UNDERSTANDING AND INFLUENCING PUPILS' CHOICES AS THEY PREPARE TO LEAVE SCHOOL

EXECUTIVE SUMMARY

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Background and Aims

Non-Shared Environmental (NSE) factors explain one-fifth of individual differences in GCSE achievement; almost half of the differences in self-reported life satisfaction; and three-quarters of individual differences in future orientation (ability to envision and plan for the future). NSE factors are those that affect siblings growing up in the same home differently, even monozygotic (MZ) twins who are genetically identical. This may be because they are objectively non-shared (e.g. different friendship groups or hobbies) or because they are experienced differently (e.g. different reactions to parental divorce). We know how much variance NSE explains but very little about the actual experiences involved.

This study therefore aimed to generate new hypotheses about what these experiences might be for adolescents nearing the end of their compulsory education. Phase 1 involved gathering qualitative data from twins and their parents about what they perceived as important experiences that were different for individual members of a twin pair. Phase 2 drew upon the rich data gathered during Phase 1 to develop and test a new quantitative measure of NSE experiences in Year 11.

We know that the end of Year 11 is an important transition point for young people, where their behaviour has significant real-world implications. Our hope was that by understanding which environmental factors can make a difference at this age we might be able to develop new ways of providing pupils with optimal support to flourish. The sharpest tool we have for identifying NSE influences involves looking at differences between MZ twins, so that is where we began.

Our Research Questions

1. Which experiences in school and elsewhere influence young people as they reach the end of their compulsory education?

2. Do these environmental factors differ between groups based on socio-economic status (SES), gender or general cognitive ability?

3. Could these environments be used for the benefit of more young people as they prepare to make the transition out of compulsory education?

Qualitative Findings

Study Design

Unlike other siblings, MZ twins are identical genetically, which means that differences in experiences within MZ twin pairs can only be caused by NSE. We gathered free-response questionnaire data from 497 pairs of MZ twins (61% female; average age = 17.3) and, in most cases, a parent. Twins and their parents were asked to describe and explain any notable differences between them in their own words. We then went on to interview 97 families with particularly discordant pairs to explore their responses in greater depth. All participants were drawn from the Twins Early Development Study (TEDS). TEDS is a longitudinal study of twins born in the UK between 1994 and 1996.

Findings: Achievement at GCSE (General Certificate of Secondary Education)

- Sixty-five of 497 families reported a discordance of 2+ grades in one or more GCSE subjects (56 of these families were interviewed).
- Explanations for discordant GCSE achievement tended to relate to perceived discordance in the school environment or in individual traits/behaviour.
- The school environment factors identified were ability grouping, perceived teacher quality and perceived teacher-pupil relationships.
- Many families attributed discordance in achievement to discordance in effort, ability, personality and interest. Although these aspects of behaviour are not the 'environmental' explanations we sought it is important to note that MZ discordance in them must have NSE roots.
- Families explained discordant effort in terms of the influence of peer relationships, having a plan for the future and the twin relationship.
- Few environmental explanations were offered for discordance in ability, personality or interest.

Findings: Peer Relationships

- Within-pair discordance in peer relationships was described by 112 families. This discordance fell into six types: peer victimisation (15), peer rejection (7), fewer friends for one twin (39), different friends (23), different attitudes to friendship (23) and dependence on co-twin (5).

- Discordant peer victimisation and rejection were seen by families as being caused by (a) chance or (b) enhanced vulnerability in one twin.
- Discordance in peer victimisation or rejection was believed to lead to discordance in self-confidence, social isolation, future plans and mental health, with more negative outcomes for the victimised or rejected twin.
- Of the 39 families who reported one twin as having fewer friends than the other, seven were happy with this situation and saw it as a good fit for their individual personalities and preferences.
- In the remaining 32 families having fewer friends (being less popular) was viewed as a negative experience, usually triggered by discordance in behavioural factors such as personality, confidence and self-esteem.
- Perceived consequences of having fewer friends than an identical co-twin were greater social isolation, discordance in future plans (less ambitious for the less popular twin) and lower self-confidence.
- Being exposed to different peers and making different friends – on the basis of either choice or chance – was seen as influencing personality, confidence, interests and social life.
- The remaining themes were behavioural (different attitudes to friendship and dependence on co-twin) rather than environmental, although they too must have NSE roots.

Quantitative Findings

We used our qualitative data as the basis for developing a new measure: SENSES (Student Experiences of Non-Shared Environment Scales) which we administered to 926 pairs of MZ and DZ twins (53% MZ; 61.9% female; M age = 18.4). We had GCSE data for most families and gathered new data on life-satisfaction and future orientation.

SENSES is a 49-item, 10-factor measure which we found to be reliable and valid in the current sample. However, further validation in other contexts is required. Factors included perceptions of teachers, perceptions of self, effort, social media use, influence of family, influence of work experience and confidence about future plans.

Findings: SENSES

- Individual differences in SENSES factors were, to a large extent, explained by NSE (estimates ranged from 45% for effort to 65% for perceptions of Maths teachers).
- SENSES factors correlated with GCSE achievement, life-satisfaction and future orientation, but associations were largely mediated by shared genetic effects rather than shared NSE effects.
- The strongest NSE mediation was seen between (a) perceptions of self and GCSE achievement, and (b) self-confidence about the future and life satisfaction.
- SENSES factors explained little variance in future orientation.

Findings: Group Differences

- Statistically significant sex differences were observed for self-reported effort (higher for girls) and self-confidence (higher for boys). Although significant, effect sizes were negligible.
- There was a significant but very small SES difference in self-reported effort, with pupils from low SES backgrounds reporting lower levels of effort.
- Pupils with higher general cognitive ability reported higher levels of effort, more confidence in their own ability to do well in Science, and more positivity about their Maths teachers.

In Summary

1. Which experiences in school and elsewhere influence young people as they reach the end of their compulsory education?

   Our combined qualitative and quantitative data suggested that factors including perceptions of teachers and perceptions of self may be important correlates of GCSE achievement. For the most part, these factors were associated with achievement for genetic rather than environmental reasons. However, links between perceptions of self and GCSE achievement, and self-confidence about the future and life satisfaction, were substantially explained by shared NSE effects. These represent good avenues for future research. Effort was also linked to achievement and NSE explanations offered for discordant effort within monozygotic twin pairs included peer relationships and future plans. Problematic peer relationships emerged as a potentially important NSE correlate of self-confidence, mental health and socialisation.

2. Do these environmental factors differ between groups based on SES, gender or general cognitive ability?

   SES and sex differences in the SENSES factors tended to be statistically significant but very small in terms of their effect size. Slightly larger effects were observed for groups based on general cognitive ability (g) in which higher g was associated with higher levels of effort, self-confidence and positivity about teachers, particularly in Maths and Science. Our study was unable to untangle direction of effects due to its correlational design.

3. Could these environments be used for the benefit of more young people as they prepare to make the transition out of compulsory education?

   It remains unclear whether and how we can influence pupils' choices and behaviour at this important developmental stage but our study has identified key areas for discussion and further exploration. Many of the factors identified were not truly 'environmental'. Rather, they were behavioural traits that could partly be explained by environmental influences. Further research is needed to understand the aetiology of these traits. In particular, the current study suggests that a detailed anatomy of effort, with a specific focus on NSE influences on effort and shared environmental influences on the relationship between effort and achievement could be very valuable.

Questions for future research arising from the current study

- Do perceptions of teacher quality and the teacher-pupil relationship influence current and future academic achievement?
- Which NSE factors are common to perceptions of teachers and academic achievement?
- Should pupils be able to choose their teachers?
- Can behavioural traits such as self-confidence be boosted by responding to problematic experiences of friendship in new, targeted ways?
- Can academic achievement (and/or life satisfaction) be improved by using NSE levers to boost self-confidence/self-efficacy?
- What NSE factors can explain individual differences in future orientation? (Current data suggest peer relationships – not included in SENSES – may be one factor.)
- Which are the shared environmental factors that influence effort and mediate associations between effort and achievement?
- Is the SENSES measure reliable and valid in other samples and populations?
- Would a peers-focused version of SENSES yield useful insights?

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