



Adaptive adjustment of vocational aspirations among German youths during the transition from school to work[☆]

Martin J. Tomasik^{a,*}, Sam Hardy^b, Claudia M. Haase^a, Jutta Heckhausen^c

^a Department of Developmental Psychology, Friedrich Schiller University, Am Steiger 3/1, 07743 Jena, Germany

^b Brigham Young University, Provo, UT, USA

^c School of Social Ecology, University of California at Irvine, CA, USA

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ABSTRACT

The transition from school to work is a central developmental task with long-term implications for the financial and social status of individuals. We argue that dynamic adjustments of aspirations play a decisive role for a successful outcome of the school to work transition, particularly in the context of the German vocational training system. Latent growth curve analyses conducted on the self-reported occupational aspirations of German adolescents ($N = 414$) surveyed in a 5-wave longitudinal study during their senior school year support this assumption. Based on expectancy-value-models of achievement, we delineated an adaptive trajectory of aspirations as starting off with relatively high aspirations and subsequently gradually downgrading them until s is attained. Such a trajectory of adjustment should maximize both expectancy (i.e., probability of obtaining an apprenticeship position at all) and value (i.e., training position with promotion potential). Finally, we showed empirically that the trajectory conceptually proposed as most adaptive was characteristic for youth who reported phase-adequate goal engagement strategies as suggested by the life-span theory of control.

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1. Introduction

For adolescents and young adults around the world, occupational choice and the transition from school to work constitute important developmental tasks with significant consequences for their future potential in financial, social, and psychological domains. However, as compared to only a few decades ago, the transition from school to work is now characterized by uncertainty and unpredictability that all require increased efforts in self-regulation for successfully finding one's way into the labor market. Furthermore, Blossfeld (1990) has demonstrated that German adolescents who do not start vocational training within two years of graduation from school are unlikely to ever receive vocational training. German adolescents thus face the challenge of competing for an apprenticeship that will have a strong impact on their future career and financial prospects in a situation of scarce supply and faced with an inescapable deadline for starting an apprenticeship (Heckhausen & Tomasik, 2002).

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* Corresponding author. Address: Friedrich-Schiller-Universität, Sonderforschungsbereich 580, Bachstrasse 18, 07737 Jena, Germany. Fax: +49 3641 945052.

E-mail address: martin.tomasik@uni-jena.de (M.J. Tomasik).

This article examined how German adolescents self-regulate the urgent goal striving in their transition from school to work under the condition of a strained labor market. Our theoretical approach to vocational choice is a life-span developmental one (Super, Savickas, & Super, 1996; Vondracek, Lerner, & Schulenberg, 1986) and draws on research suggesting that children and adolescents pass through different stages of vocational identity with an increasingly realistic orientation towards their occupational opportunities (Dickinson, 1990; Gottfredson, 1981, 1996). The degree of calibration needed is itself a function of the societal context in terms of social mobility and permeability of educational and career tracks. In the German vocational system, permeability is low (Hamilton, 1994) and thus close calibration of aspirations is most adaptive (Heckhausen & Tomasik, 2002). This process of consecutive circumscription and compromise is more and more guided by the social valuation of occupations and narrowed to options that match the socio-economic background and perceived academic ability of the adolescents and young adults. Given that, we suggest that occupational choice at the transition from school to work can be conceptualized in terms of an adaptation in the social prestige of aspired to occupations. Within a range of acceptable options, adolescents explore their occupational opportunities and make adjustments in terms of their aspired social prestige. This strategy should also be quite effective given the realities of labor markets since the social prestige of occupations is directly related to their accessibility. Heckhausen and Tomasik (2002) thus suggest that compromising in social prestige is “a basic process involved in vocational orientation during the transition to adulthood” (p. 215). The adaptiveness of such strategies is, of course, dependent on the societal context. In societal systems with great permeability and support for upward mobility, a close calibration of aspirations to one’s current status may be dysfunctional (Heckhausen, Chang, Chen, & Greenberger, 2008).

2. Propositions for an adaptive adjustment of aspirations

Given the theoretical importance of compromising in social prestige, one can ask about the best strategies for adjusting one’s aspirations. Before suggesting an answer to this question we need to review the parameters that adolescents at the transition from school to work need to optimize. Against the backdrop of expectancy-value-models we want to define the first one as the accessibility of an apprenticeship in a given occupation and the second one as its value in terms of social prestige. We expect that the probability of obtaining an apprenticeship position relates negatively to its social prestige. This proposition is derived from definitions of social prestige which emphasize that social prestige serves as a symbolic gratification and results from processes of exclusion and social inequity. For instance, if everyone could become a physician the social prestige of this occupation would certainly not be located at the upper end of the continuum.

To obtain an apprenticeship at all, which is very important given the developmental deadline (Blossfeld, 1990), students could go for apprenticeship positions low in social prestige. However, social prestige relates to factors relevant for adolescents’ future development. Higher social prestige correlates with higher income, lower risk of unemployment, more autonomy and self-determination at the workplace, and better prospects for promotion as well as better physical health and higher subjective well-being (Jencks, Perman, & Rainwater, 1988; Kohn & Schooler, 1983; Mirowsky & Ross, 2003). To profit from these benefits, adolescents should strive for a highly prestigious occupation. Obviously, adolescents are face two contradictory objectives – maximizing the attainment probability and the social prestige of an occupation. Optimizing these parameters simultaneously turns out to be a critical developmental task for the transition to adulthood. Adolescents should neither over- nor under-aspire but match their aspirations to their potential given the realities on the labor market (Heckhausen & Tomasik, 2002). Over-aspiration increases the risk of failure to obtain an apprenticeship position at all; under-aspiration fails to utilize one’s resources for securing vocational training with optimal potential for income and quality of work. Note that these assumptions closely relate to a research tradition in psychology that investigates achievement behavior under the paradigm of expectancy and value (Heckhausen & Heckhausen, 2008). This research tradition assumes a negative relationship between expectancy and value, and we suggest that this is also the case for the present subject of study.

How can this optimization between expectation and value be achieved in the time before school graduation given the urgency of a developmental deadline? Two parameters by which a trajectory of aspirations may be conveniently described can be considered: an initial level which is the starting point for the adjustment of aspirations and the direction or slope of adjustment. The best strategy to obtain any apprenticeship position at all would be starting lower and possibly downgrade in the course of time. This, however, can only be considered a strategy that maximizes just one of the two relevant parameters, namely the probability of obtaining a position. If our model holds, we should be able to demonstrate this relationship empirically. Adolescents could also persistently strive for one or more occupations without adjusting upwards or downwards. However, any kind of rigidity with regard to level of aspiration should be dysfunctional given that the labor market is not perfectly transparent, adolescents do not know their “best value” in advance, and the demand of the labor market is dynamic rather than stable. Hence, it is unlikely that adolescents would find the optimum between the probability of success and the objective of high prestige at their first attempt.

Consequently, two types of adjustment strategies are possible. One is to start with (somewhat) lower aspirations and upgrade them until a subjectively satisfying level is reached; the other is to start (somewhat) higher and downgrade aspirations until an apprenticeship position is attained. The strategy of starting low in aspirations and upgrading, however, has a distinct motivational disadvantage. Although it is likely to result in quick success, the very experience of success could tempt youth to abandon further goal striving prematurely. Since there is a definitive time limit, adolescents do not know whether they will be successful if they give up their attained position and look for a new one – irrespective of the size of improvement in

terms of social prestige. Thus, one may expect that adolescents starting low in prestige will, on the average, not attain their full potential but rather prematurely back out of upgrading. If this assumption is correct, the strategy of upgrading aspirations should be empirically very rare, because it is quickly abandoned. Thus, finally, from all the alternative options of aspirations adjustment discussed the strategy of starting with higher aspirations and downgrading turns out to be the best strategy that allows both attainment probability and high prestige to be optimized under the given conditions of a nontransparent labor market and a developmental deadline. So long as the pace of downgrading is sufficiently fast, this strategy will allow all adolescents to secure an apprenticeship position with the highest level of social prestige attainable under the respective conditions. After having introduced the hypothesized adaptive trajectory of aspirations at the transition from school to work, the question arises who will adjust aspirations adaptively and who will not. In the next section we will introduce control strategies as potential predictors for an adaptive adjustment of aspirations.

3. Primary and secondary control strategies

The transition from school to work in Germany involves an urgency that is typical of developmental deadlines (Heckhausen, 1999). In the context of the motivational theory of life-span development, Heckhausen and Schulz (1995) have differentiated between two kinds of control striving. On the one hand, there is *primary control* that is directed toward the environment; on the other hand there is inwardly directed *secondary control* related to an individual's motivational resources. The life-span theory of control views individuals as agents in their own development who are actively striving for and disengaging from developmental goals in age-graded synchronization with the waxing and waning opportunities across the life course. According to the life-span theory of control the most adaptive strategy is to make use of favorable opportunities by engaging with on-time goals and avoid goals for which opportunities have waned or are not yet available. The on-time period for the transition from school to work covers a relatively narrow time window around school graduation (Blossfeld, 1990; Heckhausen & Tomasik, 2002). Adolescents who have not yet successfully attained the transition from school to work before the opportunities wane should experience intensified urgency and therefore step up their engagement by investing more behavioral and motivational resources. Specifically, goal engagement should comprise the following control strategies: (1) *selective primary control* (SPC) or investing behavioral resources such as time, effort and skills into goal pursuit; (2) *compensatory primary control* (CPC) or recruiting help from others and using unusual means and detours to attain the goal; and (3) *selective secondary control* (SSC) or strategies that enhance one's volitional commitment to the goal. In contrast, goal disengagement that relies on *compensatory secondary control* (CSC) strategies should be avoided. Empirical findings show that on-time goal engagement is beneficial for attaining apprenticeship as well as for well-being after graduation, particularly for girls who are disadvantaged in the school to work transition (Haase, Heckhausen, & Köller, in press).

How do primary and secondary control strategies relate to the adaptive trajectory of aspirations? We hypothesize that adolescents who use phase-adequate control strategies for self-regulation, namely the goal engagement strategies of selective primary, compensatory primary, and selective secondary control, will more likely adjust their vocational aspirations in the way proposed to be adaptive. By showing this empirically we want to achieve two objectives. First, by analyzing motivational consequences of the control strategies in terms of level of aspiration and its adjustment we want to elucidate the processes that underlie broad constructs such as goal engagement or goal disengagement. Goal engagement is a complex psychological state that cannot be put on a level with simple concepts such as effort or persistence. On the contrary, goal engagement should be reflected in a careful deliberation of opportunities and constraints, and in an adequate adjustment of goals, aspirations, and the different control strategies to the respective conditions. Second, we want to identify theoretically meaningful predictors of an adaptive trajectory of aspiration adjustments. Research related to the level of aspirations paradigm considers either external factors such as success or failure in a task (e.g., Festinger, 1942) or rather stable personality characteristics (e.g., Gruen, 1945) for predicting shifts in level of aspirations. We want to bring individuals as the agents in development to the fore and demonstrate how their personal striving for control informs their level of aspirations.

4. Research questions

This study addressed three research questions. First, we investigated the validity of our assumptions by predicting the attainment of an apprenticeship position by the adjustment of vocational aspirations. Second, we predicted that youth who use more control strategies of goal engagement will be more likely to exhibit an adaptive trajectory of adjusting vocational aspirations. Third, we expected that all these findings should be robust after considering school achievement as a control variable which is highly associated with the level of vocational aspirations (e.g., Heckhausen & Tomasik, 2002).

4.1. Prediction of apprenticeship attainment

Before starting the analyses, we needed to make sure that the assumptions of our model of adaptive trajectories of adjustment hold. Specifically, we expected a relationship between the level of aspiration in terms of the social prestige and the probability of attaining an apprenticeship position. Lower social prestige of occupations aspired to should relate positively to obtaining an apprenticeship position. Also, a steeper downgrading in social prestige before graduation should predict a higher probability of attaining an apprenticeship position. Note that this research question does not yet address the issue

of optimization between the probability of success and a preferably high occupational prestige. We do *not* propose that starting lower and downgrading aspirations generally is an adaptive strategy.

4.2. Prediction of the adaptive trajectory of aspirations

In our theoretical considerations we proposed the strategy of high initial aspirations and a subsequent downgrading as the most adaptive strategy given the actual constraints of the transition from school to work. After having shown the relationship between social prestige and attainment probability we thus investigated predictors of this trajectory we defined adaptive. We hypothesized that control striving associated with goal engagement predicts a trajectory that starts with high aspirations and continues with a subsequent downgrading throughout the school year. Opportunity-incongruent control striving (i.e., goal disengagement), by contrast, should be associated with maladaptive trajectories such as rigid stability of aspirations.

4.3. Relevance of school achievement

Heckhausen and Tomasik (2002) defined the adjustment of vocational aspirations to school achievement as an indicator for developmental optimization because school grades are the decisive factor for German companies hiring apprentices (Eberhard, Krewerth, & Ulrich, 2005). A more accurate picture of the adjustment of aspirations may thus be obtained when considering school achievement as the standard against which the adjustment of social prestige takes place. If this is true and the propositions for an adaptive trajectory are universal, students with better grades should adjust their aspirations in the upper range of social prestige, students with lower school achievement in the lower range, and there should be no systematic difference in the trajectories as a function school achievement.

5. Method

5.1. Sample

Four high schools in the eastern and western part of Berlin, Germany, were identified to serve either lower or lower middle class residential areas. Three cohorts of students from these schools participated a longitudinal study spanning 9th and 10th grade as well as the subsequent years following graduation. For the present investigation we used data from the five measurement occasions during 10th grade. Information whether students have obtained an apprenticeship was collected in two follow-up measurement occasions about six and twelve months after graduation.

Overall, $N = 768$ students participated in the entire study. Attrition during senior year was low due to obligatory school attendance (see Heckhausen & Tomasik, 2002), but $N = 70$ students dropped out after grade 9 leaving a core sample of $N = 698$ students. Retention rates in grade 10, the focus of the present study, ranged between 78.6% and 90.5% per measurement occasion during the school year and 83.8% of the students participated in at least four of the five longitudinal measurements. Attrition after graduation was considerably higher (n retained = 464 or 66.5% of the core sample) and selectivity analyses indicated that students who did not participate the follow-up were rather male and on the average two months older. However, they did not differ on neither the education of their parents nor their own school achievement. Also, we did not find significant differences in their vocational aspirations. In this paper we were only interested in developmental trajectories of adolescents who at least once in the school year reported to head for an apprenticeship and who had follow-up data available. A small number of middle-tier students aspired to enter higher education after tenth grade in order to obtain three more years of schooling; we excluded these students ($n = 50$) from our analyses.

The final sample thus comprised $N = 414$ adolescents of which 51.9% were female. At their transition from school to work at the end of the senior school year adolescents were $M = 16.89$ ($SD = .61$) years old. On average their parents had attained a ten-year educational track ($M = 10.56$; $SD = 1.50$; valid $n = 384$). Most adolescents (90.8%; valid $n = 391$) had German citizenship.

5.2. Procedure

Prior to the study parental consent was obtained for all participants. Students filled out written questionnaires during regular classroom hours while teachers were absent. These sessions were led by trained personnel and lasted approximately 90 min. Participants received a small token after completing the questionnaire. After graduation, surveys were mailed to the participants who were compensated with 30 deutschmarks after they returned the questionnaire.

5.3. Measures

5.3.1. Vocational aspirations

At each wave students were asked to name up to eight occupations in which they were interested. These nominations were coded into social prestige scores using a prestige scale of apprenticeship occupations. The validity of this scale was demonstrated in previous research (Heckhausen & Tomasik, 2002; Tomasik, 2003) and in terms of concurrent validity with

other established prestige scales (Tomasik & Heckhausen, 2006). The average prestige of occupations named at each wave was calculated.

5.3.2. Calibration of aspirations and achievement

A variable was created at each wave to reflect individual differences in aspirations relative to level of academic achievement. School grades in mathematics, German, English, and history were assessed at the beginning, in the middle and at the end of the school year (i.e., the first, third, and fifth waves of data during senior year). Within each measurement occasion these grades were averaged for each subject (internal consistency was $\alpha = .72$, $\alpha = .75$, and $\alpha = .75$ for the three waves). A standardized variable for overall academic achievement was then calculated by taking the mean of the three waves of achievement data ($\alpha = .89$), and computing the z-score on that composite. To standardize aspirations, z-scores were calculated separately for each wave, but the distribution mean and standard deviation put into the formula were derived from all five waves combined. Calibration scores were then calculated by subtracting the standardized achievement scores from the standardized aspirations scores at each wave for each subject. Thus, positive scores on this calibration measure mean that an individual's vocational aspirations relative to the group were greater than their relative achievement, while negative scores indicate that his or her academic achievement relative to the group was greater than his or her relative aspirations.

5.3.3. Control strategies

Control strategies in the domains of apprenticeship seeking and profession finding were assessed using a German version of the Optimization in Primary and Secondary Control Scales (Heckhausen, Schulz, & Wrosch, 1998). The scales were adapted to the domain of apprenticeship seeking. The SPC ($.74 < \alpha < .81$; e.g., "I invest all my energy in getting a suitable apprenticeship position"), CPC ($.70 < \alpha < .77$; e.g., "I try to get support from other people if there are problems with apprenticeship seeking"), and SSC ($.64 < \alpha < .74$; e.g., "When I am thinking about my career I keep saying myself that I will surely be successful") subscales included four items each, while seven items tapped CSC ($.71 < \alpha < .79$; e.g., "If I have big trouble in finding an apprenticeship, I will think that occupation is not everything in life"). Responses ranged from 1 (almost never true) to 5 (almost always true). Scores were created at each occasion on each subscale by taking the mean of the relevant items.

5.3.4. Apprenticeship attainment

After graduation students indicated whether they had attained an apprenticeship position or not.

5.4. Analysis plan

The study hypotheses were examined using multi-group latent growth curve models (LGCM; Duncan, Duncan, Strycker, Li, & Alpert, 1999). In latent growth curve modeling observations at each occasion are used as indicators of level and slope latent variables or factors – level and slope being the two key attributes of the latent or unobserved individual growth trajectories. Similar to classical confirmatory factor analysis, in LGCM the factor loadings indicate the relative weighting of each observed variable on the latent factors. Given that the contribution of the level factor does not change over time (because it is the intercept), the factor loadings for the level are set to be equal across occasions (in the present study they were set to 1.0). On the other hand, the factor loadings for the slope factor indicate the shape of the curve. In the present study we fixed the first slope loading to 0 and the fifth to 1, and allowed those for the second, third and fourth wave to be freely estimated. This allowed the shape of the curve to emerge from the data and doing so provided a significant improvement in model fit over models with linear slope specified.

The statistical software package Mplus 4.0 (Muthén & Muthén, 1998–2006) was used to estimate the model parameters and to assess model fit. Model parameters were estimated using full information maximum likelihood (FIML), which capitalizes on available data, so all cases with data on at least one variable are included in the analysis. The chi-squared (χ^2) statistic, root mean squared error of approximation (RMSEA), and comparative fit index (CFI) were used as the key indicators of how well each model fit the data (Hu & Bentler, 1999). In multi-group analyses, these χ^2 -difference tests are used to compare the fit of models where certain parameters (e.g., level and slope means) are constrained to be equal across groups to other models where the same parameters are allowed to vary across groups. If the constrained model indicates better model fit than models where parameters are freed to vary across groups, this suggests that the parameters likely do not differ significantly across groups. On the other hand, an improvement in model fit found by freeing a parameter to vary across groups indicates that this parameter likely does differ significantly across groups.

The present study involved a series of multi-group LGCMs of data from the five waves of measurement during the final year of high school for German adolescents, where the grouping variable was whether the adolescents was successful in receiving an apprenticeship (SUCC) or not (FAIL). The following sequence of LGCMs was conducted:

First, a series of multi-group LGCMs was estimated for vocational aspirations across the five waves. In the initial model, all parameters were constrained to be equal across groups (SUCC and FAIL). In the subsequent models, the level and slope means were freed, and then the level and slope variances and covariances (as well as residual variances), and then the freely estimated slope coefficients (i.e., the basis coefficients).

Second, a series of multi-group LGCMs was estimated to assess the four control strategies as predictors of the level and slope factors for vocational aspirations. For each control strategy, a latent variable was created using the observed measures at each occasion as indicators. Further, the initial model for each control strategy was set such that the parameters for the

level and slope means and variances mirrored those of the best-fitting LGCM for vocational aspirations. Additionally, in these initial models the two regression coefficients for the control strategy predicting the level and slope means were constrained to be equal across groups. Then, for each control strategy, a second model was estimated with these two regression coefficients freed to vary across groups.

Third, a series of multi-group models analogous to those in the first two steps was conducted using the measure of calibration of vocational aspiration with academic achievement. In other words, multi-group models were first conducted to assess group differences in calibration level and slope means and variances, followed by models looking at control strategies as predictors of level and slope.

6. Results

6.1. Multi-group LGCMs of vocational aspirations

A series of multi-group LGCMs was calculated to test whether adolescents who received an apprenticeship (SUCC) differed from those who did not receive an apprenticeship (FAIL) in terms of the trajectories of their vocational aspirations across their final year of high school (see Table 1). First, a model was estimated with all the parameters constrained to be equal across groups. The second model, in which the level and slope means were freed, showed a significant improvement in model fit. To determine whether both the level and slope mean differed significantly across groups, two additional follow-up models were conducted – one freeing just the level mean and the other freeing just the slope mean. Both of these models showed significant improvements in model fit over the baseline model, suggesting that the two groups differed significantly on both level and slope mean. Specifically, those who received an apprenticeship showed lower initial vocational aspirations and a greater decline in aspirations across the senior year than those who failed to secure an apprenticeship. Third, freeing the variances and covariances did not lead to a significant improvement in model fit over the previous model. Similarly, freeing the slope basis coefficients in a fourth model did not significantly improve model fit. Thus, the best-fitting model was the second model tested, where the level and slope means were freed to vary across groups, but the variances, covariances and slope basis coefficients were constrained to be equal across groups. In this model, the slope coefficients were $\lambda_1 = 0$, $\lambda_2 = .46$, $\lambda_3 = .94$, $\lambda_4 = .96$, $\lambda_5 = 1.00$, with the first and last being fixed and the middle three freely estimated.

6.2. Multi-group LGCMs of vocational aspirations with control strategies as predictors

A series of multi-group LGCMs was estimated to assess the four control strategies as predictors of vocational aspirations level and slope (see upper part of Table 2). The model parameters were set inline with the best-fitting LGCM for vocational aspiration, which was allowing the level and slope means to vary across groups but constraining the variances and covariances to be equal across groups. Group differences in the role of control strategies in vocational aspiration trajectories were assessed by comparing the fit of an initial model where the regression coefficients of control strategies on level and slope were constrained to be equal across groups to a model where these coefficients were allowed to vary. None of the less-constrained models led to a significant improvement in model fit. Thus, the initial models – with all regression coefficients constrained across groups – were retained and will be presented here. Selective primary control was linked positively to aspirations level but negatively to slope, selective secondary was positively related to aspiration level, while the associations for compensatory secondary control was negative. Interestingly, compensatory primary control was not significantly related to level or slope.

6.3. Multi-group LGCMs of calibration

A series of multi-group LGCMs was estimated to examine whether adolescents who successfully attained an apprenticeship (SUCC) differed from those who did not (FAIL) depending on how they calibrated their vocational aspirations to their academic achievement (see Table 3). A baseline model was first estimated where all parameters were constrained to be equal across groups. The second model, where level and slope means were freed to vary across groups, fit significantly better than the baseline model. To determine whether the groups differed significantly in both level and slope, two follow-up models

Table 1
Multi-group latent growth curve model of vocational aspirations by apprenticeship success group.

Model	Level mean	Level variance	Slope mean	Slope variance	Level-slope covariance	Model fit
FAIL	53.89*	30.06	-.53	19.09*	-6.26*	$\chi^2(31) = 66.79$; CFI = .97; RMSEA = .08
SUCC	same	same	same	same	same	
FAIL	54.52*	29.74*	.10*	18.75*	-6.53*	$\chi^2(29) = 54.26$; CFI = .98; RMSEA = .06 $\Delta\chi^2(2) = 12.53$
SUCC	53.37*	same	-1.01*	same		
FAIL	55.24*	26.67*	.09*	17.99*	-6.93*	$\chi^2(25) = 52.81$; CFI = .98; RMSEA = .07 $\Delta\chi^2(4) = 5.24$
SUCC	53.38*	32.60	-1.03*	17.87	-5.26*	

* $p < .05$.

Table 2

Multi-group latent growth curve models of vocational aspiration with control strategies as predictors of level and slope.

Model	β_{Level}	β_{Slope}	Model fit
<i>Dependent variable: Vocation aspiration</i>			
SPC	1.67*	-1.67*	$\chi^2(106) = 165.95^*$; CFI = .97; RMSEA = .05
CPC	.54	-.58	$\chi^2(106) = 143.22^*$; CFI = .98; RMSEA = .04
SSC	1.72*	-1.00	$\chi^2(106) = 130.48$; CFI = .99; RMSEA = .03
CSC	-1.43*	.21	$\chi^2(106) = 149.90^*$; CFI = .98; RMSEA = .04
<i>Dependent variable: Calibration</i>			
SPC	-.17	-.27*	$\chi^2(106) = 168.29^*$; CFI = .98; RMSEA = .05
CPC	-.18	-.09	$\chi^2(106) = 158.86$; CFI = .98; RMSEA = .05
SSC	-.24	-.16	$\chi^2(106) = 130.45$; CFI = .99; RMSEA = .03
CSC	.38*	.04	$\chi^2(106) = 158.86^*$; CFI = .98; RMSEA = .05

Notes: $N = 414$ (SUCC: $n = 227$; FAIL: $n = 187$); SPC, selective primary control; CPC, compensatory primary control; SSC, selective secondary control; CSC, compensatory secondary control; In all models, regression paths from control strategies to the latent level and slope variables are constrained to be equal across apprenticeship groups; * $p < .05$.

Table 3

Multi-group latent growth curve model of calibration by apprenticeship success group.

Model	Level mean	Level variance	Slope mean	Slope variance	Level-slope covariance	Model fit
1 FAIL	.06	1.40*	-.08	.45*	-.18*	$\chi^2(31) = 68.09^*$; CFI = .98; RMSEA = .08
SUCC	same	same	same	same	same	
2 FAIL	.18	1.39*	.03	.45*	-.19*	$\chi^2(29) = 56.99$; CFI = .98; RMSEA = .07 $\Delta\chi^2(2) = 11.10^*$
SUCC	-.04	same	-.16*	same	same	
3 FAIL	.18	1.49*	.03	.48*	-.25*	$\chi^2(25) = 55.57$; CFI = .98; RMSEA = .08 $\Delta\chi^2(4) = 1.42$
SUCC	-.04	1.33*	-.16*	.42*	-.15	

Notes: Model 1: all constrained; Model 2: free means; Model 3: free variance and covariances; $N = 408$; SUCC: adolescents who succeeded getting an apprenticeship ($n = 226$); FAIL: adolescents who failed an apprenticeship ($n = 182$); * $p < .05$.

were tested, one freeing just the level mean and the other just the slope mean. Both of these models fit significantly better than the baseline model, suggesting that the groups differed on both level and slope means. Specifically, those who failed to receive an apprenticeship showed higher aspirations relative to their achievement than those who succeeded. Additionally, those who failed in getting an apprenticeship tended to relative overaspiration – while the same was not true for those who failed. Freeing the variances and covariances and freeing the slope basis coefficients did not significantly improve model fit. In this model, the slope coefficients were $\lambda_1 = 0$, $\lambda_2 = .40$, $\lambda_3 = .94$, $\lambda_4 = .96$, $\lambda_5 = 1.00$, with the first and last being fixed, and the middle three freely estimated. Hence, most of the change in calibration took place early in the last high school year, and then there was relative stability.

6.4. Multi-group LGCMs of calibration with control strategies as predictors

A series of multi-group LGCMs was estimated to assess whether the four control strategies were significant predictors of calibration level and slope (see lower part of Table 2). The growth model parameters were set according to the best-fitting LGCM for calibration, where the level and slope means were allowed to vary but the variances and covariances were constrained to be equal across groups. Group differences in the role of control strategies in vocational aspiration trajectories were tested by comparing the fit of a baseline model where the regression coefficients of control strategies on level and slope were constrained to be equal across groups to a model where these coefficients were allowed to vary. The less-constrained models did not lead to significant improvements in model fit. Thus, the initial models – with all parameters constrained across groups – were retained. In these models, selective primary control was a significant negative predictor of calibration slope, but not level meaning that those higher on selective primary control downgraded their relative aspirations more pronounced as compared to those lower on selective primary control. Additionally, compensatory secondary control related positively to level, meaning those higher on compensatory secondary control had the highest initial aspirations relative to their achievement. Compensatory primary control and selective secondary control did not significantly relate to level or slope.

7. Discussion

This article introduced a model that both describes the adjustment of aspirations and predicts them by theoretically relevant variables. The first research question examined the assumption that higher aspirations are associated with a lower accessibility of an apprenticeship position. Results pertaining to the first research question fully supported this assumption. The social prestige of apprenticeship occupations correlated negatively to their accessibility. The results showed that

students who attained an apprenticeship position within one year after graduation were more likely to have lower aspirations and to downgrade them in the course of the senior school year.

Another important result was that those who attained an apprenticeship position did not differ from those who did not in terms of the variances and covariances of the latent trajectory components as well as in terms of its shape. Hence, neither group had a broader scope of vocational aspirations nor adjusted their aspirations more pronounced. The only but theoretically crucial difference we found was in the initial level of aspirations and the direction of their adjustment. Basically the same results were obtained when controlling for school achievement by using the calibrated aspiration measures in the latent growth curve models. The accessibility of an apprenticeship position was thus predicted by the relative level of aspirations given school achievement. These findings support the validity of both our assumptions and the measures used.

However, securing an apprenticeship position is only one aspect of a successful transition from school to work. A successful transition was defined as the optimization between a high probability of obtaining an apprenticeship position (expectancy) and a relatively high attainment in terms of social prestige (value). After having demonstrated that maximizing the two parameters requires opposite adjustments so that a joint optimization of both requires a balance between ambition and caution, we then turned to the prediction of a trajectory of aspiration we defined as the most adaptive one.

We argued that among all possible trajectories of aspiration adaptation, starting relatively high and subsequently downgrading one's aspirations seems to be the most promising strategy. The results demonstrated that certain aspects of phase-adequate control striving associated with this adaptive trajectory of aspiration adjustments. Higher goal engagement in terms of selective primary control (e.g., "I invest all my energy in getting a suitable apprenticeship position") associated with both higher initial aspirations and a steeper downgrading which is necessary given the urgency of finding an apprenticeship. Students who used meta-volitional strategies represented by selective secondary control (e.g., "When I am thinking about my career I keep saying to myself that I will surely be successful") started off with higher levels of aspirations but there was no significant association with change of aspirations over time. Phase-inadequate control striving as indicated by compensatory secondary control (e.g., "If I have big trouble in finding an apprenticeship, I will think that occupation is not everything in life") associated with generally lower aspirations. Students who were disengaged from finding an apprenticeship also did not further adjust their aspirations in the course of the last school year. As already discussed above, this is one of the most maladaptive strategies adolescents can use. Note that no significant correlations were found for compensatory primary control. This type of control striving was not associated with the adjustment of aspirations.

The findings obtained for selective primary and selective secondary control are interesting for at least two reasons. First, they show how well these two aspects of phase-adequate control striving work together and inform adaptive behavior. Both selective primary and selective secondary are associated with the enhancement of the individual's ambitions and motivational commitment as indicated by high initial aspirations. However, only selective primary control is associated with reality oriented control striving as indicated by the subsequent downgrading in aspirations. In other words, selective secondary control only is not enough and could even turn out maladaptive if not supported by selective primary control.

Moreover, the results suggest that the adjustment of aspirations predicted by phase-adequate control striving runs contrary to naïve conceptions of goal engagement. It is not simply high persistence for high aspirations that is the hallmark of adaptive goal striving. Instead, adaptive goal striving includes elaborated and dynamic adjustment of aspirations to the given opportunities. This is exactly what the life-span theory of control proposes. Successful development is not only characterized by tenacious pursuit of all possible goals, but involves decisions about selection, optimized goal adjustment and compensation at the same time (Heckhausen, 1999).

When using the calibrations scores of aspirations and thus controlling for school achievement, slightly different results emerged. Although, as mentioned above, the model seems to hold up even when controlling for school achievement, there are some differences in the prediction of the calibration scores trajectory. From all effects of goal engagement strategies, only the effect of selective primary control on the adjustment of aspirations remained significant. Selective primary and selective secondary control did not predict the level of calibration, presumably because of their confounding with school achievement. Students with better grades are also more committed to finding an apprenticeship. However, the effect of selective primary control could be demonstrated for the downgrading of the calibrations scores, too. The most plausible interpretation of this finding is that students adjust their vocational aspirations around an individual set-point which is defined by the school achievement. Adolescents facing the transition to work thus seem to have quite a refined knowledge about the mechanisms of the apprenticeship market and their own "market value". Heckhausen and Tomasik (2002) found that adolescents adjusted their vocational aspirations very carefully to their school achievement and that even the social prestige of their (sometimes illusory) "dream job" became more realistic in the course of the last school year. Interestingly, those students who initially reported "dream jobs" way below their actual potential also adjusted them in terms of social prestige. However, this adjustment was in the upward direction which further supports the interpretation of it as a stronger orientation towards reality instead of simply downgrading aspiration as a result of despair. The small, but nevertheless systematic and significant, effect sizes for the adjustment of aspirations both downward and upward support the notion that compromising in social prestige takes place in a narrowly circumscribed band of acceptable options. As our results show, this adjustment is primarily driven by high goal engagement in terms of selective primary control.

Compensatory secondary control associated with the initial level of calibration in a particularly maladaptive way. Youth who were more disengaged from finding an apprenticeship at the same time had aspirations way above their actual school achievement. They thus started off with unrealistically high vocational aspirations and did not adjust these over time. Note that since we excluded all who indicated that they wanted to attend college this finding cannot be explained by the fact that

college-bound students are highly disengaged from finding a regular apprenticeship and rather strive for more prestigious jobs which are accessible after college.

We are convinced that the model introduced in principle holds in other contexts of transition, too. Its basic assumptions can also be transferred to other achievement related tasks beyond the transition from school to work. Take, for example, a parent who seeks a new job after parental leave. This parent would first apply for jobs which are commensurate with previous qualifications but then eventually downgrade to other options. One can think of many other situations where our model applies and we are convinced that it can be very useful for the investigation of other achievement related situations. Its conceptual proximity to expectancy-value-models (see Heckhausen & Heckhausen, 2008) makes it a versatile tool within an established theoretical tradition. Further research is needed, though, to prove its scientific value.

The results presented in this study have also some important implications for vocational counseling and intervention at the transition from school to work. To profit from the association between the social prestige of occupations and the accessibility to the respective training positions or jobs, adolescents need relevant information pertaining to the different vocational options. Also, the association itself may become an issue in counseling, allowing adolescents more deliberately adjust their aspirations to the given opportunities. We are not aware of any program that conveys such information to adolescents together with providing strategic advice for optimal application behavior. This study may have much value for designing such counseling programs.

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