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## Rules of intra-individual development in adolescence: A framework

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### ABSTRACT

Four longitudinal models are used to present a short review of research into adolescent psychosocial development. This review reveals adolescent development to proceed in a regular manner. This process of regular development suggests that it might be possible to uncover rules of intra-individual development. The aim of this paper is to propose a framework of such rules. The framework starts from three propositions of life-span psychology: (1) development has a direction; (2) development is multidirectional; (3) there is plasticity: within-person variability in development. The first proposition leads to the distinction between normative endpoints and transient states. The second proposition unfolds in the distinction between equifinality and multifinality and the notions of developmental neighbourhood effects, developmental continua and frequency of change. The third proposition shows changes in the prevalence of normative endpoints. Application of the framework to research into adolescent psychosocial development shows it to be useful to describe intra-individual development in a systematic manner.

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Longitudinal research into adolescent psychosocial development has progressed considerably in the last two decades. At this moment it is possible to review the field and to discover patterns of development in adolescence (Meeus, 2016). The present paper ties to this observation and tries to take the field one step further. I use four longitudinal models to present a short review of research and utilize this review to propose a framework of rules of intra-individual development in adolescence. The framework builds from a number of theoretical propositions of life-span developmental psychology suggested by Baltes (1987) and concerns

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the description of adolescent psychosocial development at the intra-individual level. The framework focuses on adolescent development but could also be useful to developmental psychologists studying other periods of life.

I proceed in four steps. First, I present four models to describe adolescent psychosocial development. Second, I review research done with these models and conclude that adolescent development proceeds in a quite systematic and regular manner. Third, I propose that this process of regular development offers the possibility to design a theoretical model of rules of adolescent development. The rules were inspired by propositions by Baltes (1987) on life-span developmental psychology. Fourth, I demonstrate that the model of rules can fruitfully be used to understand the findings of a series of 5 longitudinal studies.

### **Adolescent psychosocial development: Four descriptive models**

There are multiple ways to describe adolescent development. I introduce four commonly used approaches, 2 variable-centred and 2 person-centred. I use various approaches to characterize adolescent psychosocial development. In my description, I rely on two reviews I published recently (Meeus, 2016, 2019a).

I use two criteria to distinguish between four longitudinal models to describe adolescent development. (1) Do they offer description of a whole group (sample) or do they address heterogeneity of development: do they distinguish between different sub groups with different developmental trajectories? (2) Are they variable-centred or person-centred? Variable-centred approaches show development for a single variable, whereas person-centred approaches as a rule are used to describe configurations of variables within individuals, so-called individual types, and show the development of these types. Although the four approaches can be used to study long term development (months, but most often years) and short term development (hours within days, or between days) I will only present long term developmental data.

*Mean-level change.* Mean-level change models index the extent to which a whole sample shows an increase or decrease in certain traits or characteristics over time. So, in general, they are variable-centred. An example is that adolescents become less impulsive between the ages of 12 and 24 (Harden & Tucker-Drob, 2011). Theoretically, mean-level change

models indicate the extent to which development has a direction. In general, adolescents become less impulsive when they age.

*Rank-order stability.* Rank-order stability models describe the extent to which the relative position of individuals within a group becomes more or less stable over time. The measure of rank-order stability is variable-centred. Its statistic is the auto-correlation: the correlation between two measures of the same variable across time. An example is that individual differences in impulse control, the tendency to control impulses becomes more stable during adolescence. In early adolescence rank-order stability was .40 and in late adolescence .77 (Meeus & Becht, 2020). This indicates that the relative high or low position in impulse control of adolescents is more stable in late than early adolescence. Theoretically, rank-order stability indicates the extent to which individuals have a relatively stable adaptive or less adaptive position in their group of peers. The high rank-order stability in late adolescence indicates that there is a group of adolescents who will systematically restrain from risk in various situations as well as a group that is risk prone.

*Profile stability* indicates the within person stability of the rank-order of traits or characteristics. Profile stability is a person-centred index of the formal organization of an individual profile. Profile stability is calculated with Q-correlations that range from  $-1$  to  $1$ . An example is that the profile stability of identity in boys increases between early-to-middle and middle-and-late adolescence (Klimstra et al., 2010), indicating for instance, that late adolescent boys are more stable in the way they experience their identity. Some will have stable identity doubts across time, whereas other will have stable commitments without doubt. Theoretically, profile stability therefore is an index of the formal organization of traits within individuals. Although heterogeneity of profile stability can be easily modelled, in most studies this has not been done.

*Developmental trajectory chains (DTC).* This approach systematically addresses heterogeneity of development and applies latent Markov chain models to estimate trajectory chains, that is, trajectories in which individuals can belong to different discrete positions at every time point of the study (Kaplan, 2008). I illustrate the model with a hypothetical example on alcohol and substance use. The approach is person-centred since it starts with the identification of various types of substance and alcohol use: for instance, a type with very high substance use in middle adolescence and a type with moderate use. Development is then modelled by estimating the increase or decrease in the prevalence of both types across time. In general, one would expect an increase in the

moderate substance use type and a decrease in the very high use type from middle to late adolescence (Peeters et al., 2019). And finally, the approach would 'explain' the decrease in the high substance use and the increase in moderate use type by the transitions that individuals make from one type to the other type across time. In this example, the increase in the moderate substance use type would be due to the fact that the very high use type more often changes into the moderate substance use type than the other way around. Theoretically, DTC models are the person-centred equivalent of mean-level change models. They also reveal the direction of development, in the example the increase in the moderate substance use type. In contradistinction to profile stability models, DTC models do offer individual configurations of scores, types, with a content that can be characterized as adaptive or non-adaptive. The example on substance use makes this clear. Profile stability is content-neutral: the index of the formal organization of traits within individuals. Content-neutral means here that a profile stability of, for instance, .90 can be observed in two individuals with a total different ranking of traits: in a person with a ranking of Extraversion (E), agreeableness (A), Conscientiousness (C), Emotional Stability (ES) and Openness (O), but also in a person with a ranking of C, ES, E, O and A. This shows that the strength of the profile stability is an index of how systematic the ranking of traits with individuals is independent of the actual ranking of them.

### **What do the four models tell us about adolescent psychosocial development?**

Research into adolescent psychosocial development includes the study of the self, personal relationships and social cognition, and psychopathology. Longitudinal studies into the self include identity, personality and self-concept clarity; studies into personal relationships encompass parent-adolescent relationships including parenting, and peer relationships; studies into psychopathology include the various forms of internalizing and externalizing problems. For each of these subjects, I aim to demonstrate that they show a pattern of regular development.

#### ***The self***

Studies using the four longitudinal models reveal systematic patterns of normative development of identity and personality. Mean-level change models in general show growth of personality traits from early or middle

adolescence to late adolescence (Denissen et al., 2013; Klimstra et al., 2009; Roberts et al., 2006) and increase or stabilization of identity commitments (Meeus, 2011) along with the decrease in identity uncertainty in adolescence (Klimstra et al., 2010).

Similarly, studies systematically show increasing rank-order stability of personality traits (Klimstra et al., 2009; Roberts & DelVecchio, 2000; Van Dijk et al., 2020) and self-concept clarity (Crocetti et al., 2016). So, at the group level personality grows, identity certainty and strength increase, and the increasing rank-order stability shows that the relative position of adolescents within the group of peers becomes more fixed. This means that in the population of adolescents a group comes into existence with a strong personality and identity across time whereas another group emerges with a less adaptive personality and identity across time.

Person-centred studies, in general, also show systematic patterns of growth. As noted above, Klimstra et al. (2010) found an increase in profile stability of identity dimensions in boys. Similarly, Klimstra et al. (2009) and Van Dijk et al. (2020) found an increase in profile stability of personality traits across adolescence and early adulthood. Longitudinal DTC studies into identity and personality found similar patterns. Meeus et al. (2010) found that adolescents grow out of the non-adaptive identity status diffusion and moratorium into the adaptive status closure and achievement. This means that adolescents grow out of unorganized identity, diffusion, or an insecure identity, moratorium, into identity statuses with firm commitments. Also, Meeus et al. (2011) found adolescents to move out of undercontrolling and overcontrolling personality into resilient personality. So undercontrollers moved from the incapacity to control their impulses to the capacity to sometimes restrain and sometimes act. Similarly, overcontrollers moved from always being restrained to the capacity to choose between restraint and action. In sum, these findings show that adolescents with a more disorganized or insecure identity or a less adaptive personality grow into a more secure identity and more adaptive personality.

The results on the growth of profile stability of identity and personality and rank-order stability of personality traits and self-concept clarity concur nicely. The increase in profile stability indicates that the formal organization of adolescent personality grows within individuals. The increase in rank-order stability suggests the same phenomenon at the group level, in that the relative position of adolescents within the group of peers becomes more stable.

The findings of the DTC studies concur with those of the mean-level change models. The developmental trajectory chain models show that adolescents grow out of diffusion and moratorium and into closure and achievement, and move out of undercontrol and overcontrol into resilient personality. This means that they reveal the maturation of identity and personality at the individual level. The mean-level growth of personality traits and decrease in identity uncertainty shows the same at the group level.

Taken together, the findings of the four models demonstrate normative development that can be qualified as maturation of the self in adolescence.

### *Personal relationships*

First I present findings on mean-level change and rank-order stability. Second I discuss a couple of studies using developmental trajectory chains.

Mean-level change studies typically report parent-adolescent relationships to become more symmetrical in adolescence. For instance, De Goede et al. (2009b) found support from parents to decrease during early-to-middle adolescence, and to increase again in middle-to-late adolescence, conflict with mothers and fathers to peak in middle adolescence and decrease thereafter, and maternal and paternal power to decrease linearly. Van Doorn et al. (2011) report problem solving in adolescent-parent conflict to increase in early and middle adolescence and Keijsers et al. (2009) parental behavioural control to decrease in early and middle adolescence. Studies also found growing adolescent individuation in information management in adolescence. Keijsers et al. (2009) found adolescent disclosure to parents to decrease. Research into rank-order stability of parent-adolescent relationships is limited, but Meeus (2019b) found systematic increases of rank-order stability of support from parents, conflict with parents and power of parents from early to late adolescence. The increase was quite substantial: from about .50 in early adolescence to about .75 in late adolescence.

As far as I know, only one DTC study into the development of parent-adolescent relationships has been conducted. Hadiwijaya et al. (2017) reported substantial developmental increases and decreases of three key parent-adolescent relationship types across adolescence. The turbulent and conflictuous type increased in early-to-middle adolescence and decreased in middle-to-late adolescence, whereas the harmonious type stayed stable in early-to-middle adolescence and increased in middle-to-late adolescence. The authoritative type decreased in early-to-middle adolescence and stayed

stable in middle-to-late adolescence, but with a lower prevalence than in early-to-middle adolescence.

Taken together these findings suggest that supportive, conflictual and parent-dominated relationships in the first half of adolescence change into supportive, more harmonious, and egalitarian relationships at the end of adolescence. These results were found at the group and individual level.

As for friendships, mean-level change studies reveal adolescents' relationships with best friends to become more supportive during adolescence. De Goede et al. (2009a) report support from best friends to systematically increase between ages 12 and 19, and both conflict with best friends and dominance by best friends to peak in middle adolescence. Similarly, Yu et al. (2014a) found an increase in problem solving in conflicts with best friends in early-to-middle adolescence. Thus, support in friendships increased and adolescents learn to solve problems in conflicts when they age. However, conflicts and power and compliance issues are present in best friendships in middle adolescence. The DTC study by Hadiwijaya et al. (2019) into parent and friend relationships showed that the friendship type became the most prevalent one in middle-to-late adolescence. This study also demonstrated that the parent-oriented type became less prevalent and replicated earlier findings of Hadiwijaya et al. (2017): turbulent relationships with parents and friends peak in middle adolescence, whereas harmonious relationships become more prevalent across adolescence. So, in general, adolescent friendships tend to become more close and egalitarian during adolescence and also become more important as compared to parents.

### *Adolescent psychopathology*

I present findings on mean-level change, rank-order stability and developmental trajectory chains, separately for internalizing (anxiety, depression) and externalizing problems (delinquency, direct aggression and substance use).

Mean-level change studies show mixed findings on the development of internalizing problems. Nelemans et al. (2014) found school anxiety and separation anxiety to decrease during adolescence, panic disorder to decrease with a small rebound at the end of adolescence, social anxiety to peak in middle adolescence, and generalized anxiety to increase from middle to late adolescence. Van Delden et al. (2017) reported a decrease in depressive symptoms between the ages 13 and 14, followed by a systematic increase between the ages of 14 and 20. Again, research



into rank-order stability of anxiety and depression is limited, but Meeus (2019b) found systematic increases of rank-order stability of social and generalized anxiety and depression from early till late adolescence. Also, here the increase was quite substantial: from about .40 in early adolescence to about .70 in late adolescence. Together these findings show that especially generalized anxiety and depression increase in adolescence. Also, individual differences in anxiety and depression become more fixed.

Mean-level change studies into the development of externalizing problems also show mixed findings. Meeus et al. (2004) found the age-crime curve of delinquency: a substantial increase from early to middle adolescence and a systematic decrease thereafter. Meeus (2019b) reported a systematic decrease in direct aggression across adolescence, whereas Van Delden et al. (2017) reported a systematic increase in substance use. Meeus (2019b) found rank-order stability of delinquency to increase from .40 in early adolescence to .70 in middle and late adolescence. So here we have a differentiated pattern: delinquency (from middle adolescence on) and direct aggression decrease but substance use increases. Individual differences in delinquency become more fixed when adolescents age.

Only one DTC study into adolescent psychopathology has been conducted, in this case into the co-occurrence of direct aggression and generalized anxiety. Meeus et al. (2016) found the direct aggression type (DA, high on aggression) to decrease across adolescence, whereas prevalence of the generalized anxiety type (GAD, high on generalized anxiety) and the No problem type (low on both aggression and anxiety) increased. These findings are consistent with the results of the mean-level change study by Nelemans et al. (2014) on generalized anxiety and those of Meeus (2019b) on direct aggression. Also, at the individual level, I observe an increase in generalized anxiety and a decrease in direct aggression.

Taken together these findings indicate, both at the group and individual level, that adolescents grow out of externalizing problems except for substance use. On the other hand, depression and generalized anxiety are on the rise.

I draw a general conclusion. I observe adolescent maturation of the self and personal relationships. Adolescents also tend to grow out of externalizing problems. Exceptions are the increase in substance use till emerging adulthood and the increase in depression and generalized anxiety till late adolescence. Also, individual differences become more stable during adolescence. This is a key finding since it implies that late adolescents have lower chances to escape a relative disadvantaged position than early

adolescents. To clarify this with an example I use again the finding that the rank-order stability of impulse control is .40 in early adolescence whereas is .77 in late adolescence. This indicates that early adolescents with low impulse control have a better chance to increase in impulse control and achieve a relatively better position in the population of adolescents. In late adolescence, this relative improvement of position is more difficult since most adolescents have already a fixed level of impulse control.

I note that the findings discussed above come mainly from Dutch studies. The majority of them, however, have been replicated in studies from various countries (Meeus, 2016). For example, growth of personality traits was found in a meta-analysis that included data from the US, Finland, Germany, the Netherlands, and Norway (Roberts et al., 2006). Similarly, changes in parent-adolescent relationships and parenting were found in a series of longitudinal studies in the US (see, for instance, Hafen & Laursen, 2009), Belgium (see, for instance, Vansteenkiste et al., 2014) and Sweden (see, for instance, Kerr et al., 2010).

### Rules of intra-individual development: a framework

The findings reported above suggest that adolescent development proceeds in a quite regular and systematic manner. This offers the possibility to start designing a general theoretical framework of adolescent development. Of course, many theoretical developmental frameworks exist, but most of the time they apply to one developmental domain, such as moral development, ego development or identity development. The framework I will propose is a general one, applicable to multiple developmental domains. To do so I will use the seminal paper of Baltes (1987) on principles of life-span developmental psychology. But first I offer a number of more general comments on developmental processes. (1) Although development has a direction, we should avoid teleological interpretations. There is no fixed endpoint of development for every individual. Instead, heterogeneity or multidirectionality of development is the rule. (2) At this moment we observe the emergence of a discussion of development within and between persons. A general observation here is that our theories in most cases describe processes on the individual level and our statistical models test these processes at the between-person level (Berry & Willoughby, 2017; Hamaker et al., 2015; Keijsers et al., 2016). So there is a disjunct between the level of analysis of our

theories and our statistical models. The debate leads me to conclude that we need to focus on individual development both in theory and method. But without neglecting heterogeneity of development. To understand individual development we always will need the range of development to gauge the various developmental possibilities and to understand whether the development of a particular individual is adaptive or non-adaptive. (3) The within-person and between-person discussion applies both to the description of development as to the study of developmental covariation, the interplay of multiple developmental processes. The framework I will suggest addresses the description of development.

### *From principles of life-span developmental psychology to rules*

Three propositions of Baltes (1987) are very useful for the study of adolescent development. (1) Development has a direction: for most developmental processes we observe a general trend. This proposition is not explicitly mentioned by Baltes but he touches upon it when discussing Havighurst's notion of developmental tasks (Baltes, 1987, p. 614). (2) Development is multidirectional: general trends can show increases and decreases in various forms of psychological functioning at the same time. (3) Plasticity: there's within-person variability in development. Depending on changes in life-conditions individuals may show changing developmental trajectories.

Application of these three propositions to the empirical study of intra-individual adolescent development requires refinement of two of them. Baltes proposition on direction will be translated into the distinction between normative endpoints and transient states. Baltes proposition on multidirectionality will be expanded into equifinality, multifinality, developmental neighbourhood effects, developmental continua and frequency of change.

### *Direction: normative endpoints of development and transient states*

This refinement combines the notions of direction and heterogeneity of development. If there is direction of development, this should show in two ways: there should be some developmental states that occur more often than others, and these developmental states should display high over time stability. This stability indicates that these states are normative endpoints of development. If there is heterogeneity of development we should see various normative endpoints of development, but possibly

also developmental states that are not normative: transient states with low over time stability. To illustrate the various concepts I use an example from the earlier cited study by Meeus et al. (2016) on direct aggression and anxiety. Meeus et al. found heterogeneity of development: a No problem type (Np: adolescents with low levels of direct aggression and anxiety) and a direct aggression type (DA: adolescents with very high levels of direct aggression). The Np type proved to be an endpoint of development since its prevalence rose and also since virtually no adolescent who belonged to it left the Np type: its four-year stability was .93, see Table 1. Therefore, I consider the Np type to be an endpoint of development. In contradistinction, the prevalence of the DA type decreased and its four-year stability was only .45, meaning that 55% of the adolescent left the type in a period of four years. Therefore, DA is a transient state.

*Multidirectionality: equifinality, multifinality, developmental neighbourhood effects, developmental continua and frequency of change.* Multidirectionality implies that development can take different directions. The notions of equifinality and multifinality were proposed by Cicchetti and Rogosch (2002) and refine the notion of multidirectionality. Equifinality means that a certain developmental state serves as the endpoint for various initial developmental states. Multifinality represents the other side of the coin and indicates that an initial developmental state can change into multiple developmental endpoints. Developmental neighbourhood effects were suggested by Meeus (2016) and refine the notion of multifinality by stating that initial developmental state A is more likely to change into developmental endpoint B than developmental endpoint C. For instance, Meeus et al. (2011) found that across four years 50% of the undercontrollers changed into resilient, whereas only 21% of the overcontrollers changed into resilient. This shows that undercontrol is a more close developmental neighbour of the resilient type than overcontrol.

The notion of developmental continua emerged in the theoretical debate on identity development (Marcia, 1967; Meeus, 2018; Waterman, 1982). In the present paper, a developmental continuum is conceptualized as a combination of developmental neighbourhood effects: can these effects be organized on a single continuum or multiple continua? Finally, the notion of the frequency of change indexes the dynamics of multifinality: do individuals often or less often switch between developmental states?

### *Loss of relative plasticity*

This is the opposite of plasticity and ties to the notion of normative endpoints. Of course, there's always within-person variability in development. However, I assume that this variability is dependent on drastic changes in life-conditions. When these changes are absent, moving into normative endpoints will be imperative for a substantial group of adolescents. And moving into normative endpoints implies loss of relative plasticity. In empirical terms, it would show in the increase in prevalence of normative endpoints.

### **Applying the rules to development in various domains**

I use results of five earlier discussed DTC studies to demonstrate the usefulness of the framework of rules of intra-individual development: studies on identity development (Meeus et al., 2010), personality development (Meeus et al., 2011), parent-adolescent relationships (Hadiwijaya et al., 2017), parent and friend relationships (Hadiwijaya et al., 2019) and generalized anxiety and direct aggression (Meeus et al., 2016), see Table 1.

### *Direction: normative endpoints of development and transient states*

Table 1 shows normative endpoints of development and transient states across developmental domains. The mean four-year stability of the normative endpoints ( $n = 9$ ) is considerably higher than that of transient states ( $n = 12$ ): .70 and .26, respectively. Consistent with the notion of heterogeneity I observe multiple endpoints in most developmental domains. It also shows that in most cases normative endpoints are adaptive developmental types: the identity status achievement and closure, the resilient personality type, the harmonious parent-adolescent relationship, the friend-oriented relationship, and the no problem type. Transient states, on the other hand, in most of the cases represent less adaptive types: the identity status diffusion and moratorium, the undercontrolling personality type, the turbulent and uninvolved-discordant parent-adolescent relationship, the turbulent parent and friend relationship and the direct and comorbid direct aggression types.

*Multidirectionality: equifinality, multifinality, developmental neighbourhood effects, and developmental continua.* Table 1 shows equifinal and multifinal states in all developmental domains. Remarkably, the equifinal states are

**Table 1.** Translating principles of Baltes (1987) into a framework of rules of intra-individual development.

Developmental domain	Direction of development			Multidirectionality		Loss of relative plasticity			
	Normative <sup>1</sup> endpoints	Stability <sup>2</sup> (inter-val in years)	Transient <sup>1</sup> states	Stability (inter-val in years)	Equi-final states		Multi-final states	Developmental neighbourhood effects (examples)	Single or multiple continua
Identity development	Closure (C) Achievement (A)	.80 (4) .62 (4)	Diffusion (D) Moralization (M) Searching moratorium (SM)	.39 (4) .39 (4) .18 (4)	C A SM	D M SM	D → C <sup>3</sup> > D → SM, M, A M, SM → A, C > M, SM → D C → A > C → D U → R > U → O, O → R	Multiple	Yes (C & A)
Personality development	Resilients (R) Overcontrollers (O)	.92 (4) .76 (4)	Undercontrollers (U)	.15 (4)	R	U		Close to single	Yes (R & O)
Development of parent-adolescent relationships <sup>3</sup>	Harmonious type H)	.78 (4)	Turbulent type (T) Uninvolved-discordant type (U-D) Authoritative type	.32 (4) .39 (4) .38 (4)	H U-D	T	A, U-D → H > A → U-D and A, U-D → T T → U-D, H > T → A	Multiple	Yes (H)
Development of relationships with parents and friends <sup>4</sup>	Harmonious (H) Friend-oriented (F)	.23 (4) .39 (4)	Turbulent (T) Average (A) Parent-oriented (P)	.18 (4) .14 (4) .19 (4)	F	H, F, T, A, P	Not tested	Multiple	Yes (H)
Development of generalized anxiety and direct aggression <sup>5</sup>	'No problems' type (Np) Anxious type (GAD)	.93 (4) .88 (4)	Direct aggression type (DA) Comorbid aggressive type (C-DA)	.45 (4) .00 (4)	Np	C-DA	DA, C-DA → Np > DA, C-DA → GAD C-DA → DA > C-DA → Np	Multiple	Yes (Np)

Notes. <sup>1</sup> Normative endpoints and transient states have been discussed in the paragraph 'Direction: normative endpoints of development and transient states'. The paragraph also provides examples of them. <sup>2</sup> A stability of .80 means that 80% of respondents stays in the same endpoint across time points. <sup>3</sup> D → C indicates development from D to C. <sup>4</sup> For reasons of presentation only rules of development of parent-adolescent relationships, parent and friend relationships in middle-to-late adolescence are discussed. <sup>5</sup> Also, rules of development of generalized anxiety and direct aggression are discussed for middle-to-late adolescence only.

almost exclusively (exception is the uninvolved-discordant type, U-D) normative endpoints of development whereas the multifinal states in most cases represent transient states. This means that equifinality indexes transitions from transient states into normative endpoints and therefore represents a mechanism of adaptive development. The developmental meaning of multifinality is less clear-cut: adolescent can transit from transient states to adaptive normative states and to less adaptive alternative transient states. I clarify this with a developmental neighbourhood effect in identity development: the  $M, SM \rightarrow A, C > M, SM \rightarrow D$  equation (column Developmental neighbourhood effects in [Table 1](#)) makes clear that the transition chances from M (moratorium) and SM (searching moratorium) to A (achievement) and C (closure) are bigger than those of M and SM to D (diffusion). But the equation also shows that individuals in M can move into both the adaptive identity status A (achievement) and the non-adaptive identity status D (diffusion).

[Table 1](#) shows developmental neighbourhood effects in all developmental domains where they were tested. These effects make clear that individual development is not a random process and that the initial state of an individual is predictive of a state later in adolescence. An example is the  $U \rightarrow R > U \rightarrow O, O \rightarrow R$  equation. In terms of four-year transition chances the equation reads as:  $.50 > .34, .21$ . So 50% of the undercontrollers (U) changes into resilient (R), whereas only 34% of the undercontrollers (U) changes into overcontrollers (O) and only 21% of the overcontrollers changes into resilient. This example again shows equifinality: both  $U \rightarrow R$  and  $O \rightarrow R$  are possible. In sum, developmental neighbourhood effects show development to be regular and often index the adaptive mechanism of equifinality. Next to developmental neighbourhood effects, [Table 1](#) demonstrates that they cannot be organized on a single developmental continuum. This means that identity development, personality development, development of adolescent relationships and development of generalized anxiety and direct aggression cannot be described as a stepwise progression or regression on a single continuum. Developmental processes in these domains cannot be framed as movements from developmental stage A to stage B, followed by a movement from B to C, from C to D, et cetera. [Table 1](#) does not present findings on frequency of change since only two studies (Meeus et al., 2010, 2011) included data on this issue thus far.

### Loss of relative plasticity

Finally, Table 1 shows developmental increases of the normative endpoints in all domains. Normative endpoints have a high over time stability and therefore index loss of relative plasticity.

### Conclusion

The principles of Baltes can be translated into a framework of rules of intra-individual development. By using the distinction between normative endpoints and transient states, the notions of equifinality, multifinality and developmental neighbourhood effects we can describe individual development in a systematic manner. Across all five studies of Table 1 we observed normative endpoints of development and transient states. We also observed equifinal and multifinal states and found out that the equifinal states were almost always normative endpoints of development. Developmental neighbourhood effects were found in all studies where they were tested. This makes clear that individual development is not a random process but that an initial state of an individual is predictive of a state later in adolescence. Available data until now also demonstrate that adolescent psychosocial development cannot be described on a single developmental continuum.

A limitation of the framework is that it can be only used to describe adolescent psychosocial development. So the extension of the framework to the study of covariation of multiple processes of intra-individual development is warranted. For example, how does personality development go together with the development of generalized anxiety at the individual level? This calls for associative DTC studies.

### Disclosure statement

No conflict of interest was reported by the author.

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