



Neighbourhood effects on educational attainment of adolescents, buffered by personality and educational commitment



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ABSTRACT

Research has repeatedly shown that neighbourhood disadvantage negatively influences individual educational outcomes. However, the great variation in outcomes indicates substantial unobserved heterogeneity. Looking at the rates of obtaining a basic educational qualification, the hypothesis is that individual traits of adolescents can buffer neighbourhood effects. First, adolescents with a more resilient personality may be better able to cope with neighbourhood adversity. And second, educational commitments might buffer adolescents from negative neighbourhood influences. These hypotheses are tested employing survival analysis, using six wave panel data, containing information on ten years of adolescents' lives. The results show that resilient experience no negative influence of neighbourhood disadvantage, while both undercontrollers and overcontrollers do. And, the stronger adolescents' educational commitments, the less they experience the negative effect of neighbourhood adversity. In sum, neighbourhood effects are found, but not for everybody.

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1. Introduction

Research on how the neighbourhood in which people live influences their social outcomes increased drastically over the past 25 years, and has led to a wide variety of mechanisms that may explain how neighbourhood effects work (Galster, 2011; Van Ham et al., 2011). However, despite this longstanding interest, the literature is still far from conclusive about the workings of the neighbourhood. Neighbourhood disadvantage has often been linked to individual educational outcomes, with mixed evidence, some finding large or small effects, while others are not able to establish any evidence for the influence of neighbourhoods on educational outcomes (for reviews, see: Dietz, 2002; Jencks and Mayer, 1990; Johnson, 2010; Leventhal and Brooks-Gunn, 2000). This variation in findings points at unmeasured individual characteristics. Heterogeneity of neighbourhood effects has for example been shown for individual characteristics such as being a parent or not, and being in part-time vs. full-time employment (Galster et al., 2010). Another example of characteristics that are commonly used to address diverging neighbourhood effects for different individuals pertains to the family context and the parents. Parenting

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strategies or parental stress have in some instances been indicated as a pathway between neighbourhood disadvantage and child outcomes (for a review, see: Galster, 2011), although this relation is not found consistently (Nieuwenhuis et al., 2013).

We, however, suggest two commonly unmeasured attributes that pertain more to the individual adolescent, which may lead to different findings in neighbourhood effects research: a resilient personality type and educational commitments. First, people with more resilient personalities might differ substantially in their ability to cope with adverse neighbourhood effects, and second, adolescents might be buffered from negative neighbourhood effects by higher levels of educational commitment. Resilience and educational commitment may explain why some research finds a neighbourhood effect, while others are not able to find significant links.

A second reason for the variation in the findings of neighbourhood effects is the definition of the neighbourhood. Some studies use the district level to measure effects, others take the analyses down to the level of streets or blocks. Smaller delineations are likely to better represent the individually perceived neighbourhood, and might better when a local socialisation mechanism is in effect. However, a larger delineation may be more suitable when the neighbourhood effect is caused by outside stigmatisation and reputation (Kwan, 2012; Oberwittler and Wikström, 2009). We will test which of the two is more apt in identifying neighbourhood effects on educational outcomes.

2. Theories and hypotheses

We consider two individual attributes that we hypothesise to interact with the neighbourhood effect: personality types and educational commitment. Our specific educational outcome is ‘the timing of obtaining a basic qualification’. This outcome enables us to develop hypotheses about study delay and school dropout. In the following we will first briefly discuss the neighbourhood effects literature on education, and subsequently we will hypothesise why personality type and educational commitment are likely to interact with this effect.

2.1. Neighbourhood effects

One of the important contexts for youth’s development is the neighbourhood in which they grow up, since a significant part of their developing years are spent in there. There is a continuing discussion in neighbourhood effects literature about the mechanisms through which neighbourhoods might influence its residents’ behaviour or attitudes (for extensive reviews, see e.g., Galster, 2011; Jencks and Mayer, 1990). Whether neighbourhood characteristics influence individual educational outcomes is also subject to debate, however, review articles seem to suggest that there is an effect of the neighbourhood (see e.g., Dietz, 2002; Jencks and Mayer, 1990; Johnson, 2010; Leventhal and Brooks-Gunn, 2000). Disadvantaged neighbourhoods are often marked by high levels of social disorder and low levels of residents’ ability to enforce norms (Sampson and Raudenbush, 1999). Besides, disadvantaged neighbourhoods with higher rates of unemployment have less positive adult role models showing the merits of education. Adolescents in such neighbourhoods are less likely to learn the importance of education (Ainsworth, 2002; Wilson, 1996). Furthermore, when negative attitudes towards education are normal amongst neighbourhood residents, residents are less likely to interfere when they see, for example, adolescents skipping school, since they maintain the same attitudes. While on the other hand, skipping school would not go unnoticed in neighbourhoods where people value education (Akers et al., 1979). This would mean that adolescents growing up in disadvantaged neighbourhoods are more likely to have negative attitudes towards education and behave accordingly, because they perceive less positive role models who could teach them the importance of education, and because they are less likely to be sanctioned in case of deviant behaviour. The hypothesis is that: *the higher the degree of disadvantage of the neighbourhood in which adolescents reside, the more delay they experience in obtaining a basic qualification (H1)*.

2.2. Personality types

Within the neighbourhood context, studies have already looked into the relationship between neighbourhood effects and personality traits, mainly within the field of criminology. Examples are that the effects of impulsivity on delinquency are found to differ between high and low disadvantage neighbourhoods (Lynam et al., 2000; Meier et al., 2008; Zimmerman, 2010); and furthermore that neighbourhood characteristics moderate the effect of low self-control on violent victimisation (Gibson, 2012), of hyperactivity, impulsivity, and attention difficulties on conduct problems (Zalot et al., 2009), and of thrill and adventure seeking and lack of premeditation on offending (Jones and Lynam, 2009). These studies suggest the importance of including personality measures in neighbourhood research. However, research on neighbourhoods and educational outcomes has thus far neglected this. Besides, aforementioned studies rely on personality traits, while we employ person-centred approach, using personality types. Personality types enable us to look at the differences between within-person configurations of a set of personality traits.

Studies on personality often distinguish three personality types: resilient, undercontrollers, and overcontrollers, which relate closely to the five broad personality dimensions of the Big Five (Caspi et al., 2005): extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience (McCrae and Costa, 1987). Earlier research has consistently shown that the personality types have specific Big Five personality profiles, and can therefore be constructed directly from the Big Five personality dimensions (Klimstra et al., 2010; Mervielde and Asendorpf, 2000; Robins et al., 1996). Resilients

score high on all five personality dimensions, and highest on extraversion, conscientiousness, emotional stability, and openness to experience. Overcontrollers score highest on agreeableness, but lowest on extraversion and emotional stability. Undercontrollers score lowest on agreeableness and conscientiousness.

The three personality types score differently on ego-control and ego-resiliency (Block and Block, 1980). Ego-control refers to the tendency to contain versus express emotional and motivational impulses, and ego-resiliency refers to the tendency to respond flexibly versus rigidly to environmental demands (Klimstra et al., 2010; Meeus et al., 2011). Resilients are characterised by medium levels of ego-control and high levels of ego-resiliency. Undercontrollers and overcontrollers both score low on ego-resiliency, however, undercontrollers are marked by low levels of ego-control, whereas overcontrollers are marked by high levels of ego-control (Asendorpf et al., 2001; Caspi, 1998).

Resilients, the personality type with the highest level of ego-resiliency and a medium level of ego-control, are the group that is likely to most effectively cope with neighbourhood disadvantage. Resilients can respond flexibly and adaptively on environmental demands, whereas overcontrollers and undercontrollers are less able to respond flexibly in stressful situations. Neighbourhoods can be more stressful and demanding environments when exhibiting characteristics as higher levels of poverty, higher levels of social and ethnic diversity, higher population density, lower social status, or lack of social control mechanisms. We expect the negative influence of neighbourhood disadvantage on adolescents' educational outcomes to be weaker for resilients, since they are better able to cope with the negative influence exerted by neighbourhood disadvantage, compared to overcontrollers and undercontrollers. Besides, faced with limited social control, overcontrollers and undercontrollers might be more inclined to be negatively influenced by deviant (neighbourhood) peers, while resilients might be better able to conform to the societal norm that education is important. In this respect it was found that overcontrollers are more likely to be influenced by the delinquency of their peers than resilient youth (Yu et al., 2013). Also, findings show that undercontrollers do less well in education (Asendorpf and Van Aker, 1999), and might therefore be more sensitive to the influence of neighbourhood disadvantage. Our hypothesis is that: *resilients experience a weaker effect of neighbourhood disadvantage on the timing of obtaining a basic qualification than do overcontrollers and undercontroller (H2).*

2.3. Educational commitments

Identity formation is suggested to be a key developmental task of adolescence (Erikson, 1972). We focus on one dimension of identity, namely commitment (Marcia, 1966). Commitment can be divided into making commitments and identification with these commitments. Making commitments refers to the degree to which adolescents have made choices in various developmental domains, and are committed to these choices (Meeus, 2011). Having commitments, however, is not the same as identifying with these commitments. Identification with commitments refers to the degree that adolescents identify themselves with, feel certain about, and internalise their commitments (Luyckx et al., 2006). Because our research focusses on educational outcomes, we specifically look at identification with commitments in the educational domain. We will refer to this as educational commitment.

Stronger educational commitments are found to be related to a lower likelihood for study delays (Klimstra et al., 2012) and a lower likelihood to drop out of school (Germeijs and Verschuere, 2007; Robbins et al., 2004). Besides, educational commitment is positively associated with the ability to adjust to the educational demands of the university (Luyckx et al., 2006), scholastic competences, work ethic and achievement motivation (Meeus et al., 2002). Educational commitments are likely to be associated with educational attainment, hence our hypothesis: *the stronger the individual educational commitments, the earlier the timing of obtaining a basic qualification (H3).*

The strength of an adolescent's educational commitments indicates the goals and values that an adolescent has set for his/her life. Living in a disadvantaged neighbourhood may have a negative influence on educational attainment, however, strong educational commitments might buffer the negative influence of the neighbourhood. Even when the neighbourhood provides poor role models and its residents hold negative attitudes towards educational attainment, adolescents with more educational commitment will strive for better educational attainment. They may therefore experience less negative neighbourhood influence compared to adolescents who are less committed to education. We hypothesise that: *adolescents with stronger educational commitments experience a weaker effect of neighbourhood disadvantage on the timing of obtaining a basic qualification than do adolescents with weaker educational commitments (H4).*

Personality and educational commitments are believed to be related concepts. The Big Five personality traits are found to be associated with commitments (Klimstra et al., 2012; Luyckx et al., 2006). To our knowledge, only Klimstra et al. (2012) studied educational outcomes by looking at personality traits and educational commitments at the same time. They found that educational commitment is positively associated with educational attainment, however, after adding the personality traits to the model, the association vanishes. Because we look at personality types (configurations of traits within individuals), we will assess whether testing personality types and educational commitment in one model has the same effect as one model with personality traits and educational commitment.

The two main hypotheses of this paper deal with the idea that the strength of the influence of neighbourhood characteristics on individual educational outcomes depends on individual traits; different people will experience a different neighbourhood effect. In this study we look at two individual traits in particular: a resilient personality (H2) and educational

commitments (H4). Using interaction-terms between the individual traits and neighbourhood disadvantage, we are able to test our hypotheses.

3. Data and methods

3.1. Data

To test our hypotheses we use several data sources. The six waves of the Conflict and Management of Relationships (Conamore) data are used for individual-level data. For neighbourhood-level information we use data from The Netherlands Institute for Social Research and Statistics Netherlands. The Conamore data are a longitudinal dataset consisting of 1,313 respondents divided into an early-to-middle adolescent cohort ($n = 923$; 70.3%) who were on average 12.4 years of age at the first wave, and a middle-to-late adolescent cohort ($n = 390$; 29.7%) with an average age of 16.7 years. Respondents were recruited from twelve high schools in the province of Utrecht, The Netherlands. The first wave was collected in 2001/02, and waves 1 through 5 were collected with a one year interval. The sixth wave was collected in 2009/10 and included an additional Life History Calendar (LHC) with retrospective questions from the age of 12 until the timing of the sixth wave. The total age range for the sample is 12–24 years of age. In waves 1, 2, 3, 4, 5 and 6 the number of respondents was 1313, 1313, 1293, 1292, 1275, and 1026, respectively. For the first five waves, sample attrition was very low (1.2% across waves). Attrition for the sixth wave is bigger (20%), because of the larger gap between wave five and six, compared to the one-year gap between the earlier waves. After listwise deletion of cases with missing values, our sample size is $N = 915$.

The Conamore data include all six-digit postcodes where the respondents lived between their twelfth year and the date of the data collection of the sixth wave. This offers the opportunity to combine postcode-level data with the individual-level data from the Conamore, enabling us to investigate the residential histories of the respondents. This neighbourhood-level data come from two sources. The Netherlands Institute for Social Research (SCP, 1998) provides information on four-digit postcode areas. Statistics Netherlands (CBS, 2006, 2011) provides data on six-digit postcode areas. Four and six-digit postcode areas are comparable in the sense that four-digit postcode areas are aggregations of six-digit postcode areas.

3.2. Dependent variable

The dependent variable is the timing of obtaining a basic qualification. A basic qualification in the Netherlands is defined as a qualification at the second level of senior secondary vocational education (*mbo-2*), senior general secondary education (*havo*), pre-university education (*vwo*), which are the minimal educational requirements for finding a job (CBS, 2012). Individuals who do not obtain a basic qualification before leaving school are considered early school leavers. We use the timing of obtaining a basic qualification as a measure for study delay. Respondents filled in the month and year of obtaining the qualification in the LHC, which we used to determine the timing of obtaining the qualification. Respondents who did not obtain a basic qualification at the time when wave 6 was collected are considered not to be right-censored (10% of the sample).

3.3. Independent variables

To measure neighbourhood disadvantage we constructed two scales: one delineated as a four-digit postcode area (1500 households) and one as a six-digit postcode area (17 households). The three measures used to create the four-digit postcode scale are obtained through The Netherlands Institute for Social Research. First, status scores of neighbourhoods are a ranking order of Dutch postcode areas based on income, job availability, and educational level, and are measured for the years 1998, 2002, 2006, and 2010. Higher status scores means a better neighbourhood, therefore this variable was reverse coded. Second, the Residential Environment Database (*Woonmilieudatabase*) provides the proportion of residents receiving housing benefits, and third, the proportion of students with a learning disability, both measured for the year 1997. The four measures used to create the six-digit postcode scale are obtained through Statistics Netherlands. First, we use a measure for the address density of the surrounding area, as a measure for urbanisation, and second the proportion non-Western immigrants in the neighbourhood, both measured for 2010. Third, we use a measure for the average property value (reverse coded), and fourth, an average fiscal income measure (reverse coded), both measured for 2004. All seven neighbourhood characteristics were standardised and constructed into the two scales that capture the degree of neighbourhood disadvantage. We ran factor analyses for both groups of variables, both of which clearly showed one factor. Internal validity for both scales was high: Cronbach's $\alpha = .88$ for the four-digit postcode area and Cronbach's $\alpha = .72$ for the six-digit postcode area. Of all respondents, 28% moved at least once, therefore, neighbourhood disadvantage is time-varying and changes when respondents move. So, for every unit of analysis (months), respondents are analysed within the right neighbourhood. In must be noted that the correlation between moving and neighbourhood disadvantage is very low, so it is unlikely that the results will be influenced by residents from certain neighbourhood moving more often than residents from other neighbourhoods.

To construct personality types, we first needed to assess personality dimensions, which were measured with a shortened Dutch version of the Big Five questionnaire (Gerris et al., 1998; Goldberg, 1992). This questionnaire contains 30 items, such as talkative (extraversion), sympathetic (agreeableness), systematic (conscientiousness), worried (emotional stability),

reverse coded) and creative (openness to experience). The adolescents could respond ranging from 1 (completely true) to 7 (completely untrue). For the early-to-middle adolescent cohort we assessed personality at age 14 and for the middle-to-late adolescent cohort at age 16 (their earliest measurement point).¹ Cronbach's α s for the Big five scales ranged from .75 to .86. To assess the personality types (resilients, overcontrollers, undercontrollers), we used Latent Class Analysis (LCA), which detects latent classes of the most typical configurations of the five personality dimensions within persons. The distribution of personality dimensions across different personality types we found corresponds to earlier research (Klimstra et al., 2010; Robins et al., 1996). Resilients ($n = 364$) score high on all five personality dimensions, and highest on extraversion, conscientiousness, emotional stability, and openness to experience. Overcontrollers ($n = 515$) score highest on agreeableness, but lowest on extraversion and emotional stability. Undercontrollers ($n = 37$) score lowest on agreeableness and conscientiousness. The three personality types were recoded into dummies.

Previous studies have often measured educational commitment as a mix of identification with commitment and making commitments (e.g., Germeijs and Verschueren, 2007; Robbins et al., 2004). In line with Klimstra et al. (2012) we considered identification with commitment as a separate dimension of commitment. Educational commitments were assessed using the Utrecht-Management of Identity Commitments Scale (U-MICS; Crocetti et al., 2008), which consists of five items to measure the degree to which adolescents derive self-confidence from the education choices they made, with response categories 1 (completely untrue) to 5 (completely true). Sample items are: "My education makes me feel confident about myself" and "My education gives me certainty in life". We constructed scales for educational commitment for all six waves, which all had high reliability (Cronbach's α s .90–.93). Finally, we made one time-varying variable for educational commitment, with changing values at the timing of new waves.²

3.4. Control variables

We control for gender, age, parental support, parental ethnicity, parental education, family structure, residential mobility, and educational level at the age of 13. Gender is a dummy with 'female' coded as 1. Age is measured in months and is time-varying. Age was standardised.

Parents can support the development of their children's educational attitudes by being available, by being involved in school and showing interest in school-related activities (Astone and McLanahan, 1991; Clark, 1983; Coleman, 1988; McNeal, 1999). We control for this in order not to misrepresent the effect of educational commitment. Parental support was measured using the Network of Relationship Inventory (NRI) (Furman and Buhrmester, 1985). The NRI has reported adequate validity (Edens et al., 1999). The questions are asked separately about the father and the mother and uses answering categories that range from 1 (little or not at all) to 5 (more is not possible). The support scale consists of 12 items from different subscales of the NRI, such as companionship, instrumental aid, intimacy, nurturance, affection, admiration, and reliable alliance. Examples of items are: "Do you share secrets or personal feelings with you father/mother?" and "Does your father/mother appreciate the things you do?" Across waves, the Cronbach's α s range from .87 to .92. We combined the scales for fathers and mothers in one scale in order to obtain an overall, time-varying measure of parental support.

Parental ethnicity is a dummy and is 1 when both parents are non-Dutch born. Parental education is measured in a set of seven dummy variables, including: (1) lower vocational education or lower; (2) preparatory middle-level vocational education; (3) middle-level vocational education; (4) higher general continued education or preparatory scientific education; (5) higher vocational education; and (6) scientific education. Family structure is a time-varying dummy measuring not living with both parents. This includes: living with one parent; living with a parent and a stepparent; living alone; or a different situation. Residential mobility is a time-varying dummy measuring whether the respondent moved residence at least once. Educational level at the age of 13 is captured in three dummies: (1) preparatory middle-level vocational education (*vmbo*); (2) higher general continued education (*havo*); and (3) preparatory scientific education (*vwo*). Educational level at the age of 13 is important, because different high-school trajectories require different time investments (four, five, and six years respectively). And because our dependent variable is the timing of obtaining a basic qualification, not including this control variable would obscure the results.

¹ We wanted to measure personality at an early age, since a basic qualification (our dependent variable) is usually obtained between the ages 17 and 19. Age 16 is too close to the age of obtaining the basic qualification. In additional analyses where we measured personality types at age 16 for both cohorts we did not find a significant interaction term. Also, a separate analysis for the older cohort with personality at age 16 did not show a significant interaction term. The analysis restricted to the younger cohort measured at age 14 did show a significant result. We also measured personality types at ages 13 and 15 for the younger cohort, with which we find the same results as with age 14, when analysing the total sample. Measuring personality at an earlier age allows us to assess the impact of personality on educational attainment. Measuring it at a later age would mean that our measure for personality cannot be used to say much about the educational trajectory that happened before it was measured. This problem is now minimised. We maintain the older cohort to increase the sample size, but it should be noted that the results for personality are mainly driven by the younger cohort, indicating that it is the personality during the early adolescent life that counts when assessing the buffering effect of personality on neighbourhood disadvantage.

² We consider educational commitment as a moderator variable in the relationship between the neighbourhood and educational attainment, however, it might be that educational commitment is influenced by neighbourhood disadvantage through collective socialisation processes and role models. If this is true, it means that educational commitment might be a mediating variable between neighbourhood disadvantage and educational outcomes, which might bias our results. We tested this with a correlation, checking whether there is an overlap between the level of educational commitment and the degree of neighbourhood disadvantage. At $t = 1$ (respondents' age 12) we find a small but significant correlation ($\rho = .067, p = .045$). However, most correlations after $t = 8$ (age 12 years and 7 months) are insignificant. We do not expect problems for our analyses, especially since the correlation disappears after a short time, but it must be noted that a small selection bias is possible.

Table 1Accelerated failure-time Weibull models on the timing of obtaining a basic qualification for different neighbourhood delineations ($N = 915$).

	Four-digit postcode area	Six-digit postcode area
	coef. (s.e.)	coef. (s.e.)
Neighbourhood disadvantage (pc4)	0.03 (0.01)**	
Neighbourhood disadvantage (pc6)		0.06 (0.01)**
Log likelihood	–156.33	–144.60

Note: The models include the following variables: personality types, educational commitment, gender, age, parental ethnicity, family structure, parental support, parental education, educational level at age 13, and residential mobility.

* $p < 0.05$.

** $p < 0.01$.

3.5. Method

To test our hypotheses, we use survival analyses (Allison, 1995). We transformed our data into person-month data, where the first month is the month that the respondent turns 12 years old and the last month is the month of obtaining a basic qualification or, when no basic qualification is obtained, the month of the sixth wave data collection. This data structure allows for variables to vary over time, which in our case means at the timing of the six waves, and at the timing of events reported in the LHC (for example, the year and month in which the basic qualification was obtained is reported in the LHC). Using a global χ^2 test, we found that the proportionality assumption was violated ($\chi^2 = 112.90$; $p = .000$), indicating that a proportional hazards model is not suitable. Instead, we used accelerated failure-time (AFT) Weibull models. The coefficients in these models show how a covariate affects the expected survival time, where positive coefficients mean a longer duration before the event (i.e., obtaining a basic qualification) and vice versa.

The respondents were recruited from twelve high schools, so it is possible that there are within-school correlations in educational outcomes. To account for this, we estimated an additional shared-frailty model which includes a frailty which is shared amongst the students of the same school (Gutierrez, 2002). However, the likelihood-ratio test comparing the model with within-school correlation with the model without it proved to be insignificant ($\chi^2_1 = .90$; $p = .171$), so we dropped the frailty to keep the model more parsimonious.

4. Results

To test whether there are differences in individual educational attainment between neighbourhoods with different degrees of disadvantage, we perform a simple log-rank test of equality for survivor functions. We divided neighbourhoods in two groups according to their degree of disadvantage (less than or equal to the mean level of disadvantage, and more than the mean level of disadvantage). This test supports the idea that adolescents in disadvantaged neighbourhoods have less educational success (i.e., less often obtain a basic qualification) ($\chi^2 = 23.20$; $p = .00$). Also, when comparing survivor rates for the two groups of neighbourhoods, we find that at the age of 20, 14% of the adolescents in less disadvantaged neighbourhoods has yet to obtain a basic qualification, while for the adolescents in more disadvantaged neighbourhoods this is 25%.

To test which neighbourhood delineation is most suitable for our analyses, we run two models, one for the four and one for the six-digit postcode area delineation (Table 1). We see that disadvantage measured on a larger scale (pc4) renders a weaker effect on the individual timing of obtaining a qualification³, while the smaller delineation (pc6) shows a significant effect. This is in line with previous research on neighbourhood delineations, who found that smaller delineations provide with better results, and besides that, are theoretically more likely to represent the individually perceived neighbourhood (Andersson and Musterd, 2010; Oberwittler and Wikström, 2009). For the purpose of our analyses, we continue the analyses with the six-digit postcode area delineation.

Looking at the model without interaction terms (see Table 2: M1), we first see a positive effect of neighbourhood disadvantage on the timing of obtaining a basic qualification, meaning that the duration to obtain a basic qualification is longer for adolescents in disadvantaged neighbourhoods compared to adolescents living in more advantaged neighbourhoods. This finding is supportive of our first hypothesis. Furthermore, we see that adolescents with different personality types do not score differently on obtaining a basic qualification. We also see that adolescents with stronger educational commitments are more likely to need less time to obtain a basic qualification, which is in line with our third hypothesis.

The main focus of this paper is to test whether adolescents with different individual traits are influenced differently by the neighbourhood. To test this we interact neighbourhood disadvantage with personality types (H2) and educational commitment (H4). First, the interaction effect between neighbourhood disadvantage and resilients is negative (Table 2: M2). This means that resilients experience less negative influence from neighbourhood disadvantage. Moreover, the interaction coefficient and the coefficient for neighbourhood disadvantage are almost equal of size, suggesting that resilients experience no neighbourhood effect, while overcontrollers and undercontrollers do. This last point is supported by two additional analyses

³ We also conducted analyses with the pc4 measure of neighbourhood disadvantage including the interaction terms with resilients and educational commitment. These were not significant.

Table 2Accelerated failure-time Weibull models on the timing of obtaining a basic qualification ($N = 915$).

	M1	M2	M3
	coef. (s.e.)	coef. (s.e.)	coef. (s.e.)
Neighbourhood disadvantage (pc6)	0.06 (0.01)**	0.08 (0.02)**	0.20 (0.03)**
Personality types (ref.: overcontrollers)			
Undercontrollers	−0.01 (0.05)	−0.02 (0.05)	−0.02 (0.05)
Resilients	0.01 (0.02)	0.00 (0.02)	0.01 (0.02)
Educational commitment	−0.08 (0.01)**	−0.08 (0.01)**	−0.08 (0.01)**
Neighbourhood disadv. × resilient		−0.05 (0.02)*	
Neighbourhood disadv. × educ. commitment			−0.05 (0.01)**
Gender (female)	−0.01 (0.02)	−0.01 (0.02)	−0.00 (0.02)
Age	0.00 (0.01)	−0.00 (0.01)	0.00 (0.01)
Parental ethnicity (non–Dutch)	0.01 (0.03)	0.00 (0.03)	0.02 (0.03)
Family structure (ref.: with both parents)			
Not with both parents	−0.02 (0.02)	−0.03 (0.02)	−0.02 (0.02)
Parental support	−0.02 (0.01)	−0.02 (0.02)	−0.01 (0.01)
Parental education (ref.: scientific education)			
Lower vocational education or lower preparatory middle-level voc. educ.	0.05 (0.03)	0.05 (0.03)	0.05 (0.03)
Middle-level vocational education	0.08 (0.02)**	0.09 (0.02)**	0.08 (0.02)**
Higher general continued education or preparatory scientific education	0.04 (0.02)	0.04 (0.02)	0.04 (0.02)
Higher vocational education	−0.03 (0.02)	−0.03 (0.02)	−0.04 (0.02)
Educational level at 13 (ref.: vwo)			
Vmbo	0.05 (0.02)*	0.05 (0.02)*	0.05 (0.02)*
Havo	0.19 (0.03)**	0.19 (0.03)**	0.19 (0.03)**
Residential mobility	0.04 (0.02)*	0.04 (0.02)*	0.04 (0.02)*
Intercept	0.13 (0.02)**	0.13 (0.02)**	0.12 (0.02)**
Shape (p) ^a	4.64 (0.05)**	6.65 (0.05)**	6.64 (0.05)**
Log likelihood	4.70 (0.16)**	4.67 (0.16)**	4.74 (0.16)**
LR χ^2 (df) ^b	−144.60	−141.80	−136.22
		5.60 (1)*	16.76 (1)**

^a A shape parameter greater than 1 indicates an increased hazard of an event (i.e., obtaining a basic qualification) with time.

^b Likelihood-ratio tests compare models 2 and 3 with model 1.

* $p < 0.05$.

** $p < 0.01$.

restricting the sample to only resilient or only overcontrollers and undercontrollers. For the first we find no significant neighbourhood effect, while for the latter we do. This finding is in line with our second hypothesis.

Second, the interaction effect between neighbourhood disadvantage and educational commitments is also negative (Table 2: M3), suggesting that adolescents with stronger educational commitments experience less negative influence of neighbourhood disadvantage. This finding is supportive of our fourth hypothesis. Compared to the model without interactions, the size of the coefficient for neighbourhood disadvantage increases ($b = .20$). The size of the interaction effect is $-.05$, and since educational commitment is measured on a scale from 0 to 4, adolescent with the highest educational commitment level are unlikely to experience any neighbourhood effect on the timing of obtaining a basic qualification (i.e., $b = .20 + (4 \times -.05) = 0.00$).

5. Conclusion and discussion

The principal aim of this paper was to investigate whether adolescents with different individual traits experience different neighbourhood effects. The main neighbourhood effect we found is that: adolescents residing in disadvantaged neighbourhoods are more likely to need a longer time to obtain a basic qualification than adolescents residing in more advantaged neighbourhoods (H1). Although this finding is not novel, it allows us to test our hypotheses about diverging neighbourhood effects for adolescents with different individual traits. We looked at two individual traits: personality types and educational commitment.

First, we hypothesised that adolescents with different personality types cope differently with neighbourhood adversity, and therefore experience different neighbourhood effects on their educational outcomes. More specifically, we hypothesised that resilient experience a weaker effect of neighbourhood disadvantage than overcontrollers and undercontrollers (H2). Our analyses support this hypothesis, and interestingly enough, it seems that resilient might experience no influence of neighbourhood disadvantage on educational attainment. Overcontrollers and undercontrollers, however, do experience a negative influence of neighbourhood disadvantage on the timing of obtaining a basic qualification.

Second, we looked at how adolescents with different degrees of educational commitment differ in how they experience the influence of the neighbourhood on their educational outcomes. We hypothesised educational commitment to buffer the negative effect of neighbourhood disadvantage (H4). Also this hypothesis is supported by our data. We find that adolescents

with low levels of educational commitment who live in disadvantaged neighbourhoods experience a stronger negative influence of neighbourhood disadvantage compared to other adolescents in the neighbourhood, who have high levels of educational commitment. Furthermore, our analyses suggest that adolescents with the highest level of educational commitment are not or hardly affected by neighbourhood conditions.

These findings provide implications for policy makers who target neighbourhood disadvantage with the goal to promote social mobility amongst the neighbourhood's residents. Disadvantaged neighbourhoods might indeed hinder the social mobility of its residents, however, focussing on the neighbourhood as a whole (e.g., social-mix policies, Galster, 2007; Kleinhans, 2004) might turn out to be inefficient, and ignores the individual differences between people. When adolescents' personalities and educational commitments are known (for example, through school-based assessments), person-specific policies can more specifically target the adolescents who are most likely to be susceptible to be negatively influenced by neighbourhood disadvantage. Less investment might be needed for adolescents with resilient personalities or strong educational commitments. It might be beneficial to expose more susceptible adolescents to more positive stimuli, both in schools as well as in neighbourhoods. Such policies may counter negative neighbourhood influences, and also be more effective in targeting those who are at risk.

An important main effect we found is that stronger educational commitments lead to an earlier timing of obtaining an educational qualification (H3). Because we simultaneously tested educational commitments and personality we were able to see whether there is an effect of educational commitment when both are in the model, as was refuted by earlier research (Klimstra et al., 2012). Contrarily, we do find an effect of educational commitment. We can explain this divergence by pointing out that, instead of personality traits, we used personality types. The personality trait of conscientiousness shares some overlap with educational commitments, so when taken apart, it might be difficult to assess the effect of educational commitment. Because we looked at configurations of the Big Five personality traits within persons, the effect of commitment remains, suggesting that personality types and educational commitment do not necessarily overlap.

We also tested the influence of the scale of the neighbourhood. We delineated neighbourhood disadvantage on a larger and a smaller scale, and found a stronger effect for the small delineation. Considering the theories on collective socialisation and role models in the neighbourhood, our findings suggest that residents exert more social influence on small geographical scales. Large scale delineations of the neighbourhood seem less appropriate when looking at educational outcomes. It would be interesting for future research to look deeper at issues of scale. But more importantly, this finding emphasises the notion (Galster, 2001) that neighbourhood researchers should be concerned about how their neighbourhood delineation relates to the questions they want to answer.

Neighbourhood research is often faced with selection bias (Galster, 2008), i.e., that families sort into neighbourhoods according to their preferences and economic constraints. When individual characteristics that determine both neighbourhood choice and educational attainment are omitted from the analyses, effects may spuriously be ascribed to the neighbourhood, while actually they pertain to unmeasured individual characteristics. However, because our sample consists of adolescents, the neighbourhood choice is exogenous, since it is made by their parents. Therefore, it is less likely that unmeasured characteristics of the adolescents determine both neighbourhood choice and educational attainment. However, there may be an indirect selection issue through parental characteristics. Parental characteristics may influence both neighbourhood choice and characteristics of the adolescent. We partly dealt with this by controlling for parental ethnicity, family structure, parental support and parental education. It should, however, be kept in mind that selection might still bias our neighbourhood effect.

In conclusion, we can say that it is very likely that adolescents with different individual traits are differentially susceptible to neighbourhood effects on educational attainment. To our knowledge, neighbourhood effects research and research on personality and educational commitments has not been combined thus far. However, as our results show, personality and educational commitments are strongly related to the magnitude of the neighbourhood effect. Our findings lead to new questions: Do personality and educational commitments operate in the same way for neighbourhood effects on other individual outcomes, for example, income or deviant behaviour? And, are there other individual traits that lead to diverging neighbourhood effects, for example confidence or ambition? One study also pointed at the use of integrating genetic susceptibility into neighbourhood research (Tuvblad et al., 2006), a promising path that might shed more light on heterogeneity of neighbourhood effects. In any case, our findings require future neighbourhood research to consider individual differences with more caution, in order to avoid misspecifications and overgeneralisations.

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