

# Steering with others in mind

## *The impacts of day and boarding education on the cognition of social agility and cohesion*

SHORT PAPER

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### Key words:

Social mobility, graduate employability, steering cognition, state education, private education, boarding education, communitarian, social cohesion

### Abstract

Mind.World short papers present findings from our research studies within a succinct literature context. This paper describes research to measure whether there are detectable non-cognitive skills differences between pupils educated in boarding, state day and independent day schools which may contribute to the persistence of divergent professional and societal status between those groups. A kind of cognition, steering cognition, is used as a means of defining the non-cognitive capacity being measured. A measure of steering cognition attributable to the three different types of school is described. A study to measure the ability to adjust this capacity of 3,883 pupils from 20 boarding, state day and independent day schools is described. Results indicate that boarding pupils have consistently more socially-emotionally responsive steering cognition across a variety of relevant scenarios. The origins of this increased capacity lie within the boarding house experience. The implications of this for professional and social success beyond school are discussed.

### Highlights

- Steering Cognition is a means of measuring non-cognitive skills which are likely to contribute to differences in social and professional success beyond school
- Using this measure, state day, boarding and independent day school pupils are compared
- Boarding pupils exhibit a greater level of regulation, associated with improved social fluency and emotional sensitivity
- This has implications both for pastoral care as well as future professional success and may contribute to greater population social mobility and social cohesion
- Approaches by which non-boarding schools can cultivate this capacity are explained.

## 1. Declining social mobility despite rising academic standards

Arguably, education is intended to provide the pathway by which any hard working young person can reach a job and position in society beyond their origins. Education is meant to increase social mobility. However, a slew of research over recent years has indicated that social mobility in the UK is declining rather than increasing (Shaheen 2014; Social Mobility Child Poverty Commission 2014). And the UK is not alone. Similar results have emerged from India, USA and South Africa. Social and professional territories occupied by a social elite have become more defended and less easy to penetrate than they were thirty years ago (Sutton Trust 2012).

In its 2014 report *Elitist Britain? The Social Mobility and Child Poverty Commission* tied social and economic inequality to educational background, arguing that a disproportionate number of elite roles in industry, government and society were held by those from a private school education (Social Mobility Child Poverty Commission 2014, 2014).

And yet, there is an mystery here: Over the same period that social mobility has been declining in the UK, the gap in educational grades between those educated in fee paying private schools and those in the best state schools has been getting narrower. One indication of this, according to Richard Adams of the Guardian newspaper, is that in 1986 just 10 state schools were included in the Good Schools Guide; that figure in 2015 has risen to 300 schools, 25% of all schools included (Adams 2016). The *solution* to improved social mobility was meant to be education, but improvements in education have not led to increases in social mobility.

Whilst many of the cited commentators have looked at the economic and societal networking advantages pupils from fee paying schools pay enjoy, this study will ask whether there is evidence of any acquired psychological advantages obtained through the private sector educational route, as opposed to the state day route. Do pupils from private schools develop social, emotional or cognitive skills not currently measured by academic assessments which contribute to them securing more elite roles in industry and society upon leaving school?

## 2. Measuring non-cognitive skills

The term ‘non-cognitive skills’ has been used to refer to a broad range of abilities which may be cultivated by education which are not measured by school assessments and exams. Into this broad bucket have been placed emotional and social skills, character values and qualities, mindset, cultural skills and abilities, musical, artistic and sporting skills. The breadth of the terms lumped together indicate that a lack of clear definition of the actual cognitive capacity being referred to. In this study, we will describe a specific kind of cognitive capacity called ‘steering cognition’ as our measure of non-cognitive skill.

Walker and Walker have coined the term ‘[steering cognition](#)’ to describe how the brain biases attention toward specific stimuli whilst ignoring others, before coordinating responsive actions which cohere with our past patterns of self-representation. According to the [Wikipedia article of steering cognition](#), the analogy of the car is sometimes used to explain steering cognition. As the ‘controls of our mind’, steering cognition regulates the mind’s direction, brakes and gears. Studies have shown that it is distinct from the ‘engine’ of our mind, sometimes referred to as ‘algorithmic processing’, which is responsible for how we process complex calculations (Walker 2015f; Stanovich, West 2014, 2008; Stanovich 2011; Evans 2011). In a series of large studies in the UK, Walker and Walker evidenced the effects of steering cognition upon pupil mental health and academic outcomes (Walker 2015f, 2016; Walker, Walker 2016).

Steering cognition, is proposed as a valid means of calibrating the non-cognitive characteristics of a population of pupils which can be attributed to the influence of the school environment. The aspects of the mind regulated by steering cognition include the *non-cognitive: the emotional, or affective; the social as well as the cognitive* and extend beyond the classroom to wellbeing, and social relationships. For example, steering cognition has been shown to be reliable indicator strong and weak mental health providing a bedrock for healthy emotional functioning and good social competencies (Walker 2015; Walker 2015a, 2015b, 2015c, 2015d, 2015e, 2015e).

Steering Cognition should be understood as a cognitive mechanism by which an individual self-regulates. Self-regulation has been defined as the ability to flexibly activate, monitor, inhibit or adapt one’s non conscious,

automatic affective-social strategies in response to direction from internal cues, environmental stimuli or feedback from others, in order to bring about an intended outcome (Rothbart et al. 2000a; Demetriou 2000; Eisenberg N. et al. 2006). Research into the development of self-regulation in children and adolescents has grown exponentially over the last fifteen years. A swathe of evidence identifying self-regulation as a foundational developmental skill which underpins future affective, social and academic competence (Vohs et al. 2008); in contrast, poor self-regulation has been found to correlate with a wide range of internalising and externalising difficulties (Eisenberg et al. 2000; Blair 2002; Trentacosta, C.J., & Shaw, D.S. 2009; Tangney et al. 2004). Self-regulation is often effortful, volitional, conscious and purposeful (Eisenberg et al. 2000; Eisenberg et al. 2010; Hofer et al. 2010; Rothbart, Bates 2007; King et al. 2013, Bauer, Isabelle, M., Baumeister, Roy, F. 2011, 2011), and is sometimes described as effortful control.

Correspondingly, pupils with *less steering cognition bias* are more likely to *read* the particular situation, encounter or context; they notice extrinsic and intrinsic cues which lead them to purposefully choose a particular affective-social response (Rothbart et al. 2000b; Eisenberg et al. 2000; Halberstadt et al. 2001; Tangney et al. 2004) i.e. exhibit greater self-regulation. By contrast, pupils who develop a *polar steering cognition bias* are less likely to notice those extrinsic and intrinsic cues; they tend to iterate the same self-strategies again and again which further reinforces their bias. These pupil can be said to have poor self-regulation; poor self-regulation predisposes them to a number of incipient risks (Eisenberg et al. 2003; Sallquist et al. 2009; Simonds et al. 2007).

The rationale behind this proposal is that psychological differences attributable to educational school type will be detected in differences in the regulation of steering cognition between those school populations. Previous studies have shown that inter-school cultural differences can be detected by steering cognition differences: For example, schools with formal, uniform and more controlling pedagogies have been shown to reduce the variance of steering cognition displayed by the pupils (Walker 2014 h.).

In this study, the influence of three types of school upon pupil steering cognition were studied. The study involved 11 secondary boarding schools, 5 secondary independent day schools, and 4 state day schools. Total n = 3883 pupils (36% boarding, 27% independent day, 37% state day. Age means were between 14.9 and 15.4 years, with 43% of the same being under 15, 38% between 15 and 16, and 19% between 17 and 19 years of age. 58% were boys and 42% were girls. Schools were selected to represent a distribution of academic ranking from those amongst the highest ranking in the UK, to schools in the mid-lower ranking for academic outcomes. Public exam A Level results from 2012 and 2013 were used to rank schools.

#### Measuring steering cognition regulation across the three school types

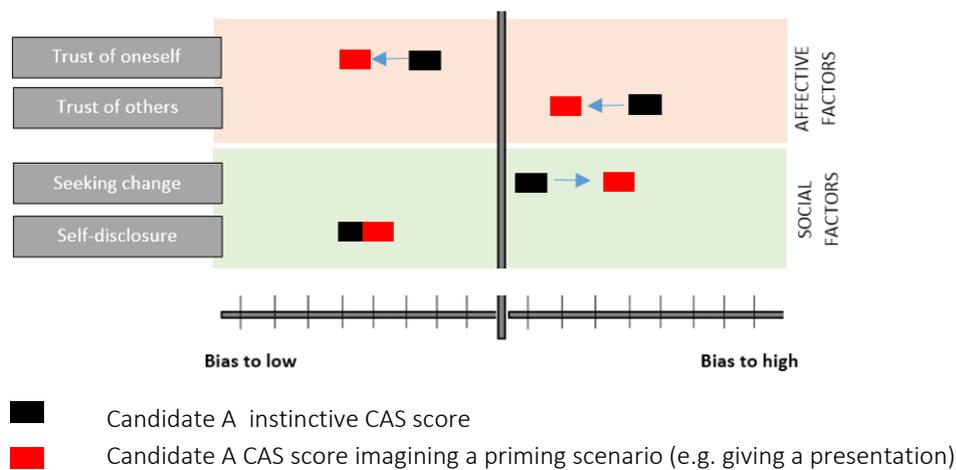
Walker and Walker have developed a calibrated measure of steering cognition called CAS Tracking. The CAS Tracking assessment measures the effect of the school road on the steering cognition of pupils by taking multiple comparative readings: first, pupil's instinctive steering cognition, and then subsequently their steering cognition when primed to imagine participating in multiple typical school scenarios hypothesised to be require non-cognitive skills. In this study the hypothesised priming scenarios were:

1. Participating in the tutor group or boarding house in school (whichever is relevant for the school type)
2. Showing prospective parents round the school
3. Responding to a person in need
4. Facing public exams
5. Giving a public presentation
6. Dealing with a problem at school
7. Visiting an independent school on a school visit
8. Visiting a state school on a school visit
9. Attending a university interview in competition with an independent school candidate
10. Attending a university interview in competition with an state school candidate

CAS Tracking measures four independent adjustable factors of steering cognition for each priming scenario:

1. Trust of self (labelled factor S)
2. Trust of others (labelled factor L)
3. Self-disclosure (labelled factor P)
4. Seeking change (labelled factor X)

Factor scores provide the ability to interpret the meaning of any single steering cognition score. A steering cognition score measured by CAS Tracking will contain a number on a linear scale between 0-15 for each of the factors, which represents the degree of steering cognition bias under that priming scenario. The difference between the pupil's *instinctive score* and the in-school score for each *individual priming scenario* can be attributed to the single variable which has been altered i.e. the priming scenario (Figure 1). The method is described in detail by Walker (Walker 2015i).



### 3. Results

#### Instinctive steering between the school types

A Wilcoxon test was used to compare instinctive pupil steering cognition bias scores for each of the four factors between the three school types (Figure 2 a.),  $p > 0.5$ . No significant difference between the three types was found. A second comparison between boarding and day (combined state and independent) also showed no significant difference (Figure 2 b.). This result indicates that any subsequent differences cannot be attributed to pupil or parental background, but will be attributable to the school as an in-school effect.

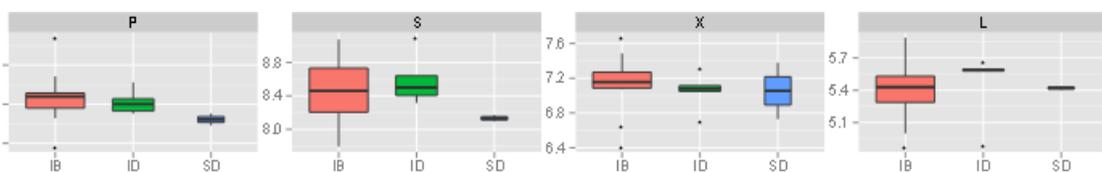


Figure 16 a. Instinctive CAS biases by ■ boarding school, ■ independent day and ■ state day

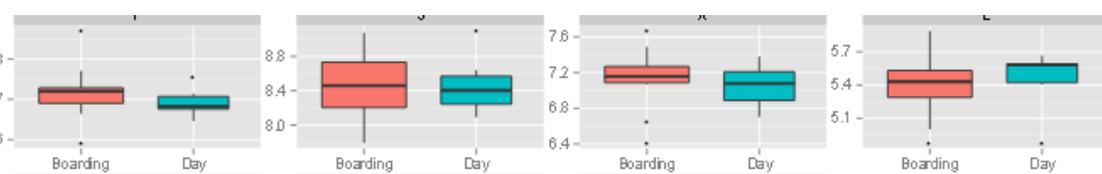


Figure 16 b. Instinctive CAS biases by ■ boarding school and ■ day school (state/independent combined)

Instinctive compared to primed in-house/tutor group steering across the three types

A Wilcoxon test was used to compare *instinctive* to *primed 'in house/tutor group'* pupil steering cognition bias scores for each of the four factors between the three school types (Figure 3 a.) ,  $p > 0.5$ . A significant difference between the three types was found for each of the four factors ( $p = 0.0191$  self-disclosure,  $p = 0.034$  trust of self,  $p = 0.026$  seeking change,  $p = 0.005$  trust of others). A second comparison between boarding and day (combined state and independent) also showed significant differences between boarding and day schools ( $p = 0.007$  self-disclosure,  $p = 0.009$  trust of self,  $p = 0.005$  seeking change,  $p = 0.0004$  trust of others). (Figure 3 b.)

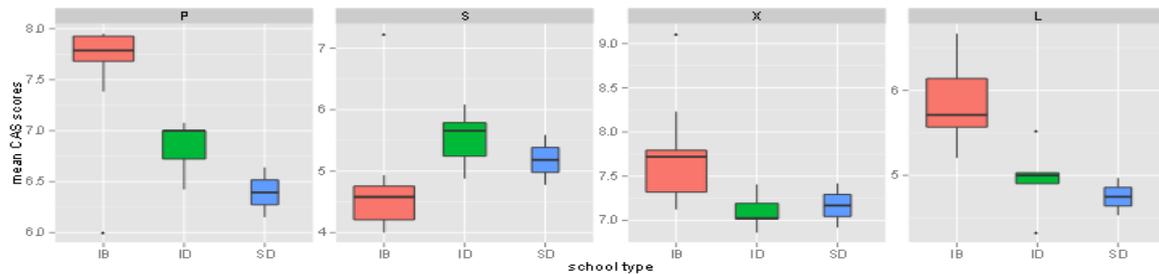


Figure 3 a. In house/tutor group CAS biases by ■ boarding school, ■ independent day and ■ state day

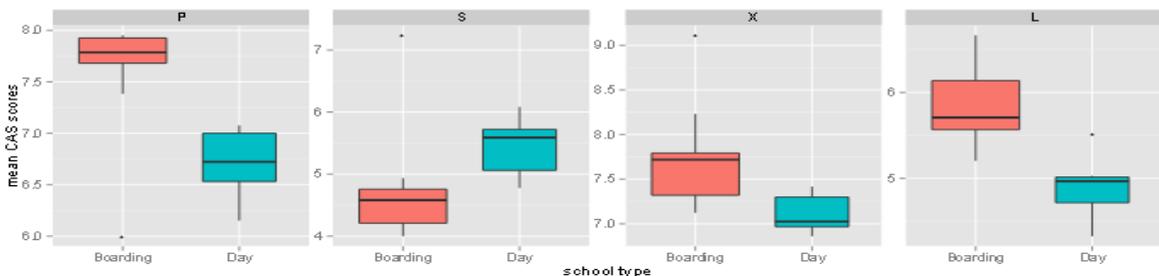


Figure 3 b. Instinctive CAS biases by ■ boarding school and ■ day school (state/independent combined)

**Discussion**

Participating in a school boarding house has a significantly increased effect on pupils' steering cognition over participating in a tutor group or house at a day school. Pupils at all school types adjust the four factors to some extent, becoming more self-disclosing, less trusting of self, more trusting of others and less seeking of change when in the house. However, boarding pupils adjust all four factors to a far greater extent. Their adjustment of their non-cognitive social and emotional steering is more acute.

In house/tutor group cohesion and belonging across the school types

The variance between instinctive and in house/tutor group primed steering scores was calculated (Figure 4 a). Trust of others (TO), the degree to which one wants to trust other people, can be thought of as a measure of **autonomy**; Self-disclosure (P), the degree to which one wants to share one's own thoughts, ideas and feelings, can be thought of as a measure of **concealment**; Trust of self (S), the degree to which one asserts one's own identity, can be thought of as a measure of **separateness**; Seeking change (X), the degree to which one seeks novel experiences, can be thought of as a desire for stimulation, or **change**, in the immediate surroundings.

	Boarding	Independent day	State day	Mean day
<b>Autonomy</b>	8.7	9.8	9.25	9.525
<b>Concealment</b>	5.7	8	7	7.5
<b>Separateness</b>	-0.4	3.7	3	3.35
<b>Change</b>	8.9	12.7	11.4	12.05
	<b>5.725</b>	8.55	7.6625	8.10625

Figure 4 a.

Mean variance in autonomy, concealment, separateness and change for boarding pupils was 5.73, compared to 8.55 for independent day pupils, and 7.66 for state day pupils. These results are plotted on a kite chart (Figure 4.b).

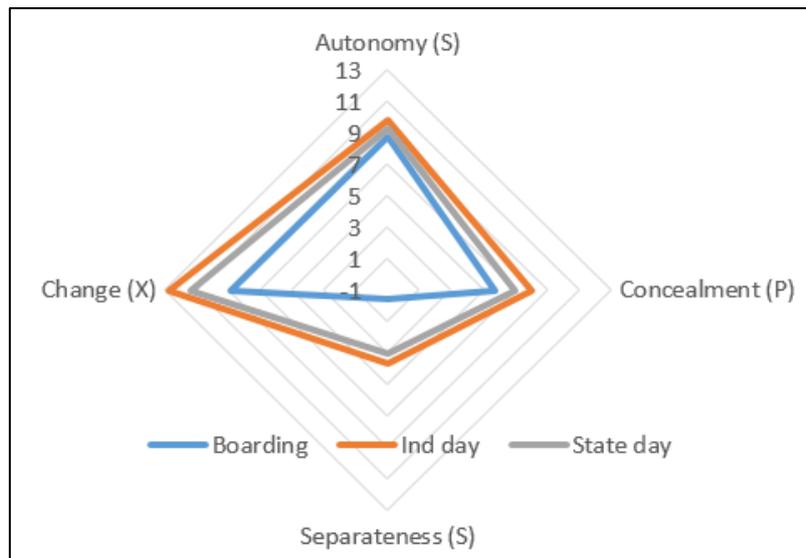


Figure 4. The lower scores of boarding pupils when primed by in-house indicate psych-social characteristics associated with group membership, belonging and cohesion.

### Discussion

The difference in mean variance between instinctive steering compared in-school steering, as measured by **autonomy, concealment, separateness and change**, indicate that day pupils are 40% more invested in steering away from community & toward independence in school compared to boarding pupils. Boarding pupils invest in biasing their steering cognition toward noticing, responding to and participating within increased community: higher disclosure, lower separateness, lower autonomy and lower desire for change. The combination of these four steering biases paint a picture of a greater psychological attachment, mutuality, co-dependence and belonging exhibited by boarding pupils in the context of the house, compared to their instinctive state, and in comparison to their day school peers- both independent and state. By contrast, day pupils exhibit a higher degree of self-reliance, autonomy and interest in novel experiences.

There is no difference between these four factors for state and independent day schools, indicating that boarding rather than fee paying is the significant factor determining the differences in steering cognition.

### Adjustment of trust of others across all 10 primed scenarios

Pupils from all 3 school types exhibited similar patterns of steering cognition adjustment for *trust of others* (L) across all 10 scenarios- see Figure 5. Noticeable, all pupils adjusted their trust of others most dramatically *facing a problem at school or a person in need*, increasing their trust of others most in those primed scenarios. However, boarding pupils exhibited a greater social and emotional adjustment in those scenarios than day pupils, indicating a higher degree of responsiveness to the social need or problem they were facing.

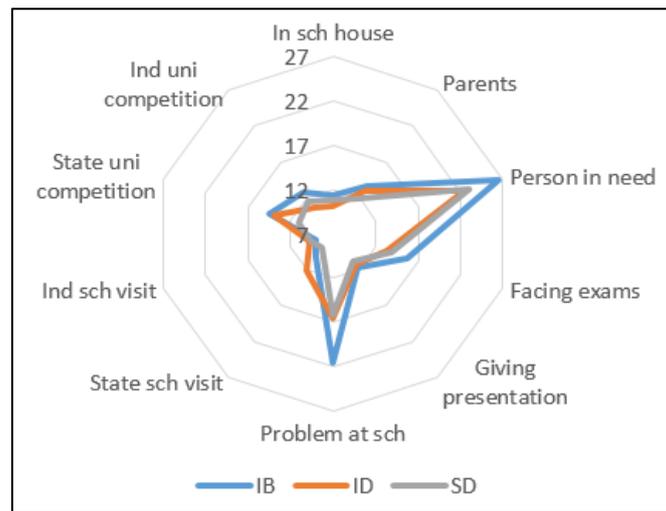


Figure 5. Adjustment of trust of others (L) where a score of 0 = no adjustment from instinctive and a score of 27 is the highest exhibited adjustment from instinctive

Adjustment of self-disclosure across all primed scenarios

Pupils from all 3 school types exhibited similar patterns of steering cognition adjustment for *self-disclosure* (P)- see Figure 6. Noticeable, all pupils adjusted their self disclosure most dramatically *facing a problem at school or a person in need*, increasing their self-disclosure most in those primed scenarios. However, boarding pupils exhibited a consistently greater social adjustment across all scenarios than day pupils, indicating a higher degree of responsiveness to each of the 10 primed scenarios.

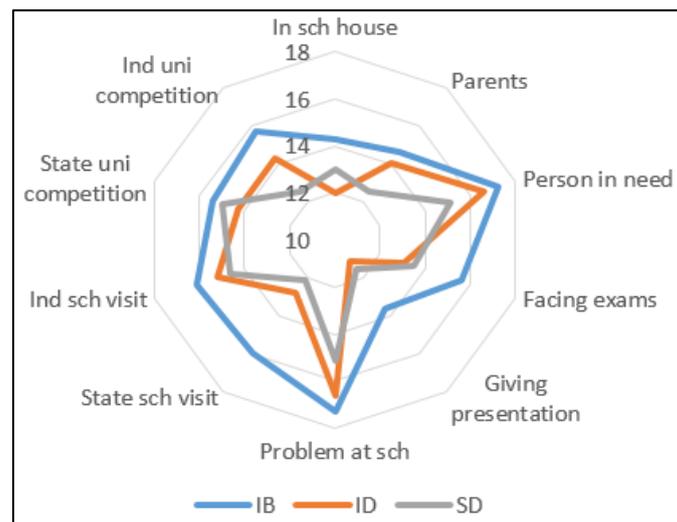


Figure 6. Adjustment of self-disclosure (P) where a score of 0 = no adjustment from instinctive and a score of 17.5 is the highest exhibited adjustment from instinctive

Adjustment of trust of self across all primed scenarios

Pupils from all 3 school types exhibited similar patterns of steering cognition adjustment for *trust of self* (S)- see Figure 7. Noticeable, all pupils adjusted their *trust of self* most dramatically in the *house, facing exams and giving a presentation*, lowering their *trust of self* most in those primed scenarios. However, boarding pupils exhibited a consistently greater social and emotional adjustment across all scenarios than day pupils, indicating a higher degree of responsiveness to each of the 10 primed scenarios.

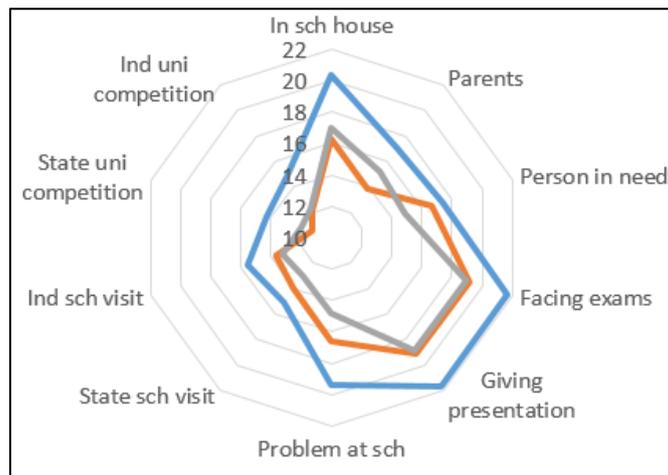


Figure 7. Adjustment of trust of self (S) where a score of 0 = no adjustment from instinctive and a score of 22 is the highest exhibited adjustment from instinctive

Adjustment of seeking change across all primed scenarios

Pupils from all 3 school types exhibited similar patterns of steering cognition adjustment for *seeking change* (X)- see Figure 8. Noticeable, all pupils adjusted their *seeking change* most dramatically *facing exams, facing a problem at school, dealing with a person in need, and visiting another school*, increasing their seeking change most in those primed scenarios. However, boarding pupils exhibited a consistently greater social adjustment across all scenarios than day pupils, indicating a higher degree of responsiveness to each of the 10 primed scenarios.

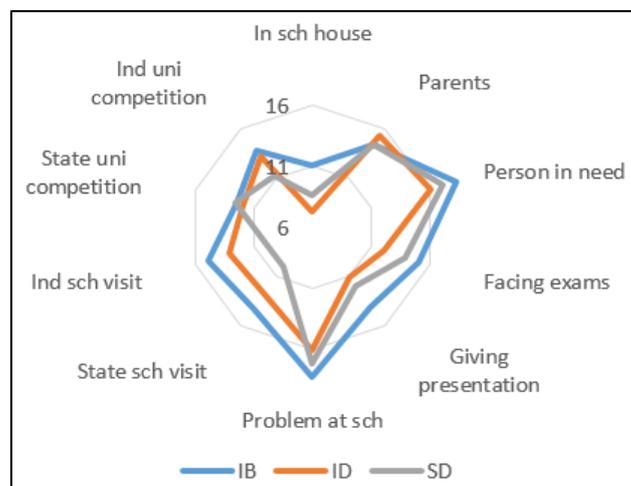


Figure 8. Adjustment of seeking change (X) where a score of 0 = no adjustment from instinctive and a score of 19 is the highest exhibited adjustment from instinctive

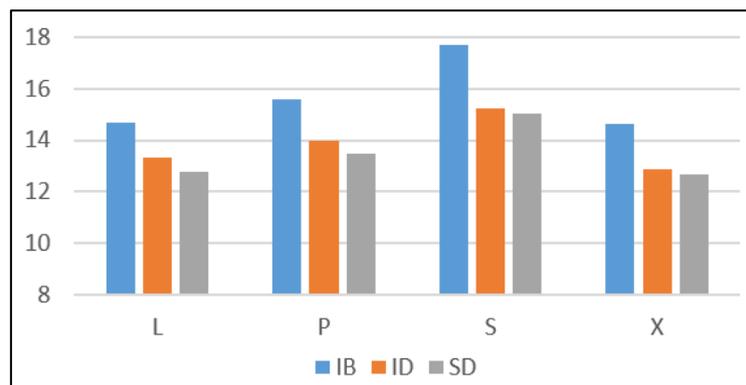
Figure 9. shows the overall adjustment from instinctive for the three types of school, against the four factors of steering cognition (L, P, S and X). A two tailed t-test to test for difference in means was used to test for difference between boarding and independent day ( $m = 15.4, 13.8, t_{critical} = 1.99, p = 0.019$ ), indicating that there was a statistically significant difference between the overall variance shown by boarding pupils compared to independent day pupils. Boarding pupils showed higher adjustment of steering cognition than independent day.

A two tailed t-test to test for difference in means was used to test for difference between boarding and state day ( $m = 15.4, 13.5, t_{critical} = 1.99, p = 0.005$ ), indicating that there was a statistically significant difference

between the overall variance shown by boarding pupils compared to state day pupils. Boarding pupils showed higher adjustment of steering cognition than state day.

A two tailed t-test to test for difference in means was used to test for difference between boarding and state day ( $p > 0.05$ ), indicating that there was not a statistically significant difference between the overall variance shown by state day pupils compared to independent day pupils.

The mean adjustment of steering across the 10 primed scenarios was 15.62 for boarding pupils, 13.87 for independent day pupils and 13.50 for state day pupils. From these results, boarding pupils are 13% more socially agile in the adjustment of their steering when facing these 10 scenarios compared to independent day pupils, and 16% more agile compared to state day pupils, both of whom were more self-orientated. Since there was no statistically significant difference between state and independent day, the difference in social agility between boarding and day can be said to be 15%.



**Figure 9. State day and independent day pupils did not show significant difference in adjustment of steering cognition across the 10 primed scenarios. Boarding pupils showed significant difference from both state and independent day.**

## Overall Discussion

### The imprint of the in-house experience

These results indicate that significant psycho-social differences exist between pupils educated at boarding and day schools.

Specifically, non-cognitive differences that can be described by degree of situational adjustment of social-emotional aspects of steering cognition, a function which influences how an individual attends to and responds to the situation around them. Boarding pupils were 40% more invested in biasing their steering toward social cohesion, compared to day pupils who were biased toward individual independence. Boarding pupils were also 15% more socially agile compared to day pupils who were more socially self-orientated in different scenarios. It is important to emphasise that this is a psychological and not a moral difference. Social agility does not imply moral superiority.

These differences were not found to be significant between fee and non-fee paying schools, in that both state and independent day pupils exhibit non-statistically significantly different adjustment of steering cognition across the non-academic priming scenarios tested. School academic rank did not significantly influence these outcomes.

Walker uses the analogy of a car driving along a road to illustrate that an individual's steering is affected by the characteristics of the 'road' on which they drive (Walker 2015f). In this result, the conditions of the boarding road contribute to individuals steering with a greater awareness of, and responsiveness to, other drivers around them. By contrast, the conditions of the day school road, whether fee paying or non-fee paying, contribute to individuals steering with greater autonomy and self-reference. The boarding drivers look out of their windows

to adjust their driving to the behaviour of other drivers; the day school drivers look more at their own controls and adjust their behaviour on their own terms.

The results also suggest that a key element of the social experience that may contribute to these differences is the *school house*. Significantly increased steering cognition states, attributed to psychological attitudes of cohesion, community, disclosure, belonging and stability were exhibited by boarding pupils primed by their in-house experience at school. Whilst equivalent in-school day school group priming (house or tutor group) resulted in a similar *pattern* of 'in group' attitudes, the *extent and degree* of these attitudes was significantly lower. It did not vary between state day and independent day.

The results suggest that the boarding house creates a kind of collective environment which shapes the psychological attributes of the steering cognition of the pupils. Pupils exhibit attentional and responsive biases towards group membership such as higher self-disclosure, higher willingness to concede, higher desire to join in and be included, higher desire to maintain cohesion and intimacy. Pupils at day schools correspondingly exhibit greater attentional and responsive biases towards individual autonomy, novel stimulus and self-reliance. Whilst these differences are a matter of degree, the results support the conclusion that boarding pupils are shaped by a stronger group experience which leaves an ongoing psycho-social imprint.

#### An ongoing effect transferred to wider social-emotional adjustment

This ongoing imprint is evidenced in the sustained and consistent greater willingness and ability to adjust social and emotional state (as measured by adjustment of steering cognition), when facing the range of further non-house related priming scenarios: *giving a presentation, taking visiting parents round the school, responding to a pupil in need, facing a problem at school, facing an exam, visiting another school and competing at a university interview*. The results suggests that the pattern of greater social and emotional adjustment obtained by the in-house experience, transfers to greater willingness and ability to adjust when facing wider tasks, situations and challenges. This adjustment can be thought of as an increased social sensitivity, which results in greater social agility, emotional adaptation and collective self-identification.

#### Post-school social agility

The results suggest that this increased boarding pupil social sensitivity and emotional adaptation may not be limited to in-school scenarios. In both the primed *visit to other schools*, and a *competitive university interview*, the same pattern of response was observed: boarding pupils exhibiting steering patterns associated with greater social sensitivity and emotional adaptation.

These scenarios were included to test for social agility when outside one's own 'tribe' i.e. when visiting school or competing against a peer from a different school type. The results indicate that pupils from all types adjusted their steering cognition more when visiting or competing against those from different school types; however the effect was relatively small, though smallest in state pupils. Independent boarding and independent day pupils both exhibited more adjustment toward state day pupils than *vice versa*. This adjustment consisted of greater openness to and inclusion of the other. This study does not support the claim that school types breeds a kind of tribalism in which one favours one's own.

However, it is likely that differences in patterns of behaviour attributable to school type are recognisable. The recognisable behaviours associated with this boarding effect are those of *social fluency rather than social dominance*. For example, an ability to negotiate the subtleties of the social situation, to read the cues and adjust one's response accordingly; in particular, a willingness to negotiate, concede and provide space to include others. The results of these steering biases are likely to be a perception that boarding pupils are more at ease in social situations and are more able, and willing, to make others feel included and involved.

#### Employable skills cultivated through the boarding environment

Consistently employers cite the ability to work in a team, problem solve, be resourceful in decision making and communicate well. In a recent survey 30% of employers complained that recruits with strong academic qualifications lack these generic business skills required in the working world (Archer, Davidson 2008). Greater ability to read the cues, negotiate the subtleties of the social situation and include others appear to fulfil a number of these required skills very strongly. It may be that the close environment of the boarding house provides a training ground for working out collaborative solutions, being resourceful and communicating well, which employers find desirable.

In recent years, ideas of collective or situational leadership, which conceive of the ability of the leader to be responsively mobile, have become prominent. Pearce and Conger (2003) define leaders with such skills as “*individuals... who can rise to the occasion to exhibit leadership and then step back at other times to allow others to lead*” (p. 2). The results of this study suggest that boarding may equip graduates with greater abilities to exhibit such situational leadership. If this is the case, then this may contribute to boarding school graduates being promoted into leadership roles above their peers.

#### Pastoral support

The results also indicate that pupils in a boarding environment will be more sensitive to and affected by impacts and events within that space. The relatively lower responsiveness of day pupils suggests that they will be more resilient than their boarding peers when challenges or problems arise, probably because they have wider environments to which they are connected which remain unaffected by any in-school event. Pastorally, the inference of this study is that boarding pupils are more vulnerable, as well as responsive, to the nuances of the social, emotional and academic environment around them at school. The intensity of the experience provides both increased risk factors, as well as future protective factors to these pupils.

#### High performing Motorway schools

Walker and Walker have provided evidence in previous studies for what they call the Motorway Model of education, which they argue lies behind the current UK secondary school academic assessment framework. The Motorway Model is based on an ideological belief that the quality of education can be measured by the number of pupils, and their distance travelled, down an academic road toward narrowly defined publicly examined academic targets.

In the UK, the authors maintain that this model has driven a culture and pedagogy within schools to fulfil these motorway goals. For example, schools have narrowed the educational road by reducing the diversity of styles of pedagogy in the classroom and curricula beyond the classroom; schools have made the teaching experience homogeneous, reducing the number of divergent routes that individuals might wander down in their lessons as well as outside lessons; schools have focused on narrow academic levels, targets and public exams as indicators of their success. Walker and Walker argue that the emergence of a Motorway Model is driven more by government policy than school strategy. Schools seek to deliver educational outcomes within the framework of assessment set by the national government which, they argue, is the highways agency of education ultimately responsible for what schools aim for, and how pupils are taught.

The researchers have shown evidence that higher academically performing schools within this assessment framework, are likely to exhibit greater Motorway Model characteristics than lower performing schools (Walker 2016). They have shown that high ranking schools have narrower school roads, upon which pupils travel faster, but may come at a previously hidden price: *the relative reduction in the development of the ability of pupils to regulate their steering cognition*. This current study suggests that any such lowering of the development of the ability to adjust steering cognition may not only have academic consequences at school, but professional consequences beyond school. If a greater ability to adjust steering cognition for the task and situation in hand is one of the empirically measured assets that boarding pupils possess over their day school peers, then an educational ideology that inadvertently undermines the development of such skills may be counter-productive.

In the introduction to this paper, we acknowledged the disparity between rising academic standards at state schools, and the continued gap in occupation of elite roles in society, industry and government by privately educated pupils. This study has identified real psycho-social differences between at least some of those privately educated pupils- those who attended boarding schools. This boarding effect difference is likely to contribute to skills which are desirable to employers, recognised as central to effective leadership and are attractive to peers because they build inclusion, team work and belonging. Whilst not all pupils from boarding environments will manifest these skills, if a population as a whole exhibits more of them than other populations, it is likely to continue to skew the occupation of higher leadership roles in business and society toward that group.

### Further questions

This study did not include a cohort of state boarding schools, which would have provided the opportunity to measure whether the boarding effect was contingent upon fee / non-fee provision. The author conjectures this is unlikely to be supported because the observed boarding effect was related to a social phenomenon consistent to boarding, whether in a fee/ non-fee environment.

However, the current research cannot discount that a proportion of the identified effect might be attributed to the narrow socio-economic demography of boarding pupils. The effects of similarities in background wealth and upbringing would only be empirically described by testing boarding in more socio-economically mixed cohorts. State boarding schools could provide a population in which the strength of this communitarian boarding effect to cross differences in socio-economic background could be tested.

### Conclusion: Building the boarding effect back into schools

The boarding effect is best understood as an individual psychological asset which is gained by living within a communitarian environment. The experience of a close and sustained group environment in which self-adjustment, social awareness and cultural self-identification become psychological assets and are developed by individuals. Whilst day schools cannot replicate such total contact with their pupils, they can build in structural processes which provide a similar experience of in-group association. We suggest that a school can foster these communitarian effects by adopting four approaches:

1. Using uniform, stories and rituals to create a distinct and unique sense of in-school group identity
2. Creating small vertical groups or 'houses' within a large school, which have strong, distinct spaces, traditions and differences of tone between them, and lively competition between houses
3. Ensuring that such groups are demographically diverse such that the boarding effect fosters cohesion beyond social, economic, ethnic or any other background
4. Structuring experiences in which pupils serve one another, and limit their individual freedom and choice for the sake of a wider good or collective good.

Anthony Seldon, former Master of Wellington College in the UK, has suggested that

*"These [boarding] effects are not academic, but about how schools are structured and run, and how young people can be encouraged to experience life together. Houses, rituals, traditions and competition are all fundamental at every boarding school, but not in all state schools."*

Whilst the government has focused on driving up academic standards in UK state schools, this study suggests that an overlooked route towards narrowing social mobility would be for the government to incentivise schools to cultivate more of these communitarian characteristics. Were it to do so, the effects would expect to be measured by an increase in steering cognition capacity to match those of boarding pupils. In the longer run, it would be expected to manifest in more high performing pupils from state schools rising to elite roles in industry, society and government. If the boarding effect were sustained across socio-economically mixed boarding populations, the finding would point the way toward an education with positive outcomes for social cohesion, as well as academic results.

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## Publication bibliography

- Adams, Richard (2016): Massively improved state schools threaten private sector. In *Guardian*, 2/16/2016. Available online at <http://www.theguardian.com/education/2016/feb/05/massively-improved-state-schools-threaten-private-sector>, checked on 2/16/2016.
- Archer, Will; Davidson, Jess (2008): Graduate Employability. What do employers think and want? The Council for Industry and Higher Education. UK. Available online at <http://www.brunel.ac.uk/services/pcc/staff/employability/?a=92718>.
- Bauer, Isabelle, M.; Baumeister, Roy, F. (2011): Self Regulatory Strength. In : Handbook of Self Regulation. Research, Theory and Applications, pp. 64–78.
- Baumeister, Roy F.; Bratslavsky, Ellen; Muraven, Mark; Tice, Dianne M. (1998): Ego depletion: Is the active self a limited resource?, Vol 74(5), May 1998, 1252-1265. In *Journal of Personality and Social Psychology* 74 (5), pp. 1252–1265.
- Baumeister, Roy F.; Vohs, Kathleen D. (Eds.) (2004): Handbook of self-regulation. Research, theory, and applications. New York: Guilford Press.
- Blair, Clancy (2002): School readiness. Integrating cognition and emotion in a neurobiological conceptualization of children's functioning at school entry. In *The American psychologist* 57 (2), pp. 111–127.
- Boström, Lena; Lassen, Liv M. (2006): Unraveling learning, learning styles, learning strategies and meta-cognition. In *Education + Training* 48 (2/3), pp. 178–189. DOI: 10.1108/00400910610651809.
- Demetriou, A. (2000): Organisation and development of self-understanding and self-regulation. In M. Zeidner (Ed.): Handbook of Self-Regulation. San Diego: CA:Academic, pp. 209–251.
- Education Endowment Fund (2013): Teaching and Learning Toolkit. EEF and Sutton Trust. Available online at [http://educationendowmentfoundation.org.uk/uploads/toolkit/Teaching\\_and\\_Learning\\_Toolkit\\_\(Spring\\_2013\).pdf](http://educationendowmentfoundation.org.uk/uploads/toolkit/Teaching_and_Learning_Toolkit_(Spring_2013).pdf).
- Eisenberg, N.; Fabes, R. A.; Guthrie, I. K.; Reiser, M. (2000): Dispositional emotionality and regulation: their role in predicting quality of social functioning. In *Journal of Personality and Social Psychology* 78 (1), pp. 136–157.
- Eisenberg, Nancy; Spinrad, Tracy L.; Eggum, Natalie D. (2010): Emotion-related self-regulation and its relation to children's maladjustment. In *Annual review of clinical psychology* 6, pp. 495–525. DOI: 10.1146/annurev.clinpsy.121208.131208.

- Eisenberg, Nancy; Valiente, Carlos; Fabes, Richard A.; Smith, Cynthia L.; Reiser, Mark; Shepard, Stephanie A. et al. (2003): The relations of effortful control and ego control to children's resiliency and social functioning. In *Dev Psychol* 39 (4), pp. 761–776.
- Eisenberg N.; Damon w.; Lerner. (Eds.) (2006): *Handbook of Child Psychology*. New York: Wiley.
- Evans, Jonathan. (2011): Dual-process theories of reasoning: Contemporary issues and developmental applications. In *Developmental Review* 31 (2-3), pp. 86–102. DOI: 10.1016/j.dr.2011.07.007.
- Human Ecology Education (6/19/2015): The Tribe Effect. UK. Available online at <http://humanecology-education.co.uk/press-2/>.
- Rothbart, M. K.; Ahadi, S. A.; Evans, D. E. (2000a): Temperament and personality: origins and outcomes. In *J Pers Soc Psychol* 78 (1), pp. 122–135.
- Rothbart, M. K.; Ahadi, S. A.; Evans, D. E. (2000b): Temperament and personality: origins and outcomes. In *J Pers Soc Psychol* 78 (1), pp. 122–135.
- Rothbart, Mary K.; Bates, John E. (2007): Temperament. In William Damon, Richard M. Lerner (Eds.): *Handbook of Child Psychology*. Hoboken, NJ, USA: John Wiley & Sons, Inc.
- Sallquist, Julie Vaughan; Eisenberg, Nancy; Spinrad, Tracy L.; Reiser, Mark; Hofer, Claire; Zhou, Qing et al. (2009): Positive and negative emotionality: trajectories across six years and relations with social competence. In *Emotion* 9 (1), pp. 15–28. DOI: 10.1037/a0013970.
- Simonds, Jennifer; Kieras, Jessica E.; Rueda, M. Rosario; Rothbart, Mary K. (2007): Effortful control, executive attention, and emotional regulation in 7–10-year-old children. In *Cognitive Development* 22 (4), pp. 474–488. DOI: 10.1016/j.cogdev.2007.08.009.
- Shaheen, Faiza (2014): Inequality in the UK – whatever happened to social mobility? New Economics Foundation. UK. Available online at <http://www.neweconomics.org/blog/entry/inequality-in-the-uk-whatever-happened-to-social-mobility>.
- Social Mobility Child Poverty Commission (2014): *Elitist Britain?* [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/347915/Elitist\\_Britain\\_-\\_Final.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/347915/Elitist_Britain_-_Final.pdf). UK. Available online at [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/347915/Elitist\\_Britain\\_-\\_Final.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/347915/Elitist_Britain_-_Final.pdf).
- Stanovich, Keith E. (2011): *Rationality and the reflective mind*. New York: Oxford University Press.
- Stanovich, Keith E.; West, Richard F. (2008): On the relative independence of thinking biases and cognitive ability. In *Journal of Personality and Social Psychology* 94 (4), pp. 672–695.
- Stanovich, Keith E.; West, Richard F. (2014): What Intelligence Tests Miss. In *The Psychologist* 27 (2), pp. 80–83.
- Sutton Trust (2012): *THE SOCIAL MOBILITY SUMMIT*. Report on The Social Mobility Summit. Sutton Trust; Carnegie Corporation of New York. UK. Available online at <http://www.suttontrust.com/wp-content/uploads/2012/09/st-social-mobility-report.pdf>.
- Tangney, June P.; Baumeister, Roy F.; Boone, Angie Luzio (2004): High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. In *Journal of Personality* 72 (2), pp. 271–324.
- Trentacosta, C.J., & Shaw, D.S. (2009): Emotional self-regulation, peer rejection, and anti-social behaviour: Developmental associations from early childhood to early adolescence. In *Journal of Applied Developmental Psychology* 30 (3), pp. 356–365.

Vohs, Kathleen D.; Baumeister, Roy F.; Schmeichel, Brandon J.; Twenge, Jean M.; Nelson, Noelle M.; Tice, Dianne M. (2008): Making choices impairs subsequent self-control: a limited-resource account of decision making, self-regulation, and active initiative. In *J Pers Soc Psychol* 94 (5), pp. 883–898. DOI: 10.1037/0022-3514.94.5.883.

Walker, J. (2015a): A psychological and developmental understanding of affective-social self-regulation. DProf. University of Winchester, UK.

Walker, J. (2015b): A psychological understanding of over-self-regulation. DProf. University of Winchester, UK.

Walker, J. (2015c): AS Tracking: A psychological and developmental understanding of embracing change. DProf. University of Winchester, UK.

Walker, J. (2015d): AS Tracking: A psychological and developmental understanding of self-disclosure. DProf. University of Winchester, UK.

Walker, J. (2015e): AS Tracking: A psychological and developmental understanding of trust of others. DProf. University of Winchester, UK.

Walker, Simon P. (2014 h.): Educating the self-regulation of bias. University of Bristol. UK. Available online at <http://simonwalker.com/#/research-publications/4587873262>.

Walker, Simon P. (2015f): Thinking, straight or true? Human Ecology Education. UK. Available online at <http://simonwalker.com/#/research-publications/4587873262>.

Walker, Simon P. (2016 g): The Motorway Model. Driving pupils minds fast but teaching them to steer. UK. Available online at <http://steeringcognition.org/#section-press-2>, updated on 2/16/2016.

Walker, Simon P.; Walker, J. (2016 h): Mental Health Risks of the Motorway Model. UK. Available online at <http://steeringcognition.org/#section-press-2>, updated on 2/16/2016.