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# Co-development of educational expectations and effort:

# Their antecedents and role as predictors of academic success

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## Abstract

This study examined the co-development of educational expectations and effort (conceptualised as indicators of individual agency) during secondary school and assessed their role as predictors of academic success, controlling for prior academic attainment and parental social background. Drawing on data collected for the Longitudinal Study of Young People in England (LSYPE), a nationally representative sample, the findings suggest reciprocal effects between expectations and effort, shaped by family SES and prior academic attainment. Agency is not a static construct, it is not fully determined by family SES and students adapt their functioning and choices in response to informative feedback loops.

## Introduction

Educational expectations expressed during secondary school have been identified as a significant influence shaping subsequent academic and occupational attainment, even after controlling for prior academic attainment and family background (Reynolds & Johnson, 2011; Schoon & Parsons, 2002). Indeed, it has been argued that 'one of the most important early predictors of social mobility is how much schooling an adolescent expects to obtain' (Schneider & Stevenson, 1999, p. 4). Yet educational expectations are not a sufficient factor for later success. It has been argued that besides prior academic achievement academic effort is the next best predictor of student's learning development and achievement (Robbins, Allen, Casillas, Peterson, & Le, 2006), and the willingness to exert effort in pursuing academic tasks is considered to enhance academic attainment (Locke & Latham, 2002; Richardson, Abraham, & Bond, 2012; Trautwein, 2007). Educational expectations have a significant influence on multiple measures of student effort, even in contexts in which college expectations are normative (Domina, Conley, & Farkas, 2011), yet research on the conjoint development of educational expectations and effort during secondary school is scarce. The aim of this paper is to fill the evidence gap by examining the co-development of educational expectations and effort during secondary school and their impact on participation in higher education by age 19/20 in a national representative sample, controlling for family background and prior academic attainment.

The study is guided by a socio-ecological framework for the study of human agency (Schoon & Lyons-Amos, 2017) taking into account person-environment interactions and the co-development of capabilities and resources over time. The approach is informed by ecological theories of human development (Bronfenbrenner, 1986), in particular life course theory with its emphasis on the timing and the socio-cultural context in which development takes place (Elder, 1998) and Bandura's social cognitive theory of agency (Bandura, 2001).

The socio-ecological model includes the measurement of social structures that circumscribe goal pursuit, multiple indicators of agency, and specification of developmental processes. Family socio-economic background is understood as an indicator of social structure that can influence individual feelings and actions. Individual agency is defined as the human capacity to exercise control over the nature and direction of one's life (Bandura, 2001) with a focus on indicators of intentionality (educational expectations) and self-regulation (effort) which are both considered important in explaining academic development. Taking a developmental perspective we assess a. predictors of agency; b. the co-development of educational expectations and effort during secondary school; and c. the role of educational expectations and effort as predictors of later academic attainment, controlling for prior academic performance and family background.

**A socio-ecological model of agency development**

The notion of agency is relevant across the social sciences, in particular within psychology and sociology. Within psychological theories of motivation it is conceptualised as the capability to navigate through a complex world, allowing individuals to make good judgements about their capabilities, anticipate the probable effects of different events and courses of action, appraise socio-structural opportunities and constraints and regulate their behaviour accordingly (Bandura, 2001). It is argued that human development is embedded within a social context – yet the mechanisms linking structural factors to action are left largely unexplained (Bandura, 2006). Recent attempts to reconceptualise the notion of agency within a life course approach acknowledge that individual action is circumscribed by structural constraints and aim to specify the reciprocal processes linking structure and agency (Hitlin & Elder, 2007; Hitlin & Johnson, 2015; Schoon & Lyons-Amos, 2017). This study builds on these endeavours and aims to specify the processes shaping the development of agency over time and in context. In particular, we test assumptions regarding processes of

social causation, selection and adaptation. Social causation concerns the structural influences on agency, i.e. influence of family background on the formation of agency processes. Selection effects refer to the independent effects of individual choice or agency, over and above the impact of social structure, and adaptation refers to the refinement and calibration of agency in response to changing circumstances.

*Multiple dimensions of agency*

Agency is understood as a multi-dimensional construct involving orientations to the past, the present and the future (Bandura, 2001; Hitlin & Elder, 2007). For example, Bandura (2001, p. 1) conceptualises the core features of the human capacity to exercise control over one's life as 'the temporal extension of agency through intentionality and forethought, self-regulation by self-reactive influence, and self-reflectiveness about one's capabilities, quality of functioning and the meaning and purpose of one's life pursuits'. It is informed by past behaviour and experience, reflections about one's capabilities within given constraints and opportunities, and orientations toward the future (i.e. expression of goals and future expectations). In this study we focus on the notions of intentionality and self-regulation which are considered crucial components of human development. Examining how they are shaped by structural constraints, how they co-develop over time, and their role as predictors of later academic attainment will give us a better understanding of how multiple dimensions of agency develop over time and in context. To our knowledge this is the first study to examine the social embeddedness of agency development as we define it during secondary school and beyond using a national representative sample.

*Structural influences on agency*

Educational expectations and attainment are circumscribed by socio-economic resources available to the family (Reynolds & Johnson, 2011; Schoon & Parsons, 2002). For example, according to the Wisconsin status attainment model, family background and academic ability

influence educational and occupational expectations which in turn shape later attainment (Andrew & Hauser, 2011). Young people from less privileged backgrounds report lower levels of educational achievement motivation, even when levels of prior academic attainment are held constant, are leaving education earlier and are less likely to continue in higher education than their more privileged peers. Explanations of these associations refer to cumulative risk effects (DiPrete & Eirich, 2006), which imply the lack of: financial resources, time or energy of parents to invest in the education of their children, familiarity with the dominant culture, social networks and connections, or access to warm and supportive parenting. Evidence regarding the association between family background and academic effort is however limited. Previous studies suggest that associations are generally weak (De Fraja, Oliveira, & Zanchi, 2010; Trautwein & Luedtke, 2009), i.e. children from different social backgrounds do not differ greatly in their propensity to exert effort.

In assessing the role of social background we take into account that socio-economic risks rarely occur in isolation; that the relationship between any single risk factor and subsequent outcomes tends to be weak and that serious risk emanates from the accumulation of risk factors (DiPrete & Eirich, 2006). We thus consider the impact of multiple socio-economic risk factors including indicators of parental education, occupational status and income. Doing so will provide a more comprehensive description of the socio-economic resources available to young people today, and more accurately predict and understand developmental outcomes.

Moreover, we acknowledge that human development is embedded within the wider social context and that individual expectations and actions are shaped by structural opportunities. Since the 1980s, in the aftermath of technological innovations and the rising need for skilled workers, increasing numbers of young people are expecting to go to university – a development that has been described as the 'college for all ethos' (Rosenbaum,

2001). Expectations to get a college degree have been raised, including among students from less privileged families, ethnic minorities and women (Schneider & Stevenson, 1999; Schoon, 2010). Moreover, the association between educational expectations and academic ability has reduced (Reynolds & Johnson, 2011; Schoon, 2010) raising concerns that young people have become unrealistically ambitious. Yet, assessing the difference between expected and actual college graduation rates across a range of OECD countries Jerrim (2014) concludes that on average educational expectations expressed at age 15 are not out of touch with reality. For example, evidence from the PISA 2002 study suggests that educational expectations are in general well aligned with actual academic ability, and in most countries, except the US, are aligned with average graduation rates of roughly 40% across the countries considered (Jerrim, 2014). It can however also be the case that individuals, especially those from less privileged background, express low expectations for going to university even if they performed well in academic assessments during primary school. The question thus arises, if expectations formulated prior to relevant examinations, such as at the end of compulsory secondary school, may influence subsequent performance, a phenomenon described as 'anticipatory decisions' (Jackson et al., 2007). If students expect that they will not go to university they might decide to work less hard, and perform less well in school.

There are furthermore gender differences, and girls are generally more ambitious than boys, report higher levels of effort, gain higher grades and are more likely to participate in higher education (Schoon & Eccles, 2014), although the strength of gender differences may vary depending on school subject (Trautwein & Luedtke, 2009).

*Development of agency over time*

Regarding the development of educational expectations, there is evidence that most children express intentions with regard to future education participation very early in their secondary school careers, that these intentions remain relatively stable over time, and that they are good

predictors of actual behaviour (Anders & Micklewright, 2015; Domina et al., 2011). Regarding the stability of expectations to go to university it has however been noted that students seem to scale down their educational expectation as they progress through the education system (Domina et al., 2011). For example evidence from the Longitudinal Study of Young People in England (LSYPE) suggests that during secondary school expectations reduced from about 69% of students expecting to go to university at age 13/14 to 57% by age 16/17, of which the majority did actually apply by age 19/20 (Anders & Micklewright, 2015).

Although academic effort has been identified as a vital predictor of student's learning development and achievement (Richardson et al., 2012; Robbins et al., 2006) there is little evidence of how it develops over time. Nor is there sufficient understanding regarding the conjoint development of educational expectations and effort, how these two indicators of agency are shaped by family background and prior academic attainment, and their relative role as predictors of subsequent attainment. Are students pushed towards their educational outlook and attainment by aggregate family resources, do they independently select and chose specific goals, or do they adapt their expectations and effort due to informative feedback loops?

Based on previous evidence we expect that family social background has a significant influence on educational expectations. According to the status attainment model, the educational expectations of young people are largely determined by their social background, stabilise early in the educational career and are thus understood as a static construct (Andrew & Hauser, 2011). In our approach we question this assumption of stability in development and expect continuity and change. Developmental changes occur due to changes in the way the individual interacts with experience, where changes in one area of development may become amplified or spread to other areas of development, or where individuals select different goals. For our study this implies that educational expectations and effort are not

stable but change over time, informed by feedback loops from other levels of functioning, and experiences in the wider context. The socio-ecological model assumes that each level of functioning affects changes of activity of another. It can be tested using a cross-lagged model, specifying assumptions of social causation, selection and adaptation between different spheres of influence over time.

*Research questions and hypotheses*

*1. Antecedents of agency: processes of social causation*

We expect educational attainment and expectations to be circumscribed by family social background (Andrew & Hauser, 2011; Reynolds & Johnson, 2011; Schoon, 2010), i.e. young people growing up in a disadvantaged family context show lower levels of educational attainment, and both family SES and academic attainment, in turn, shape individual agency. Regarding the role of prior academic attainment we assume that it informs both educational expectations and effort (Domina et al., 2011; Poorthuis et al., 2015). In particular we expect a calibration effect, i.e. that prior academic attainment provides information about one's potential capability which is used to fine tune one's future expectations and regulation of effort. If prior academic attainment is high we expect educational expectations to be high as well, reflecting a level of realism (Jerrim, 2014). We also expect high levels of academic attainment to be effective in increasing student effort (Poorthuis et al., 2015). Students who do well academically at one point in time may want to maintain their academic standing, or want to raise it by putting in more effort. At the other end of the spectrum, one can assume that low grades are associated with reduced effort, although it could also be the case that low grades urge students to put more effort.

It can, however, also be the case that young people in disadvantaged families express lower education expectations and effort than their privileged peers, even if they did well academically. They might, for example, decide not to go to university early on in secondary

school and not invest time and effort in getting the necessary grades. Yet agency is not necessarily fully determined by social background and individuals are to some extent agents of their own development. Moreover, the impact of structure might vary for different dimensions of agency. While evidence regarding the association between family SES and education expectations is well established, only few studies examined the influence of SES on effort. Based on previous evidence (De Fraja et al., 2010; Trautwein & Luedtke, 2009), we expect that children from different social backgrounds do not differ much in their willingness to exert effort, i.e. the association between social background and effort is expected to be low. Our approach and assumptions differ from traditional linear models of development in that we expect transactions, where changes in one adjustment domain can bring about changes in another domain. Moreover, we test developmental processes linking social background, academic attainment, education expectations and effort over time.

## *2. Co-development of educational expectations and effort: processes of adaptation*

To gain a better understanding to what extent these educational expectations and effort re-inforce each other during secondary school we test their development and co-regulation over time. In the absence of prior evidence we take into account two separate but not mutually exclusive hypotheses. According to the intention hypothesis, we assume that expectations drive effort. In order to succeed with their goals students are willing to exert effort to achieve it. According to the effort hypothesis we expect that willingness to exert effort causes individuals to raise their expectations over time. If you are going to work hard, you expect to apply your competences in the future. It is likely that both intention and effort are important in explaining the development over time, that there are feedback loops where individuals who expect to go to university work hard to achieve their goal, which in turn increases their expectations, and vice versa. The two processes work in conjunction, enabling the individual to adjust and develop within given constraints. In our model we control for family social

background, prior academic attainment, and concurrent associations between educational expectations and effort to gain insights into the independent underlying processes of adaptation and calibration in agency development over time.

*3. Predicting developmental outcomes: assessing potential selection effects*

Academic success in our study is indicated by two outcome measures: academic attainment at the end of secondary school and subsequent enrolment in university. We examine continuity of academic attainment over time, linking attainment at the end of primary school to attainment at the end of secondary school, taking into account the influence of family social background. We furthermore test potential intermediary processes that might change or accelerate the course of development based on the co-development of educational expectations and academic effort. We expect processes of continuity (i.e. cumulative disadvantage or social causation), adaptation, as well as independent selection effects. These processes can work in conjunction, enabling the individual to develop agency, to adjust, and (if the obstacles are not overwhelming) to transcend given constraints. Cumulative effects are given where young people with less privileged parents are performing less well academically, have lower educational expectations and are less likely to enrol in university. Adaptive effects are reflected in the co-regulation of expectations and effort, where change in one domain of functioning is associated with change in other domains, which in turn shape subsequent outcomes. Independent selection effects refer to the unique contribution of expectations and effort in driving academic success over and above the influence of social background and prior academic attainment. For example, if in the multivariate model education expectations and effort predict academic outcomes net of differences of parental SES and prior academic attainment, we assume that individuals are able to be active agents shaping their development.

## Method

**Procedure and sample**

This study used data from the Longitudinal Study of Young People in England (LSYPE) which is a panel study of 15,770 young people born between 1st September 1989 and 31st August 1990. Sample members were young people in school year 9 (age 13/14) or equivalent, in England in February 2004. Annual face-to-face interviews have been conducted with young people and their parents between 2004 and 2010, and linkage is available to administrative data, such as the National Pupil Database (NPD), which includes national academic assessments for all children in England (for more details see https://www.education.gov.uk/ilsype/workspaces/public/wiki/Welcome).

This study predominantly uses data from the first three waves of data collection which occurred when all participants were completing the final three years of compulsory secondary education. We focus on these three waves because after this period young people take a range of alternative pathways into further education or work and the key constructs of education expectations and school effort no longer apply to all participants. Data from the most recent wave (7) were used to assess whether young people had attended university. All participating individuals consented to having their responses linked with statutory examination data.

**Measures**

*Parental socio-economic status (SES)* was measured at wave 1, comprising indicators of parental education, social class and income. *Parental education* indicates the highest level of education of either parent on a 6 point scale, ranging from no educational qualifications (0) up to degree level qualifications (5). *Gross household income* was reported by the main parent. Annual banded income was measured in eight groups (e.g., 1=less than £5,200 per annum; 2=£5,200 to £10,400, … up to 8=more than £55,000). Parental social class was assessed using the National Statistics Socio-economic Classification (NS-SEC), differentiating

parents in routine and manual (1), intermediate (2), and higher professional and managerial (3) occupations.

*Academic attainment* measures are based on information from the NPD. Indicators of attainment at the end of primary school when pupils were approximately 10-11 years old include grades in Maths, English and Science (Key Stage 2). Measures of secondary school attainment were the average point scores attained across all subjects, obtained from formal national examinations at the end of secondary school (GCSEs and equivalents), carried out when pupils were approximately 15-16 years old.

*Educational expectations.* At waves 1 to 3, university aspirations were assessed with a single item asking respondents: "How likely do you think it is that you will ever apply to university to do a degree? Would you say it's… very likely, fairly likely, not very likely, not at all likely?" Responses were recoded 1 to 4 where higher values represent a greater likeliness to apply to university.

*Effort.* At waves 1 to 3, investment in school work was assessed with five self-report items: school is a waste of time for me, I work as hard as I can in school; school work is worth doing; the work I do in lessons is a waste of time; the work I do in lessons is interesting to me ($\alpha$ range = .68 to .71). Reponses were made on a four point scale from 1=strongly agree to 4=strongly disagree. Responses to each item were coded and summed so that higher values represent higher investment in school work.

*University attendance.* In the last wave of data collection at age 19/20 years cohort members were asked to report their main activity. Those who answered that they attended university did so straight after leaving school or after a single year's break (gap year).

**Statistical analysis**

The analyses consisted of a cross-lagged panel model assessing the longitudinal associations between university aspirations and school effort over the last three years of secondary school

(from ages 13/14 to 15/16 years). Two predictors and two outcome variables were included alongside the cross-lagged panel analysis. The predictors were pupils' prior academic attainment at the end of primary school, as well as parental SES which was measured as a latent variable based on indicators of highest educational qualifications, social class and income (standardised factors loadings = .59 to .73). Family SES has been shown to be associated with academic attainment. The two variables share some genetic as well as environmental influences, and in our model are operationalized as correlated independent variables. This approach is considered as a preferable, theory-neutral, position until more is known about the causal relations and patterns of interaction of these two variables (Deary et al., 2005). The outcome variables were two indicators of academic success, comprising pupils' academic attainment at the end of secondary school and a binary variable indicating whether the young person was attending university or not at age 19/20 years.

Analyses were run in a structural equation modelling (SEM) framework using Mplus version 7 (Muthén & Muthén, 2012). Due to the complex sampling strategy of the LSYPE, we utilised the cluster, stratification, and design weight options in Mplus. All ordinal and continuous measures were standardised prior to SEM to aid model convergence, but raw descriptive statistics (*M, SD)* are given in table 1. Similar to most longitudinal cohort studies, the sample size reduced over time. The total available sample sizes were 15,770 at wave 1, 13,539 at wave 2, 12,439 at wave 3, and 9,791 at the wave 7 follow-up. To reduce the bias arising from attrition, missing data were handled with full information maximum likelihood (FIML) which uses all available data (N=15,770) rather than deleting participants or imputing values (Schafer & Graham, 2002). Montecarlo integration methods are required when mediating variables have missing data and a design weight is used (Muthén & Muthén, 2012). One consequence of using a design weight alongside montecarlo integration is that traditional fit indices are not available (e.g., chi-square, RMSEA, CFI). In an attempt to

provide some indicators of model fit we report the traditional fit indices obtained from running the same model without the design weight option. To test for gender differences in pathways multi-group analysis was conducted. Models were compared where paths were freed versus fixed across genders using the difference between log likelihood statistics for each model. Two sensitivity analyses were conducted to assess whether the main findings differed (i) after controlling for young peoples' ethnicity and relative age, and (ii) using an analytic sample with complete cases only. The substantive results did not differ from those reported here.

## Results

Correlations and descriptive statistics for the main study variables are shown in Table 1. The results from the structural equation model are shown in Figure 1. The structural equation model showed satisfactory fit to the data when run without the design weight, $\chi^2(40)= 1194.78$, $p<.000$, RMSEA= .04, CFI= .93.

Family SES and academic attainment at the end of primary school were strongly associated. Educational expectations and effort were associated with both family SES and prior academic attainment. As shown in Figure 1, after controlling for prior academic attainment, pupils whose parents were of higher SES reported higher educational expectations ($\beta$= .21) and also higher school work investments, although this latter association is rather weak ($\beta$= .06). Higher attaining pupils had greater expectations to attend university at the start of the study (age 13-14 years) and also reported exerting more effort in their school work, though the association with effort was weaker ($\beta$= .13) than that with expectations ($\beta$= .34). Results of path analyses presented in Figure 1 show that higher attainment at the end of primary school predicted higher levels of effort and higher expectations to attend university over and above controls for family SES, although the associations were only of small to moderate size

The results shown in Figure 1 also provide insight into the co-development of university expectations and school effort during secondary schooling. There was strong continuity of educational expectations over time ($\beta$= .63 and .70), and slightly less continuity for academic effort ($\beta$= .50 and .56). There were moderate concurrent associations between academic expectations and effort, which became smaller over time. We furthermore found evidence of reciprocal effects between expectations and school effort over time. Higher expectations at waves 1 and 2 predicted higher effort at subsequent study waves ($\beta$= .13 and $\beta$= .15). Similarly, higher effort in school work at waves 1 and 2 predicted higher expectations at subsequent study waves ($\beta$= .12 and .09).

Do educational expectations and effort predict university attendance, over and above family social background and the influence of academic attainment? A substantial amount of variance in academic attainment at the end of secondary school was explained by the path model ($R^2$= .58). There was considerable continuity of academic achievement over time where attainment at the end of primary school predicts attainment at the end of secondary school ($\beta$ = .58). Yet, educational expectations and effort manifest at age 15/16 also played a significant and independent role in predicting later attainment after controlling for the other variables in the model. The path model explained a substantial amount of variance in university attendance ($R^2$= .60).

In a series of mediation models we tested a. the direct influence of SES on university attendance; b. the joint influence of SES and academic attainment on the outcome, not taking into account the role of agency (results not shown in Figure 1), and c. the combined influence of all factors included in the model. The bivariate direct association between SES and university attendance was strong ($\beta$ = .46, $p$<.001). It was attenuated after adding academic attainment measured at the beginning of secondary school to the model: with the influence of SES being of moderate size ($\beta$ = .26, $p$<.001) and that of academic attainment on university

attendance being moderate to strong ($\beta$ = .47, $p$<.001). These effects were attenuated after adding the agency factors and subsequent attainment to the model (see Figure 1), reducing substantially for SES ($\beta$= .16), suggesting that the influence of SES on participation in higher education is partially mediated by the variables included in the model. Also shown in Figure 1 is that academic attainment at the end of secondary school ($\beta$= .42, OR [odds ratio]= 3.50) and university expectations during the last year of secondary school ($\beta$= .38, OR= 2.86) were both moderately strong predictors of university attendance. School effort in the final year of secondary school was positively correlated with university attendance ($r$= .27, $p$ <.001) as shown in Table 1, however, in the path model (which simultaneously controlled for the effects of attainment, aspirations and SES) this direct association between school investment efforts and university attendance was substantially attenuated ($\beta$= .05, OR=1.16).

Results of the multi-group analysis suggest significant gender differences (at the 1% level) in the pathways linking family SES to educational expectations ($\beta$= .23, $p$ <.001 for males versus $\beta$= .19, $p$ <.001 for females) and effort ($\beta$= .09, $p$ <.001 for males versus $\beta$= .03, $p$ >.05 for females) which affected males more strongly than females. Moreover, boy's educational expectations were more strongly influenced by prior academic attainment ($\beta$= .15, $p$ <.001 for males versus $\beta$= .09, $p$ <.001 for females) and their expectations had a slightly stronger impact on academic attainment at the end of secondary school ($\beta$= .27, $p$ <.001 for males versus $\beta$= .24, $p$ <.001 for females).

## Discussion

Students use different strategies to formulate, refine and reach their goals, but the underlying mechanisms are not yet fully understood. This study applied a socio-ecological approach, specifying the transactions between a changing individual and a changing context and agency development over time.. We examined a.) antecedents of educational expectations, conceptualised as agentic intent, and effort which is understood as an indicator of agentic

self-regulation; b.) the co-development of intent and self-regulation; and c.) their role as predictors of university attendance, controlling for family SES and academic attainment. The findings provide a better understanding of the interaction between intent and self-regulation, and the role of social causation, selection, and adaptation effects. Agency is not a static construct, it is not fully determined by family SES, and students adapt their functioning and choices in response to informative feedback loops. Moreover, we find that agency shows an independent association with transition outcomes after controlling for SES and academic attainment, providing evidence for the assumption of selection effects.

*Antecedents of educational expectations and effort – the role of social causation*

Family SES significantly influences educational expectations, and to a lesser extent effort, after controlling for prior academic attainment. The associations between SES and the two agency indicators are however of only small to moderate size, suggesting that young people formulate their own educational expectations and willingness to exert effort above and beyond constraints imposed by family socio-economic resources. Academic attainment at the end of primary school shows a moderate strength association with educational expectations expressed in the middle of secondary school, suggesting a degree of realism in the formulation of expectations for the future – but also considerable scope for variation in response, which might manifest in lowered education expectations of less privileged students, despite good academic attainment, or overambitious choices. The association between prior academic attainment and effort is only small suggesting that these two variables might be even more independent.

In interpreting the findings one also has to consider that family SES is significantly associated with academic attainment at the end of primary school, suggesting that some of the influence of family background on individual agency is mediated via academic attainment. However, although the association between family SES and academic attainment is strong, it

does not explain more than 25% of the variation in attainment. The findings thus suggest that the development of agency is weakly to moderately influenced by family SES, that students are to a considerable extent agents of their own development, and that educational expectations are more strongly influenced by family SES and prior academic attainment than the willingness to invest effort in academic work.

*Co-development of educational expectations and effort – processes of adaptation*

Educational expectations and effort re-affirm each other while students progress through secondary school. There is considerable continuity of both measures over time - more so regarding educational expectations than effort. Possibly effort is more unstable over time, as student's school experiences change across the years, for example due to changing teachers and different feedback on their performance, while education expectations are more stable, reflecting broader cultural factors prioritizing college for all.Yet, for both measures there is a degree of fluctuation. On aggregate students scale down their expectations when approaching the end of compulsory schooling, especially those who were less certain in the beginning, while a large proportion those who were 'fairly likely' to apply are hardening their intention, becoming 'very likely' (Anders & Micklewright, 2015). These fluctuations potentially indicate a fine tuning of expectations in response to feedback from teachers and peers and ongoing assessments in school, and a polarization between those who intend to go to university and those who do not.

Regarding the co-regulation of the two indicators of agency, we find evidence for both the intention and effort hypotheses. The intention hypothesis is that educational expectations expressed early during secondary school can influence subsequent effort, independent of prior academic attainment and family background influences. The effort hypothesis is that higher willingness to exert effort leads to increased educational expectations. The relative contribution of intention versus effort is small but of similar

strength and continues over time, such that change in one dimension is associated with change in the other dimension. Educational expectations and effort develop along transactional processes of adaptation involving co-regulation and developmental change. The intention and effort hypothesis are simultaneously true for the developmental period we observed. There seem to be feedback loops, where increases in expectations are associated with later increases in effort, which are associated with later increases in expectations, and so on. Intention and effort thus co-regulate each other.

Moreover, we find moderate concurrent associations which slightly reduce over time. This is a surprising finding, as one would expect students with high expectations to increase their effort as they approach the end of secondary schooling and prepare for the important GCSE examinations. It could be the case, that more realistic expectations at the end of secondary school do not inspire students to work as hard as when they are pursuing more idealistic expectations earlier on. Moreover, students who perceive themselves as on track for tertiary education may not necessarily inclined to work hard, indicating a 'fixed mind set' (Burnette et al., 2013), 'over confidence' not recognizing the effort needed to succeed, or being ill-informed and not anticipating the probability of failure (Rosenbaum, 2001; Schneider & Stevenson, 1999). It could however also be the case, as mentioned earlier, that expectations remain more stable due to cultural pressures, while effort becomes less stable due to changing educational experiences, and thus the association between these two agency indicators reduces.

*Predicting academic success – evidence of selection effects*

Educational expectations and effort both predict academic attainment at the end of secondary school, after taking into account family background and academic attainment at the end of primary school. We find evidence for both cumulative risk and independent selection effects. Educational expectations and effort are circumscribed by experiences in the

family context, yet they also reflect important aspects of individuals' agentic decision making. Crucially, according to Bandura's (2001) social cognitive theory, plans and intentions require purposeful behavioural action if they are to be realised. The implications for expectations to attend university are that these intentions will only be realized if they result in behavioural changes such as increased effort in school work. However, our findings suggest that after taking into account academic attainment in the GCSE examinations, effort plays a less vital role than educational expectations in predicting enrolment in university. This might be due to different foci and time horizons involved in the two indicators of agency: while education expectations are reflecting intentions for future university attendance, effort taps more into general school behaviours, the immediate day-to-day activities which are instrumental and necessary for survival in school but less directly linked to future attendance at university. Thus, while effort is important to gain the necessary grades, educational expectations appear to be more important as a driving force for subsequent action. To what extent students will be able to complete their studies successfully remains however to be seen.

*Gender effects*

Females report higher levels of educational expectations and effort than males, although gender is only weakly associated with these two indicators of agency. In addition, for males socio-economic background and prior academic attainment is more important in shaping their educational expectations and effort than for females. Also, male educational expectations were more strongly influenced by prior academic attainment than female expectations. As suggested in previous research, parents from less privileged background might show higher support for their daughters to continue in higher education than for their sons, and males from less privileged backgrounds might need more reassurance and rely more on direct observation of previous attainment in order to formulate and pursue academic goals (Schoon, 2010).

*Limitations*

In interpreting the findings some strengths and limitations of our study have to be considered. The study is based on a large, representative sample of young people in England which was followed annually from the beginning of secondary school. As with all research using longitudinal data, this work is constrained by having to make the best use of available data and the attrition of respondents over time. It may be that missing data at the individual level and at the variable level has affected the validity of the results. The FIML approach has been adopted as a 'best effort' technique for dealing with these problems (Schafer & Graham, 2002), but bias in our model estimates may still be present. The study focused on only two dimensions of agency: intention and effort. Future studies have to explore the interplay of different dimensions in more detail, including self-reflection and foresight. We also did not assess other potential influences shaping the formation of agency, such as support by parents, teachers or peers, or school-level characteristics such as social or ability mix. The study follows students only up to age 19/20 and a longer time period is needed to establish the long-term outcomes of expectations and effort expressed in secondary school. It could well be that more students enrol at university after the age of 20, or that some might drop out of higher education, thus not realizing their aspirations after all. It also has to be taken into consideration that independent variables can change over time as well as dependent variables. In the case of family background, however, there is evidence that parental social class and education remain relatively stable over time. Moreover, we analyse inter-individual changes, not intra-individual change. The findings are thus limited to an understanding of change at the aggregate level. Furthermore, the study is based on data collected in England, and it might be that the country specific context, characterized by a comprehensive education system, a relatively unregulated school-to-work transition system, and a slightly higher rate of tertiary education than the European Average (OECD, 2014) limits the generalisation of findings.

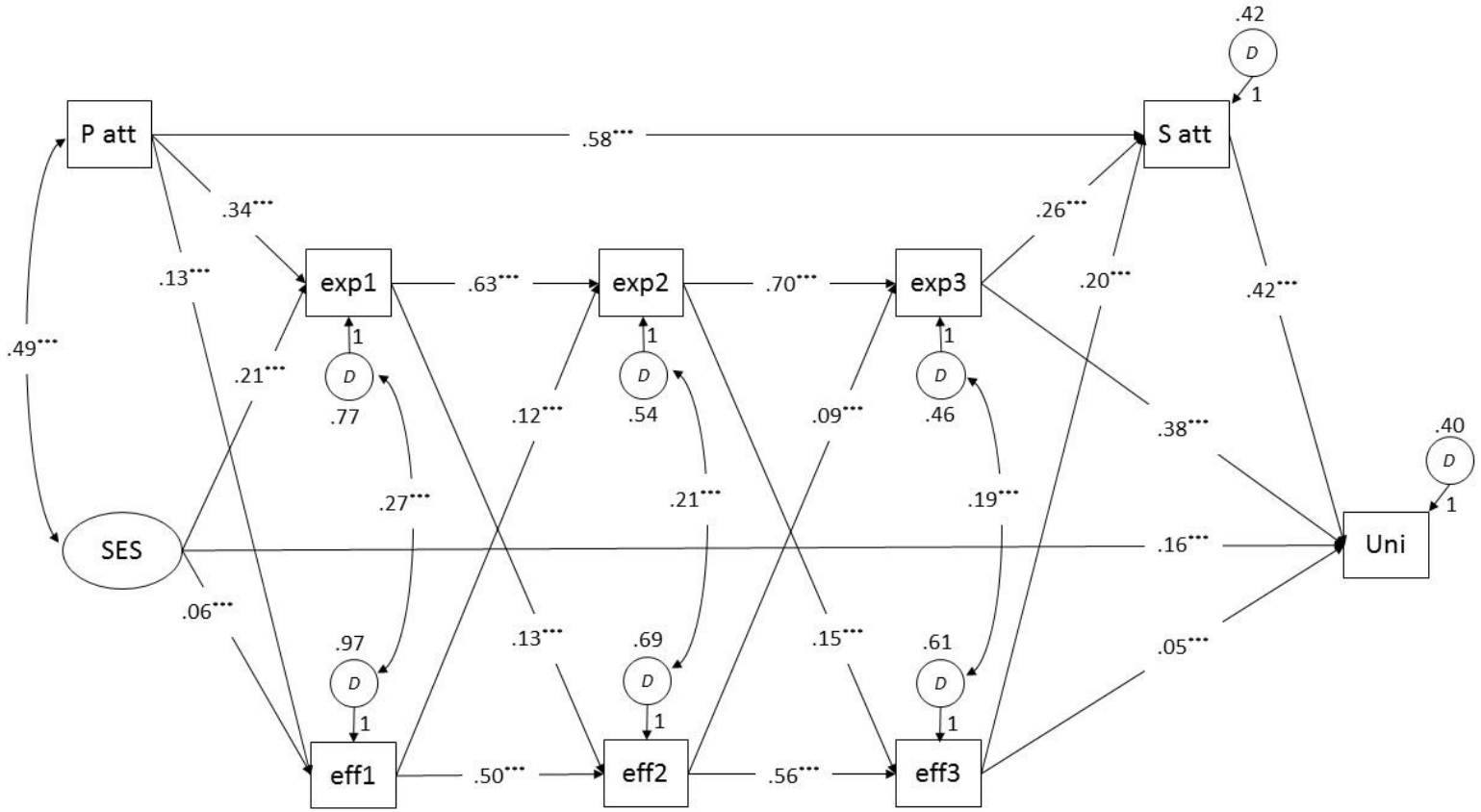
Nonetheless, this study is one of the first to examine the co-development of educational expectations and effort over time, taking into account the role of family background and prior academic attainment as well as subsequent educational outcomes, using a nationally representative and large dataset. The findings underline the importance of conceptualising the formation and development of agency, here conceptualised by indicators of educational expectations and effort, as a dynamic process informed by socio-economic circumstances (social causation), individual level capabilities (selection effects), and adaptation, i.e. the refinement and calibration of agency in response to changing circumstances. Integrating assumptions of the social cognitive theory of agency (Bandura, 2001) with life course theory and transactional models of human development gives us a tool to examine how social context effects inform micro-level processes of development which in turn shape future developmental outcomes.

**Table 1. Correlations among main study variables.**

| | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.Primary school attainment | | | | | | | | | | | | | |
| 2.Parental occupational class | .32*** | | | | | | | | | | | | |
| 3.Parental education | .37*** | .51*** | | | | | | | | | | | |
| 4.Parental income | .30*** | .43*** | .43*** | | | | | | | | | | |
| 5.Education expectations W1 | .44*** | .27*** | .28*** | .13*** | | | | | | | | | |
| 6.Education expectations W2 | .47*** | .29*** | .29*** | .14*** | .66*** | | | | | | | | |
| 7.Education expectations W3 | .50*** | .29*** | .31*** | .16*** | .61*** | .73*** | | | | | | | |
| 8.Effort W1 | .15*** | .08*** | .10*** | .04** | .31*** | .31*** | .29*** | | | | | | |
| 9. Effort W2 | .17*** | .10*** | .10*** | .04*** | .28*** | .36*** | .33*** | .52*** | | | | | |
| 10. Effort W3 | .17*** | .09*** | .10*** | .04*** | .27*** | .34*** | .39*** | .47*** | .59*** | | | | |
| 11.Secondary school attainment | .70*** | .34*** | .38*** | .29*** | .44*** | .52*** | .57*** | .26*** | .31*** | .34*** | | | |
| 12.University attendance | .46*** | .30*** | .32*** | .21*** | .54*** | .61*** | .66*** | .25*** | .29*** | .31*** | .67*** | | |
| 13.Female (male reference) | .03** | .01 | .01 | -.02 | .08*** | .12*** | .14*** | .05*** | .07*** | .09*** | .12*** | .09*** | |
| *M* (all) | 27.14 | 1.98 | 3.60 | 4.54 | 2.86 | 2.74 | 2.70 | 16.27 | 15.56 | 15.61 | 369.67 | 0.35 | 0.48 |
| *SD* (all) | 4.06 | 0.90 | 1.60 | 1.93 | 1.01 | 1.06 | 1.15 | 2.34 | 2.45 | 2.52 | 161.63 | 0.51 | 0.50 |

*Note.* ***$p$< .001, **$p$< .01, *$p$< .05

**Figure 1. Path coefficients from structural equation model (standardised coefficients).**




*Notes*. SES: socio-economic status; P att: attainment at end of primary school; S att: attainment at end of secondary school; exp1, exp2, exp3: expectations to attend university at study waves 1, 2 and 3 respectively; eff, eff2, eff3: school effort at study waves 1, 2 and 3 respectively; Uni: university attendance. $^{***}p < .001$.

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