srivastava, John, Gosling, & Potter, 2003). If this is true, personality change may be environmentally mediated instead of genetically endogenous, as some theorists have proposed (McCrae et al., 2000).

One of the periods in which personality maturation and taking up responsibility in social roles go hand in hand is emerging adulthood (Arnett, 2000). During this time, which lasts from 18 to 25 years in Western, industrialized countries, individuals are expected to become gradually independent of their parents. According to Arnett (2000), subjective assessments of character maturity matter most to individuals as subjective hallmarks of this development, yet demographic transitions such as becoming financially independent or parenthood are also important as indicators. The fascinating thing about emerging adulthood, however, is that there are no clear norms about when this process needs to be completed. Accordingly, this period offers a unique window of opportunity for individual differences in life course biographies that may alter the trajectory of personality development.

## The Predictive Validity of Personality Types

Bergman (1998) defined a type as a class in a classification system of possible intra-individual configurations of dimensions. In personality psychology, a type thus represents the patterning of personality traits within the individual. Research on children's personality as measured by the California Child Q-set (J. H. Block & Block, 1980) has consistently identified three major personality types: resilients, overcontrollers, and undercontrollers (Asendorpf & van Aken, 1999; Hart, Atkins, & Fegley, 2003; Hart, Hofmann, Edelstein, & Keller, 1997; Robins, John, Caspi, Moffitt, & Stouthamer-Loeber, 1996; van Aken, van Lieshout, Scholte, & Haselager, 2002). The labels for these types refer to the theory of ego-control and ego-resiliency by J. H. Block and J. Block (1980). In this model of personality, ego-resiliency refers to the tendency to respond flexibly rather than rigidly to changing situational demands, particularly stressful situations. Ego-control refers to the tendency to contain versus express emotional and motivational impulses.

Studies of the resilient, undercontrolled, and overcontrolled personality types (subsequently called RUO types) identified in childhood found consistent relations with markers of social and cognitive competence (Asendorpf & van Aken, 1999; Hart et al., 2003; Hart et al., 1997; Robins et al., 1996; van Aken et al., 2002; Weir & Gjerde, 2002). Resilients have slightly more socially desirable scores on the Big Five dimensions of personality (John & Srivastava, 1999; e.g., above-average emotional stability) and above-average IQ and academic achievement. Overcontrollers are characterized by low scores on extraversion, emotional stability and self-esteem, and high scores on shyness or social withdrawal; thus, they show internalizing tendencies (Achenbach & Edelbrock, 1981). Undercontrollers are characterized by low scores on emotional stability, agreeableness, and conscientiousness, and high scores on aggressiveness; thus, they show externalizing tendencies (Achenbach &

Edelbrock, 1981). In addition, undercontrollers score lower on measures of intelligence and school achievement.

According to J. Block and Kremen (1996), ego resiliency and control are important resources in people's "ability to equilibrate and reequilibrate in response to their ever-changing being and the ever-changing world" (p. 349). Thus, the RUO types are ideal candidates to study individuals' reactions to the fluctuating environmental demands that are characteristic of the transition into adulthood. To date, this prediction has been most clearly confirmed in the Dunedin Longitudinal Study that followed a large, representative sample of New Zealand children from age 3 into adulthood. The children were classified by cluster analysis into five personality types based on behavior observations in various situations at age 3 (Caspi & Silva, 1995). The well-adjusted children in this study (40% of the sample) are similar to the resilient Q-type, the undercontrollers (10%) are similar to the undercontrolled Q-type, and the inhibited children (8%) are similar to the overcontrolled Q-type (it should be noted, however, that these types were smaller and thus more extreme than the three Q-types). Consistent with the theoretical framework of J.H. Block and J. Block (1980), the inhibited children showed internalizing, and the undercontrolled children externalizing tendencies at ages 18, 21, and 26 (Caspi, 2000; Caspi, Harrington, Milne, Amell, Theodore, & Moffitt, 2003; Caspi & Silva, 1995).

**The Present Study**

As stated previously, the present research will investigate whether childhood personality is able to predict longitudinal trajectories of shyness and aggressiveness between ages 4 and 23. By focusing on shyness and aggressiveness, the current study concentrates on two highly fundamental styles of "moving away from" and "moving against" the outside world, respectively (Caspi et al., 1987; Caspi, Elder, & Bem, 1988; Horney, 1950). Because shyness and aggressiveness represent internalizing and externalizing tendencies, respectively,

linking these variables to the RUO types provides a theoretically interesting opportunity for the long-term construct validation of the latter. Specifically, overcontrolled children, who suppress spontaneous impulses that could otherwise facilitate social interaction, should be more likely to develop long-terms patterns of shyness. Undercontrolled individuals, on the other hand, should be less able to suppress socially undesirable impulses, leading to long-term patterns of acting-out behavior, such as aggressiveness. However, the dynamic interplay between the individual and his or her environment may also result in more complex trajectories of adjustment that can only be uncovered by means of carefully designed longitudinal studies. The current study included nine assessments of shyness and aggressiveness. To our knowledge, no other study of this type includes as many reassessments of the same or similar variables, allowing for a uniquely fine-grained picture of developmental trends.

Another key objective of the current research is an investigation of the impact of personality dispositions on individuals' demographic transitions in emerging adulthood. As Arnett (2000) has repeatedly stated, this period is characterized by a lack of clear norms regarding the timing and sequence of these transitions, allowing for a substantial degree of individual choice and variability. Though some studies have looked at the association between personality variables such as shyness and having an explosive interaction style on demographic factors such as work and marital status (Caspi et al., 1987, 1988), results have not been interpreted in the light of the theory of emergent adulthood (Arnett, 2000). Also, to our knowledge, no previous research has linked the RUO personality types to demographic transitions indicating the assumption of adult roles.

By investigating the life history correlates of personality types and linking them to longitudinal changes in aggressiveness and shyness, the current study takes a life-span perspective at the issue of personality development (Baltes & Smith, 2004). That is, it shall

not only be tried to link childhood personality with intra-individual trajectories of aggressiveness and shyness between age 4 and 23, but also to investigate whether this association is mediated by the mastery of demographic transitions typical of emerging adulthood. Specifically, it shall be tested whether childhood personality types predict the timing of three key transitional moments: leaving the parental home, establishing a romantic relationship, and entering the world of (part-time) work. Also, it shall be tested whether this timing predicts changes in aggressiveness and shyness in emerging adulthood. Thus, the current study tries to answer a call by Roberts and Pomerantz (2004) for more process-oriented models to understand personality consistency and change.

The present study analyzed the same longitudinal sample and the same Q-types used by Asendorpf and van Aken (1999), and Asendorpf (2003). Because Q-types were derived from teacher Q-sorts, whereas the developmental outcomes were parental judgments and intelligence tests, the influence of shared method variance (e.g., self-enhancement bias in self-ratings) could be limited. Also, the Q-types were based on three Q-sorts for each child obtained each year between ages 4 to 6; thus, the types reflect stable characteristics of children's early personality organization. With regard to the outcome variables, the current study used data of the most recent assessment of this longitudinal sample when the participants were 23 years old, whereas earlier reports only included information up to age 12, or age 17. Thus, by the time of the most recent assessment, participants have made the transition from adolescence (roughly the period between age 10 and 18) to emerging adulthood (the period between 18 and 25; Arnett, 2000), offering a unique opportunity for studying the effect of assuming adult roles on personality change.

## Hypotheses

To summarize, the current study addresses three sets of research questions. First of all, childhood personality types were used to predict intra-individual trajectories of shyness and

aggressiveness. Based on previous research, the following hypotheses were tested:

(1) Overcontrollers are judged as shyer, less emotionally stable, and less extraverted than the remaining participants.

(2) Undercontrollers are judged as higher in aggressiveness and lower in emotional stability, agreeableness, and conscientiousness than the remaining participants.

As a second set of hypotheses, it is tested whether childhood characteristics are able to predict individual differences in the timing of demographic transitions indicative of assuming adult responsibilities. In this regard, the following hypotheses were addressed:

(3) Resilients start assuming adult responsibilities at a younger age than overcontrollers and undercontrollers.

(4) Taking on adult responsibilities, such as leaving the parental house, finding a part-time job, and committing oneself to a romantic relationship, are associated with increased personality maturity in the form of reduced shyness and aggressiveness levels.

Third and finally, answering a call for more process-oriented account of lifespan development (Roberts & Pomerantz, 2004), the current study tests the following hypothesis:

(5) The ability of childhood personality to predict trajectories of aggressiveness and shyness in emerging adulthood is mediated by differences in demographic transitions.

**Method**

**Participants**

Participants were part of the Munich Longitudinal Study on the Genesis of Individual Competencies (LOGIC). The LOGIC sample originally consisted of 230 children (119 boys, 111 girls) who were studied every year from their first or second year in preschool until age 12. The sample was rather unbiased because the schools were selected from a broad spectrum of neighborhoods, more than 90% of the parents who were asked for permission gave their consent for their child's participation, and attrition until age 12 was low (19% over 9 years)

and unsystematic (see Weinert & Schneider, 1999, for this initial part of the study). After age 12, the LOGIC sample was reassessed twice, at ages 17 and 23. Attrition between ages 12 to 17 was again low (6% over 5 years), but higher between ages 17 to 23 (14%), resulting in 153 participants at age 23. The sample of the present study consisted of the 141 participants who were classified at ages 4 to 6 as resilient, overcontrolled, or undercontrolled on the basis of teacher Q-sorts. Of these 141 participants, 103 were assessed up to age 23.

**Assessments and Measures**

The present study refers to the following assessments: Teacher Q-sorts at ages 4, 5 and 6; parental ratings of shyness and aggressiveness at ages 4 to 23 (9 assessments). Because the assessments at ages 4 - 12 are described in detail by Asendorpf and van Aken (1999), only the most important information for these assessments and a more detailed description of the later assessments is provided here.

**Teacher RUO types**. The 54-item short version of the California Child Q-Set (CCQ; J. H. Block & Block, 1980) was adapted to German (Göttert & Asendorpf, 1989). All LOGIC participants attended a preschool, or kindergarten, from age 4 through 6. At the end of each school year, the child's main teacher provided a Q-sort description of the child according to a fixed, 9-point distribution, ranging from "extremely uncharacteristic" to "extremely characteristic". The teacher was instructed to sort exactly 6 items into each of the 9 categories (forced equal distribution).

The three Q-sorts at ages 4 to 6 were averaged itemwise and subjected to a Q-factor analysis. This method requires the data matrix to be inverted before being factor analyzed so that each child becomes a "variable" and each Q-sort item a "case". Three factors explaining 59% of the variance emerged, which were interpreted as Q-sort prototypes of resilient, overcontrolled, and undercontrolled children. Prototypical items of the three factors include "self-reliant, confident", "disorganized under stress" (negative loading) for resiliency;

"obedient and compliant", "self-assertive" (negative loading) for overcontrol; and "expresses

negative feelings directly", "inhibited and constricted" (negative loading) for undercontrol.

Children were then classified according to their factor loadings on these factors (which are

identical to the Q-correlation between their average Q-sort and the factor) according to a

procedure developed by Robins et al. (1996) (also see Asendorpf & van Aken, 1999). In

essence, they were classified as resilient/overcontrolled/undercontrolled if their average Q-

sort was more similar to one prototype than to the other two prototypes. As demonstrated by

Asendorpf and van Aken (1999), the distribution of the Q-factor loadings has both

dimensional and categorical features, with resiliency being a moderator variable for the

discreteness of the under- vs. overcontrol distinction. Ten of the 151 children with nonmissing

Q-sorts at ages 4 to 6 could not be classified unambiguously and were therefore excluded

from analysis. Of the remaining 141 Q-typed children, 48.9% were classified as resilients,

20.6% as overcontrollers, and 30.5% as undercontrollers.[1]

**Parental scales**. The main caregiver (nearly always the mother) answered a

questionnaire at ages 4, 5, 6, 7, 8, 10, and 12 that contained always a Shyness and an

Aggressiveness Scale, and at age 12 additional scales for the Big Five factors of personality.

At ages 17 and 23, both the mother and the father of the participants were asked to provide

independent judgments of the Big Five, Shyness, and Aggressiveness.

The Aggressiveness Scale consisted of 4 items, and the Shyness Scale consisted of 8

items at ages 4 to 10, and 4 items at ages 12 to 23. The items referred to aggressiveness with

peers (is aggressive to peers, starts arguing with peers, easily flies into a rage, makes peers

angry), and to shyness and inhibition with strangers (shy, inhibited, slow to warm up, uneasy

approach; see Asendorpf & van Aken, 1999, for details). In Asendorpf and van Aken (1999),

as in some other reports on the LOGIC study, the Shyness Scale was labeled "Inhibition

Scale" because it was related to behavioral inhibition to strangers in childhood. Here we

prefer the label "Shyness" because this is the more common term for adolescence and adulthood. The items of the two scales were randomly mixed with other items and answered on a 7-point response scale (with labels ranging from 1=*never* to 7=*always*).[2] The average reliability across waves was .84 for aggressiveness (range .75-.88) and .90 for shyness (range .83-.95). The minimum and maximum values of the aggressiveness and shyness scales were very similar across assessments, with an average of 1.16 (range 1.00-1.55) and 5.66 (range 4.00-7.00), respectively. At ages 17 and 23, mothers and fathers showed a moderate to high agreement for both Shyness and Agressiveness at both ages (*r*s ranged from .49 to .70).

**Life History Calendar**. To capture demographic transitions in a retrospective yet accurate way, the Life History Calendar (LHC) was used (Caspi et al., 1996b). This instrument, which was adapted to use in the current study, was implemented in an interview setting that lasted about 45 minutes. During this interview, various aspects of the participants' lives since the previous assessment (i.e., between age 18 and 23) were documented using a month-by-month horizontal timeline. For example, the start and end dates of every residential change was marked on the time line representing participants' living situation, the start and end dates of work contracts on the line indicating their working situation, etc. By proceeding serially from one life domain to another, interviewer and interviewee worked together to "anchor" additional life history information to key biographical events (e.g., "Did you get your new job before or after you broke up with your girlfriend?"), which has been shown to lead to more accurate responding (Caspi et al., 1996b).

In the current study, a version of the LHC was used that covered the following life domains (the order was fixed by an interviewer protocol): Living situation, romantic relationships, childbirth, education, and work. This information was used to create variables tapping into the latency of the assumption of three social roles that are important in the process of becoming an independent adult: moving out of the parental house, establishing a

romantic relationship, and getting a part-time job. These latency variables indicated the number of years (after becoming 18) until the occurrence of the transition in question (when participants had already made a transition before their 18$^{th}$ birthday, the corresponding latency variable was set at zero). The means of these variables were 3.04 ($SD$ =1.68, Range=0.00-5.67), 0.99 ($SD$ =1.33, Range 0.00-4.00), and 2.41 ($SD$=2.04, Range 0.00-5.92), for moving out of the parental house, establishing a romantic relationship, and starting to work part-time, respectively. Because only 4 participants of the current sample had become parents, constructing a parenthood variable did not make sense. In addition, it did not make sense to code the latency or duration of either education or full-time work, as in Germany, these aspects of the life span are extremely regulated according to one's chosen educational track (e.g., going to university or not), making them ill suited to study the effects of voluntary transitions.

## Results

### Attrition in the Main Variables

Attrition was studied for the present sample of 141 children by comparing the 38 drop-outs with the 103 children that participated in the study until age 23. Inspection of the proportion of the RUO types indicated that drop-outs tended to be less often resilient than the remaining children, whereas the proportion of overcontrollers and undercontrollers among the non-resilients was not affected by drop-out. Specifically, whereas 55% of the longitudinal participants was classified as resilient, the same was true for only 33% of the dropouts, which was significant, $\chi^2$($N$=141, $df$ = 1) = 5.25, $p$ < .03. In addition, attrition for the parental Shyness and Aggressiveness Scales was studied by comparing the drop-outs with the remaining children with regard to their aggregated scores across ages 4 to 6. No attrition effects were found. Thus, the only attrition effect was found with regard to childhood

resiliency, which could have lead to an underestimation of differences between resilient and

non-resilient participants.

**Prediction of Individual Trajectories from the RUO Types**

As in the earlier report by Asendorpf and van Aken (1999), developmental changes in

raw Aggressiveness and Shyness scores were studied with hierarchical linear modeling

(HLM; Raudenbush & Bryk, 2002), which differentiates between multiple levels of the data.

In the present case, the single measurement points were treated as the (lower-order) Level-1

information (e.g., aggressiveness at age 4). [3] These measurements are nested within

individuals who contribute the (higher-order) Level-2 information (e.g., the individual's RUO

type). For the many assessments of Aggressiveness and Shyness, both linear and quadratic

trends over participants' age were studied. To avoid collinearity between the linear and

quadratic trends, and to minimize correlations between level and slope of individual scores,

time was centered at the midpoint of the observation interval, age 13. This implies that the

model's intercept refers to age 13..

Differences between the RUO types were analyzed with two dummy variables that

contrasted overcontrollers and undercontrollers with the remaining resilient participants (a

third possible dummy variable that contrasts resilients with both over- and undercontrollers

was statistically redundant with the other two dummy variables). In addition, gender was

entered as a covariate by means of a dummy variable (0 = male, 1 = female). All dummy

variables were entered uncentered such that the intercepts in the HLM analyses refer to mean

effects for male resilients.

A persistent problem in longitudinal research is attrition; in the current study, the

original sample of 230 children was reduced to 153 children at age 23. This especially poses a

danger to unselected samples such as used in the present study, since "untypical" participants

(e.g., minorities, people from disadvantaged neighborhoods) may be more likely to drop out at

some point. If such participants are excluded from all analyses because of incomplete data, this truncates the initial heterogeneity of the sample. We used growth curve modeling within a hierarchical linear modeling approach to overcome this obstacle to some extent. To take advantage of all available data, for each individual in a core subsample of 141 children who were Q-typed in early childhood, individual means and slopes for linear and quadratic developmental changes in the main outcome variables of shyness and aggressiveness were estimated.

HLM is sensitive to the quality of the data, in that individuals with a larger number of data points and less error variation contribute more to the estimation of the overall regression equation (Raudenbush & Bryk, 2002). For Aggressiveness and Shyness, an average of 5.8 assessments could be used for 130 participants; for the Big Five, an average of 2.1 assessments could be used for 130 participants.[4] Because only 9 out of the 43 undercontrollers were girls, and only 11 out of the 29 overcontrollers were boys, and these figures were further reduced by missing assessments, we did not study sex by type interactions. The means of the RUO types in Aggressiveness and Shyness at ages 4 to 23 are presented in Figure 1.

**Aggressiveness**. As can be seen in Figure 1, Aggressiveness shows an extremely small initial difference between the RUO types at age 4. As pointed out by Asendorpf and van Aken (1999), this may be due to an invalidity of the initial parental Aggressiveness judgments that were obtained at a time when the children had just started preschool and their aggressiveness from the parents' perspective might have been largely determined by problems with leaving home for preschool. Later, undercontrollers were judged as highly, and overcontrollers were perceived as increasingly aggressive, starting off at low scores at age 6, reaching resilients' level of aggressiveness around age 12, and increasing further, particularly between ages 17 and 23 (accelerated increase).

This pattern was confirmed by the HLM analyses (see Table 1). A model including quadratic trends and gender (as a covariate) indicated that male undercontrollers were judged by their parents as significantly more aggressive than resilients (i.e., their intercept was an average of 0.799 points higher on the 7-point Aggressiveness Scale). The overcontrollers' overall Aggressiveness intercept did not significantly differ from those of the resilient participants. Finally, results indicated that girls were judged as significantly less aggressive than boys (i.e., their intercept was an average of 0.262 lower).

The analyses of linear and quadratic trends indicated a significant mean decrease in the parental judgments of Aggressiveness for resilients. The corresponding decrease rate was .067 points/year on the 7-point scale (the linear trend was computed by a regression of Aggressiveness on age which was centered at age 13 such that age 4 was coded as -9 and age 23 as +10, and the coefficients for trends are unstandardized regression coefficients; see Raudenbush & Bryk, 2002). Thus, over the 19-year period, resilient male participants can be predicted to be judged on average as 1.273 points less aggressive at age 23 than at age 4. There was a significant influence of gender on the linear change component, such that girls decreased 0.028 points/year *less* than boys. An additional significant positive mean quadratic trend indicated that this overall decrease was particularly strong in the beginning but less strong or even reversed into an increase toward the end. Indeed, Figure 1 indicates an increase rather than a decrease of the Aggressiveness scores between ages 17 and 23.

Turning to differences between the types, the analyses (controlling for gender) confirmed both a linear and a quadratic trend in Aggressiveness for overcontrolled participants. That is, overcontrollers were judged as increasingly aggressive by their parents relative to the resilient participants, particularly after age 17. Table 1 indicates that the male overcontrollers' Aggressiveness scores decreased 0.030 points/year *less* than the Aggressiveness scores of resilients, amounting to a total of 0.570 points over the 19-year

period. In addition, overcontrollers' Aggressiveness scores showed an even stronger positive quadratic trend than the resilient participants. Inspection of Figure 1 reveals that this was mainly due to the particularly strong increase in the overcontrollers' Aggressiveness between ages 17 and 23.

The unexpected above-average increase in Aggressiveness for overcontrollers was found for both mother and father ratings (Figure 1 is based on mother ratings except for three cases where the father but not the mother provided ratings; according to fathers only, the overcontrollers' Aggressiveness increased from 1.9 at age 17 to 3.1 at age 23, whereas it increased only from 2.1 to 2.6 for the remaining participants). In sum, the expected higher overall Aggressiveness of undercontrollers was confirmed, but in addition, an unexpected shift from the below-average Aggressiveness levels of overcontrollers at ages 5 to 10 into above-average Aggressiveness levels at the most recent assessment period was found.

**Shyness**. The figure for Shyness suggests an overall decrease in the parental judgments of Shyness. A model including quadratic trends did not show any significant quadratic effects. Therefore, a model without quadratic trends was run. As Table 1 indicates, a significant mean linear decrease of 0.087 points/year was found for male resilients (as participant gender predicted neither the intercept nor the linear increase in Shyness, this pattern also applies to female resilients). Thus, over the 19-year period, these participants can be expected to be judged on average as 1.653 points less shy at age 23 than they were at age 4. Furthermore, the overcontrollers were judged as 0.553 points more shy overall than the remaining participants. Whereas the resilients were judged by their parents as decreasingly shy, this decrease was less steep for undercontrollers (the difference was 0.060 points/year, amounting to a total of 1.140 points between ages 4 and 23).

All in all, the expected overall higher Shyness of overcontrollers was confirmed, but in addition, an unexpected shift of the initially below-average Shyness levels of the

undercontrollers into above-average Shyness levels was found. It should be noted that this pattern is an exact mirror image of the pattern for Aggressiveness (exchanging overcontrollers with undercontrollers, and Shyness with Aggressiveness).

**Prediction of Demographic Transitions from the RUO Types**

To see whether the timing of leaving the parental home, establishing a romantic relationships, and finding a part-time job in emerging adulthood was associated with childhood personality types, multivariate ANOVAs using the three latency variables as the dependent and childhood type membership, gender, and their interaction as the independent variable were carried out. Multivariate tests suggested a significant effect of sex, $p < .00$, and at least a marginally significant effect of RUO type, $F$s $> .04$, $ps \leq .06$. In addition, one test (Roy's Largest Root) also indicated a significant interaction effect between gender and RUO type, $F(3, 93) = 2.67$, $p = .05$, which is consistent with previous research that the demographic correlates of personality differ between the sexes (Caspi et al., 1987, 1988; Kerr, Lambert, & Bem, 1996). Because of this, the univariate analyses of the effect of the RUO types on the timing of demographic transitions were ran separately for boys and girls (see Table 2).

**Leaving the parental home**. Regarding the latency of leaving the parental home, there was a marginally significant overall effect of type membership for males but not for females. Post-hoc contrasts revealed that this was due to resilient males leaving the parental house 1.01 years earlier than nonresilient males, a difference that is statistically significant, $t(46)= 2.20$, $p = .03$.

**First partnership**. Regarding the transition into the first partnership, effects of type membership were again limited to male participants. Post-hoc comparisons indicated that this was due to overcontrolled boys being on average 1.43 years slower than resilient or undercontrolled boys in finding a romantic partner, $t(48)= 2.57$, $p = .01$.

**Part-time work**. Finally, regarding the transition into part-time work, a significant effect was found for girls but not for boys, though the corresponding *F*-values were very similar. Post-hoc contrasts showed that this was due to resilient girls being on average 1.37 years earlier in finding part-time employment, a difference that is statistically significant, *t*(46)= 2.25, *p* < .05. In boys, the corresponding difference was 1.14 years, which is only slightly below the conventional significance level, *t*(48)= 1.92, *p* = .06.

Together, these findings confirm Hypothesis 3 that individuals characterized by a resilient personality in childhood start assuming adult responsibilities at a younger age than overcontrollers and undercontrollers.

**Association Between Personality Maturation and Demographic Transition**

To test the hypothesis that the adoption of "mature" social roles in emerging adulthood would be associated with decreases in aggressiveness and shyness, a series of multiple regression analyses was carried out. Specifically, these analyses predicted shyness and aggressiveness in emerging adulthood (age 23) controlling for the same variables assessed in adolescence (age 17) as a first block. For both aggressiveness and shyness, the first regression block indicating the longitudinal stability was statistically significant, explaining 23% and 32% of the variance, respectively, *p*s<.01. Accordingly, individual differences in both aggressiveness and shyness showed a substantial amount of continuity as participants made the transition from adolescence to emerging adulthood.

In a second series of regressions, we expanded the regression models described above with two additional blocks of predictors of changes in aggressiveness and shyness between age 17 and 23: gender (Block 2), and the latencies of the transitions into emerging adulthood (Block 3). Because the three latency variables were only weakly correlated (*r*s ranging between -.03 and .11, *p*s>.17), they were entered simultaneously. In the case of shyness, this latter block failed to contribute significantly to the prediction of age 23 values, $\Delta R^2 = .01$, *p* =

.74. In the case of aggressiveness, however, the timing of the demographic transitions (inserted as a block) explained no less than 11% of additional variance, $p = .03$. An inspection of univariate coefficients showed that this was almost entirely due to the significant influence of getting a part-time job, $\beta = .36$, $p < .01$, whereas establishing a romantic relationship or leaving the parental home were not significantly associated with changes in aggressiveness, $p$s>.80.

**Mediation of Predictive Validity of the RUO Types by Demographic Transitions in Emerging Adulthood**

A final set of analyses was carried out to test Hypothesis 5 that the ability of childhood personality to predict adult personality trajectories outcomes is at least partly mediated by differences in demographic transitions. This was done by following the four steps discussed by Baron and Kenny (1986) to establish mediation (because of power limitations, interactions of gender by personality could not be analyzed).

First, it needs to be established that childhood personality predicts changes in aggressiveness and/or shyness between age 17 and 23, controlling for gender. Results showed that this was the case for changes in aggressiveness, which was significantly predicted by childhood resilience (entered as a dummy variable contrasting resilients with non-resilients), $\beta = -.29$, $p = .01$. Changes in shyness, however, could not be predicted by childhood personality, $\beta = -.06$, $p = . 57$. Thus, a test of mediation was only further pursued for aggressiveness.

As a second step, Baron and Kenny (1986) require that the initial variable (childhood personality) is correlated with the mediator (demographic transitions). Replicating the correlational results with a regression approach (controlling for gender), having a resilient personality in childhood was significantly associated with a shorter latency of getting a part-time job, $\beta = -.30$, $p < .01$. In contrast, no significant associations were found for the other

demographic transitions, *p*s > .44. Thus, subsequent analyses concentrated on the mediating role of the transition into part-time work in explaining the association between childhood personality and changes in aggressiveness in emerging adulthood.

The third step of Baron and Kenny (1986) involves establishing that the mediator affects the outcome variable after controlling for the initial variable. In the current case, the transition into part-time work remained a significant predictor of changes in aggressiveness between ages 17 and 23, $\beta = .32$, $p < .01$, even after controlling for participants' resiliency and gender.

Finally, for an establishment of a full mediation effect, it needs to be demonstrated that the initial variable no longer predicts the outcome variable after controlling for the covariates and the mediator. In the current case, this final requirement was also met, as childhood personality was no longer associated with changes in aggressiveness after controlling for the transition into part-time work, $p = .17$.[5] The full-blown mediation model is depicted in Figure 2. Accordingly, Hypothesis 5 was confirmed in the case of aggressiveness.

## Discussion

This 19-year longitudinal study tested hypotheses on the predictive validity of three major preschool personality types. First of all, we explored differential long-term trajectories for the types in terms of three variables that are crucial to two fundamental styles of dealing with the outside world: moving away from it (shyness) and moving against it (aggressiveness). Second, we tested the hypothesis that childhood personality would predict the timing of three important transitions in emerging adulthood: leaving the parental house, establishing a romantic partnership, and getting a part-time job. Finally, we investigated whether the timing of these transitions predicts changes in aggressiveness and shyness in emerging adulthood and whether this mediates the effect of childhood personality on adult outcomes. All of the hypotheses were at least partly confirmed. In the following, findings for

each of the outcome variables are presented in more detail, followed by a discussion of their broader implications for developmental theory.

**Aggressiveness**

**Mean-level trends**. On average, the parental judgments of aggressiveness decreased over the observed time span. An additional positive quadratic trend indicated that this overall decrease was particularly strong in the beginning and became less strong or even reversed into an increase toward the end. Indeed, Figure 1 indicates a minimum of parent-rated aggressiveness at age 17, and an increase of aggressiveness for all three personality types between ages 17 and 23. Thus, there were two different overall trends: a decrease from age 4 to 17, and an increase from age 17 to age 23.

The decrease from age 4 to age 17 is inconsistent with the literature on the development of externalizing problems such as antisocial behavior, physical aggression, and delinquency. For these aggression-related behaviors, an increase rather than a decrease is found between childhood and adolescence, particularly for the "adolescence-onset" form of antisocial behavior (e.g., Loeber & Stouthamer-Loeber, 1998; Moffitt, 1993). However, the aggressiveness scale used in the present study did not include items referring to physical aggression, antisocial behavior, or delinquency; instead, items referred to aggressive behavior toward peers in general (including verbal aggression), and hot temper. The few longitudinal studies from childhood into adolescence that investigated these more benign forms of aggression reported a decrease in aggression for both teacher- and parent ratings (e.g., Tremblay, 2000). The perhaps strongest evidence comes from a Dutch multicohort longitudinal study that followed a large sample drawn from the general population from the ages 4 to 18 (Bongers, Koot, van der Ende, & Verhulst, 2003). Parental ratings of aggressive behavior as assessed by the CBCL (Achenbach, 1991) showed a linear decrease between ages 4 and 18, whereas CBCL delinquent behaviors increased from age 10 to 18.

**Effects of childhood personality**. Turning to differences between the personality types, the expected overall higher aggressiveness levels of undercontrollers, along with the absence of differential linear change for this type, indicated constant effects of being undercontrolled on parent-judged aggressive behavior (see Figure 1).

Apart from the generally higher aggressiveness scores in undercontrollers, the shape of their developmental trajectory was not different from the overall pattern of change as indicated by the absence of significant effects of the undercontrolled type on the linear and quadratic trends. In contrast, being overcontrolled moderated both the linear and the quadratic age trend of aggressiveness. A significant effect on the linear trend showed that overcontrollers' aggressiveness increased more than average, and an additional significant effect on the quadratic trend indicated that their increase was more marked at the end. Figure 1 suggests that this latter finding can be attributed to the above-average increase in aggressiveness between ages 17 and 23. This increase was so strong that overcontrollers' aggressiveness became virtually identical with undercontrollers' aggressiveness. Has a similar trend for overcontrollers been reported in the literature?

Concerning the transition from early adolescence into adulthood, J. Block (1971) separately Q-typed adult males and females. In their fourth decade of life, 14% of the males were classified as "vulnerable overcontrollers" who were mainly characterized by stable internalizing tendencies. In addition, the male overcontrollers were described as becoming increasingly hostile between early adolescence and adulthood such that they were judged as adults as being more "basically hostile, self-defensive" (p. 162) than their other agemates. These findings are consistent with the present study as far as sex-atypical overcontrollers are concerned (boys are underrepresented among overcontrollers). As a note of caution, however, it should be added that J. Block identified his Q-types for adults that were considerably older than the participants of the present study at the last assessment.

In the Dunedin Longitudinal Study, the inhibited children, identified by observers at age 3, reported less aggression in the Multidimensional Personality Questionnaire (MPQ; Tellegen, 1982) at age 18 than the well-adjusted group (Caspi & Silva, 1995), and they were not more often diagnosed as having DSM-III antisocial personality disorder than the well-adjusted group at age 21 (Caspi, Moffitt, Newman, & Silva, 1996a). However, at age 21, the formerly inhibited children reported more interpersonal conflict at home (mostly their new residence after having left their family of origin; Newman, Caspi, Moffitt, & Silva, 1997), and they were more often convicted for a violent offense than their well-adjusted counterparts (Caspi et al., 1996a).

**Shyness**

**Mean-level trends**. The parental judgments of shyness decreased on average; no effects for quadratic trends were found. At a first glance, this decrease is inconsistent with the findings of the study by Bongers et al. (2003) who found an increase in internalizing problems, particularly in withdrawn behavior, between ages 4 and 18. However, shyness was assessed with items that referred to shyness with unfamiliar people. As numerous studies of the second author have shown, shyness with strangers, or inhibition to strangers, should not be confused with unsociability, that is, disinterest in others (e.g., Asendorpf, 1989). Withdrawn behavior can be due to shyness (Asendorpf, 1991) but also to unsociability (Asendorpf & Meier, 1993). Therefore, trends for withdrawn behavior may be different from trends for shyness with strangers. It is at least plausible to assume that over the years, children acquire more effective coping strategies for dealing with strangers (Asendorpf, 1991, 1994).

**Effects of childhood personality.** Concerning differences between the personality types, for overcontrollers there was an overall higher shyness scores, along with the absence of differential linear change. Thus, apart from the generally higher shyness scores, the shape of the developmental trajectory for overcontrollers was not statistically different from the

overall pattern of change. In contrast, undercontrollers' shyness increased over time compared to the resilient and overcontrolled participants (see Figure 1). This pattern can be interpreted in at least two ways.

First of all, it may be that the three RUO types converged in their shyness levels because of regression to the mean. Seen in this light, the decreasing levels of shyness of the overcontrolled participants between ages 4 and 23 may indicate that the effect of childhood personality on childhood shyness gradually faded out, making the overcontrolled individuals increasingly similar to their undercontrolled and resilient peers. For example, in stable social contexts, overcontrolled children may become habituated to their (self-selected) peer group so that they no longer behave shy in the presence of familiar others. Indeed, a series of ANOVAs indicates that childhood types only predict levels of shyness until age 17, after which the effect drops below conventional levels of significance, $F(2, 79)=1.53, p = .22$.

A second possibility is that the increase in shyness of undercontrollers represents a substantive trend. Support for this position again comes from the study by J. Block (1971) and the Dunedin Longitudinal Study. Regarding the former, J. Block (1971) classified 13% of his female adults in the fourth decade of their life as "vulnerable under-controllers" who were mainly characterized by stable externalizing tendencies. In addition, they were described as increasingly anxious between early adolescence and adulthood such that they were described as adults as "gives up and withdraws where possible in the face of frustration, uncomfortable with uncertainty, basically anxious" (p. 232). Again, these findings are consistent with the present study as far as sex-atypical undercontrollers are concerned (girls are underrepresented among undercontrollers).

In the Dunedin Longitudinal Study, the undercontrolled children, identified by observers at age 3, were at age 21 slightly more often diagnosed as having DSM-III anxiety symptoms than both the formerly well-adjusted children and the overcontrollers (Caspi et al.,

1996a). Together, these findings provide some evidence that undercontrollers not only tend to "move against" the world but increasingly begin to "move away" from it as well.

**Demographic Transitions in Emerging Adulthood**

As stated previously, the most recent wave of the current study tracked participants as they were making the transition from adolescence to emerging adulthood (Arnett, 2000). This "demographically dense" (Rindfuss, 1991) part of the life span is characterized by a gradual assumption of adult roles. As there exists no fixed timing for these transitions, this period offers a unique window of opportunity for individual differences in life course biographies that may alter the trajectory of personality development. In the current study, three important transitions were studied: leaving the parental house, establishing a romantic partnership, and getting a part-time job. These transitions are all indicative of assuming adult responsibilities, which according to Roberts et al. (2005) may explain the observed normative patterns of personality maturation in this age period (Neyer & Asendorpf, 2001; Robins et al., 2001; Srivastava et al., 2003).

In the current study, childhood personality types were significantly and meaningfully associated with the timing of all three demographic transitions. First of all, resilient males were found to leave the parental house approximately one year earlier than their overcontrolled and undercontrolled counterparts. Although the timing of leaving the parental home has been discussed as an important transition into adulthood (Graber & Dubas, 1996), we know of no previous study that has looked at personality correlates. Possibly, resilient males have superior social skills that enable them to leave the house earlier, though it is unclear why this does not apply to women. Second, overcontrolled boys but not girls were found to be more than one year slower in finding a romantic partner. This finding is consistent with earlier studies demonstrating that shy men but not women marry later than their more outgoing counterparts, both in the US and in Sweden (Caspi et al., 1988; Kerr et al., 1996).

Apparently, the traditional expectation that men initiate romantic contacts is difficult to fulfill for overcontrolled individuals. Finally, it was found that resilient boys and girls were faster in getting a part-time job than their overcontrolled and undercontrolled peers. Again, this pattern resembles previous findings pointing to different occupational trajectories for overcontrolled and undercontrolled boys in the US (Caspi et al., 1987, 1988), though not in Sweden (Kerr et al., 1996).

Following Roberts et al. (2005), it was hypothesized that the assumption of adult roles between age 17 and 23 would be associated with decreases in shyness and aggressiveness. In the case of changes in aggressiveness, this prediction was borne out, with the transition into part-time work explaining no less than 15% of the variance in residual scores. Thus, participants who started to work earlier became less aggressive over time, compared to their peers who postponed this transition. This finding is consistent with a number of previous findings indicating the importance of work experiences for personality change (Costa, Herbst, McCrae, & Siegler, 2000; Helson & Soto, 2005; Roberts et al., 2003). Although these studies focused on full-time work, Mortimer and Staff (2004) demonstrated that part-time work in adolescence is associated with resilience and psychological well-being in early adulthood, in part because it prepares young people for stressful occupations in adulthood. Also, part-time work may offer an early opportunity to test out different occupational identities and gain (partial) financial independence, which are both essential features of emerging adulthood (Arnett, 2000). The finding that the transition to part-time work only affected aggressiveness but not shyness may be explained by the fact that successful functioning in the domain of work is very much incompatible with behaving in an hostile but not necessarily a shy manner (e.g., many clerical occupations do not require much social contact).

Given the high societal costs of aggression and violence (Krug, Mercy, Dahlberg, & Zwi, 2002), it is interesting to speculate about policy implications of the current results. The

finding that participation in part-time work is associated with reductions in aggressiveness offers some interesting suggestions with regards to the prevention of violence in young adults and adolescents. For example, O'Donnell and colleagues (1999) describe a violence prevention program for adolescents including a component requiring students to provide services in local health care agencies. In a controlled, large-scale evaluation study, they found that, when provided with sufficient intensity, this intervention was successful in reducing students' level of violence. This is consistent with Roberts and colleagues' (2005) notion that assuming responsibility in taking up social roles is associated with personality maturation. The current study also suggests that the effects of work interventions may differ according to participants' personality makeup, however. Knowledge about the moderating role of personality on the effects of (part-time) work on aggressiveness could be used to identify individuals who are especially vulnerable to the deleterious effects of forced labor marker exclusion. Naturally, however, more research is needed before this principle can be applied to real-world psychological interventions.

In contrast to the significant result found for the latency of getting a (part-time) job, no mediation effects were found for the transitions into finding a romantic relationship and leaving the parental home. This lack of effects may be explained by the choice of both predictor and outcome variables. Regarding the former, it may be that the establishment of the first romantic relationship in emerging adulthood is not a powerful predictor, as it also includes relatively uncommitted short-term partnerships. Accordingly, different results may be found for more serious commitments such as engagement or marriage (e.g., Sampson & Laub, 1993). Similarly, it may be that more consequential changes in housing situation (e.g., buying a house) produce more substantial effects than merely leaving the parental home. On the outcome side, it is of course possible that establishing a romantic partnership and leaving the parental home impacts variables other than the ones we focused on in the current article.

For example, Neyer and Asendorpf (2001) have found that the transition into partnership is associated with decreases in self-reported neuroticism, which was not tested in the current study.

It should be pointed out that the present findings about the beneficial effect of part-time work are likely limited to certain socio-cultural contexts. Social Investment Theory predicts that assuming normative social roles is beneficial to personality maturation, but the meaning of what constitutes "normative" should depend on the particular culture and historical period that is studied. For example, in Germany, engaging in part-time work is thought to be a voluntary decision of young people by which they can gain a sense of financial independence, whereas in less affluent countries, any additional income is often shared with the entire family. Indeed, it has been pointed out that the existence of emerging adulthood as a phase in which young people can experiment freely and at their own pace with adult roles may be limited to affluent industrial countries (Arnett, 2002). The present findings may not generalize to countries in which the timing of certain transitions into adulthood depends more on outside pressures than on psychological characteristics of the individual. Finally, the direction of the press towards more socially desirable behavior ("personality maturation") may (at least partly) depend on the socio-cultural context that was studied. Although violence is generally frowned upon by mainstream western culture, certain subcultures (e.g., urban gangs) and cultures (e.g., the ancient Spartans) may tolerate or even encourage aggression as a legitimate way to reach goals.

**Part-Time Work Mediates Effect of Childhood Personality on Changes in Aggressiveness**

A final important result of the current study is that it could be shown that the effect of childhood resiliency on changes in aggressiveness between ages 17 and 23 is mediated by the timing of the transition into part-time work. This nicely dovetails with the central tenet of

dynamic interactionism that behavior is the result of complex transactions between persons and environments (Caspi, 1998; Snyder & Ickes, 1985). In the current case, this transaction takes the form of a proactive person-environment interaction (Caspi & Bem, 1990), as it is likely that resilient individuals actively selected an environment in which they could assume adult responsibilities at an early age. In turn, this form of "niche picking" (Scarr & McCartney, 1983) exposed them to favorable environmental experiences associated with part-time work (e.g., opportunities for role experimentation, stress inoculation, increased financial autonomy) that apparently prevented them from showing the increase in aggressiveness that was found for the overcontrolled and undercontrolled types.

The finding of a mediation effect explaining the effect of childhood resiliency on changes in aggressiveness is important for several reasons. First of all, it greatly reduces the likelihood that the observed decreases in aggressiveness for resilient individuals (relative to the other types) are based on chance, as the probability of falsely demonstrating even an incomplete mediation effect are only .0025 (i.e., the product of the .05 chance probabilities that two indirect paths are both significant). Second, the finding of the mediation effect makes an important contribution to the broader theoretical challenge of elucidating the *processes* by which personality variables affect long-term outcomes (Roberts & Pomerantz, 2004). Replicating the current finding and uncovering further mediators of the predictive validity of personality traits can help the emerging field of developmental personality psychology move from mere description to an explanation of the way in which personality and contextual variables affect individuals' longitudinal trajectories.

**Limitations**

The sample size of the present study was sufficient to detect moderate effects of differences between the Q-types but was not large enough to study effects of within-type differences, particularly regarding sex (e.g., in the case of the mediation analyses) The use of

hierarchical linear modeling made it possible to retain individuals with less than the maximum number of data points (at a minimum, only one assessment per individual is needed to estimate the mean; only two assessments are needed to estimate linear trends). Although the average number of assessments for the main dependent variables was high relative to other studies from early childhood into adulthood, systematic attrition of the sample limits the findings of the present study. The attrition rate of 30% between ages 4 and 23 was substantial, and attrition was systematic for resilience because both over- and undercontrollers were overrepresented among the drop-outs. This systematic attrition limited the differences between resilients and the two nonresilient types, and therefore the predictive power of the types. Fortunately, the drop-out rates for over- and undercontrollers were virtually identical such that comparisons between over- and undercontrol were not affected by attrition.

The moderate to high correlations between mothers' and fathers' judgments of their children's personality and the consistency between the findings for different scales with non-overlapping items support the validity of the parental scales as measures of the parental view of participants' personality. Parents likely base their personality judgments primarily on direct observation and secondarily on information provided to them by their children's peers, teachers, and superiors at the workplace. However, parents may have had only limited access to information about their children's aggressiveness and shyness outside of their family, particularly in peer interactions. Because the present study did not include peer judgments, the findings may be valid only for parents' view of their developing children.

Finally, like any other longitudinal study, no definite conclusions about causality can be drawn. That is, it may be that the effect of childhood personality on the timing of demographic transitions is due to some hidden third variable. Likewise, the fact that part-time work *statistically* mediated the effect of childhood resiliency on changes in aggressiveness does not prove causation. However, because it is very difficult if not impossible to

experimentally assign individuals to certain demographic transitions (e.g., by offering them a part-time job), our prediction is that studies of so-called "natural experiments" will continue to be useful in elucidating the effects of life experiences on personality development.

## Footnotes

[1] As this shows, both over- and undercontrollers are relatively rare. However, although they represent relatively problematic personality variants, they are not generally seen as pathological.

[2] At age 23, the items were answered in a 5-point agreement format rather than the original 7-point frequency format because they were mixed with NEO-FFI items of this agreement format. To make the raw scores for shyness and aggressiveness at age 23 comparable with the earlier assessments, we adjusted the individual scale scores to a 7-point format as follows. Sixty psychology students (mean age 23 years) answered the items (randomly mixed with distracter items) in both response formats (the order of the format was balanced within this sample). The differences between the means and the proportions of the standard deviations of the response formats obtained in this sample were then used for a linear adjustment of the age 23 shyness and aggressiveness scores to the original 7-point frequency format. It should be noted that this transformation did not change the interindividual differences at age 23 and thus did not affect differences between the personality types in shyness or aggressiveness.

[3] We used version 5.6.4 of HLM (Raudenbush, Bryk, & Congdon, 2001).

[4] It could be that selective attrition of participants with unstable trajectories biased the results in favor of greater stability. To test this possibility, all analyses were repeated with an additional dummy variable indicating attrition by age 23 as well as an index of the within-person standard deviation across time. Results showed that participants with more variable shyness or aggressiveness values had higher intercepts, $p < .02$. In addition, participants who had dropped out by age 23 on average had a higher aggressiveness intercept, $p = .01$. In contrast, these parameters were not significantly related to the (linear or quadratic) growth parameters and did not attenuate the results found for childhood personality.

[5] These results were replicated with a Sobel test, which supported the existence of a mediation

effect, $z = 2.09$, $p = .04$.

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**Tables**

Table 1

*Results of HLM Analyses for Aggressiveness and Shyness*

| Effect | Aggressiveness | | | | Shyness | | | |
|---|---|---|---|---|---|---|---|---|
| | *β* | *SE* | *t(127)* | *p* | *β* | *SE* | *t(127)* | *p* |
| *Mean at age 13* | | | | | | | | |
| -Intercept | 2.399 | 0.107 | 22.498 | .000 | 2.767 | 0.119 | 23.256 | .000 |
| -Overcontrol | -0.082 | 0.143 | -0.574 | .566 | 0.553 | 0.172 | 3.224 | .002 |
| -Undercontrol | 0.799 | 0.165 | 4.833 | .000 | -0.020 | 0.151 | -0.131 | .897 |
| -Gender (female) | -0.262 | 0.125 | -2.102 | .037 | 0.094 | 0.134 | 0.702 | .484 |
| *Linear change* | | | | | | | | |
| -Intercept | -0.067 | 0.010 | -6.970 | .000 | -0.087 | 0.013 | -6.737 | .000 |
| -Overcontrol | 0.030 | 0.011 | 2.685 | .009 | -0.009 | 0.018 | -0.512 | .609 |
| -Undercontrol | 0.024 | 0.016 | 1.464 | .146 | 0.060 | 0.016 | 3.852 | .000 |
| -Gender (female) | 0.028 | 0.012 | 2.327 | .022 | 0.007 | 0.015 | 0.495 | .621 |
| *Quadratic change* | | | | | | | | |
| -Intercept | 0.001 | 0.001 | 0.495 | .620 | | | | |
| -Overcontrol | 0.004 | 0.002 | 2.192 | .029 | | | | |
| -Undercontrol | -0.005 | 0.002 | -2.136 | .033 | | | | |
| -Gender (female) | 0.000 | 0.002 | -0.064 | .950 | | | | |

*Note*. *N*=130. Overcontrol, undercontrol, and gender were dummy-coded (1 for type/female, 0

for non-type/male) that were entered uncentered. Accordingly, intercepts refer to male

resilients. The standard errors *SE* and significance tests are based on robust standard errors.

For shyness, no quadratic trends were found; therefore the presented results refer to a model

without quadratic slopes.

Table 2

*Means, Standard-Deviations, and F-Values of ANOVAs Comparing the RUO Types in Terms*

*of the Timing of Demographic Transitions in Emerging Adulthood.*

|  |  | Men | | | Women | | |
|---|---|---|---|---|---|---|---|
|  |  | *M* | *SD* | *F* | *M* | *SD* | *F* |
| Latency to leaving family | RES | 2.59 | 1.66 | 2.86+ | 2.97 | 1.83 | 0.55 |
|  | OCO | 4.11 | 1.35 |  | 2.51 | 1.90 |  |
|  | UCO | 3.43 | 1.68 |  | 2.20 | 1.68 |  |
| Latency to first partnership | RES | 1.14 | 1.49 | 3.43* | 0.58 | 1.04 | 0.32 |
|  | OCO | 2.45 | 1.95 |  | 0.35 | 0.56 |  |
|  | UCO | 0.89 | 0.94 |  | 0.38 | 0.53 |  |
| Latency to part-time work | RES | 1.93 | 1.90 | 2.01 | 2.21 | 1.90 | 2.66+ |
|  | OCO | 2.65 | 2.22 |  | 3.38 | 2.27 |  |
|  | UCO | 3.22 | 2.28 |  | 4.02 | 2.11 |  |

*Note*. RES = resilients, OCO = overcontrolled, UCO = undercontrolled. The latency variables

are indicated in years past since participants' 18th birthday. Total N = 98 (males: 23 resilients,

7 overcontrollers, 20 undercontrollers; females: 32 resilients, 11 overcontrollers, 5

undercontrollers).

* p < .05, + p < .10

**Figure captions**

*Figure* 1. Developmental trajectories of aggressiveness and shyness for preschool personality types.

*Figure* 2**.** Latency of part-time work mediates the influence of childhood resiliency on changes in aggressiveness between ages 17 and 23 (the coefficient of the unmediated path between childhood resiliency and changes in aggressiveness is displayed in parentheses). ** p < .01.
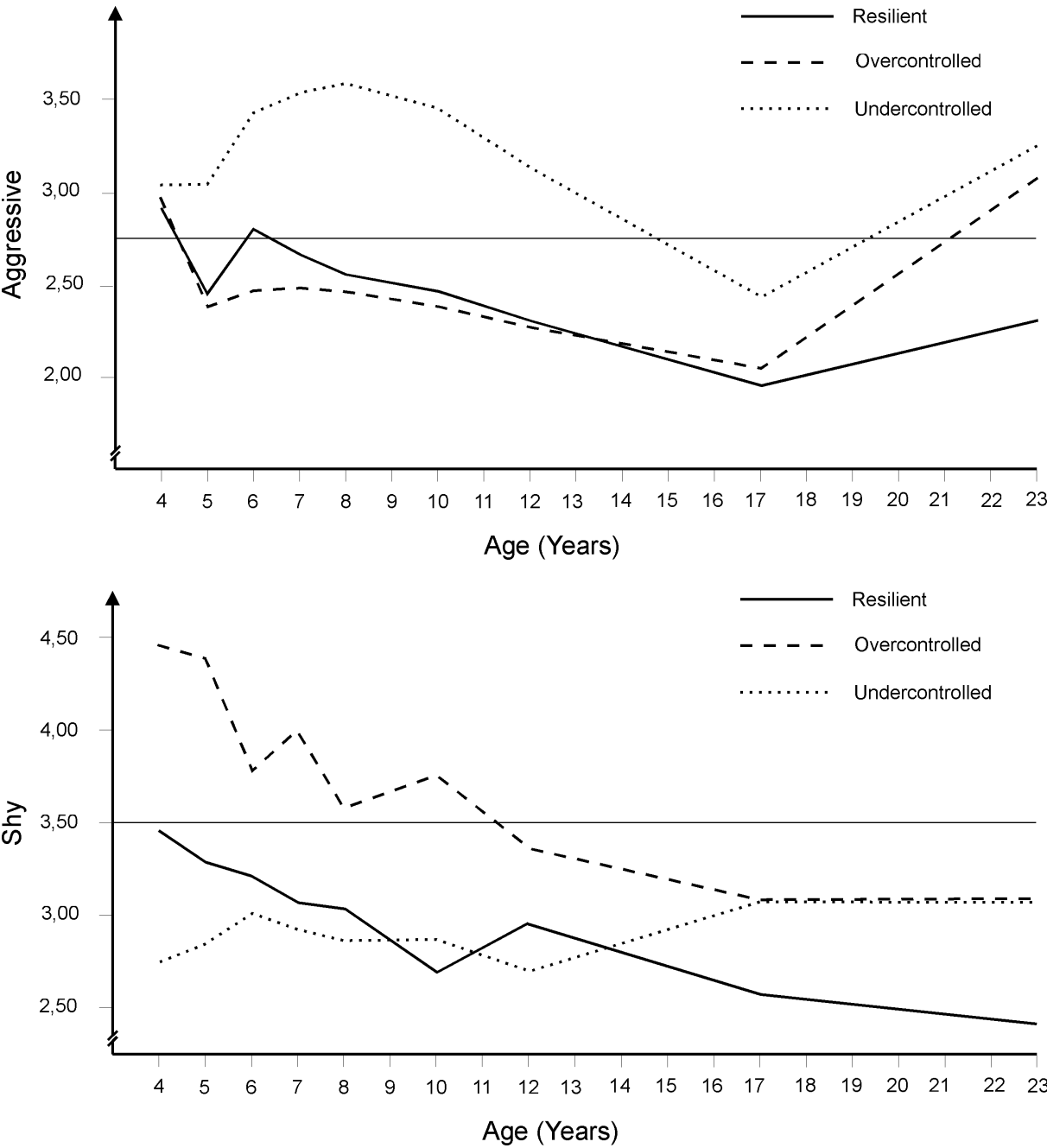
Fig.1

Fig. 2