Mental health risks of the Motorway Model of Education

SHORT PAPER

Simon P Walker, DProf, MTh, MA (Oxon), BTh, MBsPS

Jo Walker, BA

Mind.World

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reception@mind.world

Http://mind.world

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Abstract

Mind.World short papers present findings from our research studies within a succinct literature context. This paper describes research to measure the effect of a model of education which has been termed the 'Motorway Model' upon the mental health of pupils. The Motorway Model is described; key features of high speed and narrowness of pedagogic route are explained. An assessment, CAS Tracking, designed to measure these Motorway characteristics of schools is described. A study of 19 UK secondary schools measured is described and data showing the link between road width, speed and increased pupil welfare and mental health risks is described. The results support the idea that high performing schools exhibit motorway characteristics which in turn, are linked to increases in pupil welfare and mental health risks.

Highlights

- Steering Cognition is a means of measuring the relative character of a school's learning road
- Using this measure, high performing schools exhibit narrower learning roads and pupils making faster decisions
- These characteristics are consistent with the Motorway Model of education
- However, these characteristics are shown to be linked to increased risks of self-harm and not coping with pressure
- An alternative to the Motorway Model is to teach children to steer their minds rather than simply drive them fast

1. Mental health in affluent and aspirational children

Until recently, it was widely assumed that poor mental health was associated with a kind of poverty: poverty of opportunity, a poverty of education, poverty of love and support or poverty of hope. However, recent studies have evidenced that for the first time, the highest risk group amongst teenagers for mental health problems are in fact the very people who should be most protected from such risks: *high-performing girls from the most aspirant and affluent homes*.

US research on teenage depression indicated that 38% of 15yr old girls from the most affluent social classes were suffering with depression or anxiety compared with 27% from the lowest socio economic class (West, Sweeting 2003). One contributing factor it seems was social and family isolation. Researchers found there was a correlation between family wealth and a child's perceived and real isolation from parents and others.. And this was not just a US problem. Several UK studies have shown the same correlations (Luthar, Becker 2002). But the problem is not just isolation; it is expectation.

The more affluent a pupil, the more driven they are to achieve both academically and through extra-curricular activities causing performance-related mental health issues (Luthar, Latendresse 2005). Consistently, academically high performing girls were found to be the group at greatest risk of mental health problems, not the lowest. According to researchers Professor Patrick West and Dr Helen Sweeting, levels of mental health issues directly related to pressures and anxieties around academic school performance had risen dramatically in just 2 years amongst girls from 19% to 33% (Sweeting et al. 2012). This US figure was mirrored by the experience of *ChildLine,* a UK charity supporting children, in which 58% of calls made were by teenagers citing exam pressure, an increase of 200% from 2013-2014 (NSPCC). It seems that teenagers who are well resourced, and trying their very best to succeed at school, are being put at the greatest risk of crashing.

The Motorway Model

Walker and Walker have coined the idea of a Motorway Model of education to describe the characteristics of schools exhibiting these increased incidences of pupil mental health risks. In their Motorway Model, pupils feel under pressure to travel faster and further in order to achieve bigger academic goals. To facilitate this, schools narrow the educational road, by reducing the diversity of styles of pedagogy in the classroom and curricula beyond the classroom. According the Motorway Model idea, making the teaching experience consistent, reducing the number of divergent routes that individuals might wander down in their lessons as well as outside lessons, and focusing on a narrow range of assessment targets, schools can accelerate academic pupil progress more effectively. 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.

Whilst many studies have identified the link between increased mental health risks and aspirational background, this study asks a different question. Is there a link between schools exhibiting the characteristics of the Motorway Model and increased pupil mental health risks?

2. Measuring the width and speed of the Motorway

Walker and Walker have developed an online pupil assessment, CAS Tracking, to measure characteristics of the Motorway Model exhibited by a school. CAS Tracking measures 'steering cognition', a model of a cognitive executive function which contributes to how we regulate our attention and coordinate our corresponding responses (Walker 2015i). Steering cognition describes 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 analytic or 'algorithmic processing', which is responsible for how we process complex calculations (Walker 2015i; Stanovich, West 2014, 2008; Stanovich 2011; Evans 2011). Algorithmic processing has been shown to underpin IQ and IQ-like cognitive reasoning tasks which form the basis for many school assessments.

CAS Tracking, as a measure of steering cognition, is proposed as a valid means of calibrating the relative characteristics of the school 'road' because steering cognition is environmentally primed, or biased, by school-specific characteristics. Unlike IQ, steering cognition is an ecological cognitive function; pupils' adjustment of steering cognition is influenced by the specific school environment in which they are learning. For example, schools with formal uniform and more controlling cultural norms and classroom pedagogies have been shown to reduce the variance of steering cognition displayed by the pupils (Walker 2014 h.).

The CAS Tracking assessment measures the effect of the school road on the steering cognition of pupils by taking two comparative readings: first, pupil's instinctive steering cognition, and then second, their steering cognition when engaged on the school road. By comparing the two measures, a calculation of the effect of the school road upon the population's steering cognition is made. The method is described in detail by Walker (Walker 2015i).

The CAS Tracking assessment measures the steering cognition patterns of the school population to calculate two properties: first, the relative width of the school road (measured by the total variance of steering cognition shown by the population on the school road) and second, the speed by which pupils are travelling along it (measured by the speed pupils make steering cognition adjustments). The researchers conjectured that the width of the school road and the speed of pupils give a representation of Motorway Model characteristics of the school. For example, a school in which pupils exhibited lower steering cognition variance across the population, and travelled faster, would reflect a school with higher Motorway characteristics. A school where pupils travelled slower and showed more variation would reflect a school with lower Motorway characteristics.

Width and speed of the school road

As a measure of 'school road width' population variance can be thought of as a herding quotient: the lower the variance, the tighter bunched the population of pupils are. For example, low variance in the instinctive scores for a pupil population would indicate that the school recruits from a tightly bunched population whose steering cognition is similar. If that population's variance increased on the school road, this would be an indicator that the width of the school road is wider than the instinctive road.

Inter-school road width can be compared by measuring this quotient across sample schools measured using the same method. The relative difference in variance of steering cognition scores indicates the relative narrowness of the school road compared to the wider population of school road widths (Figure 1.).

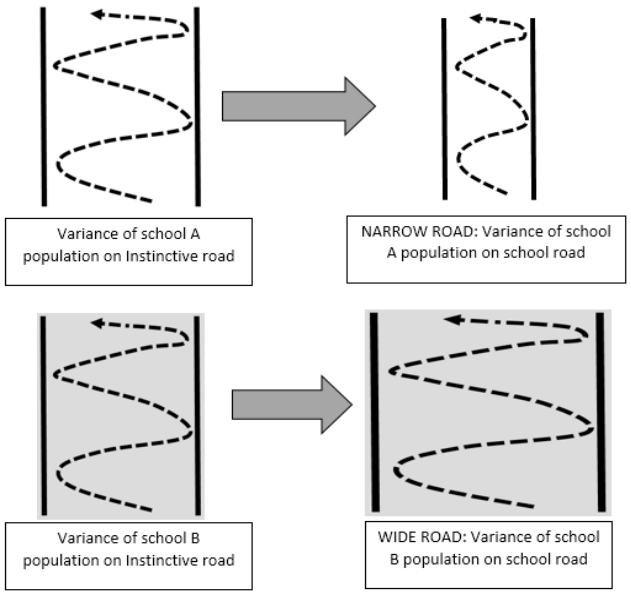

Figure 1. The concept of measuring school road width illustrated by two notional schools, A and B: A exhibiting narrow school road width (low population variance of steering cognition), and B exhibiting wide road width (high population variance of steering cognition)

Speed is a calculation of the time taken for a pupil to make steering cognition adjustments during the assessment. Previous studies have shown that pupils from higher academically ranking schools showed higher speed of response to priming cues than pupils at lower ranking schools. The researchers conjectured that pupils at high ranking schools are not rewarded for investing cognitive load into effortful CAS adjustment. Instead, pupils may deploy cognitive energy into algorithmic, computational tasks (Walker 2015i). High speed of response is also interpreted as a less well regulated CAS state, which is thought to be effortless and to may contribute to inaccurate thinking, through automatic nonconscious but biased responses.

This study measured the CAS Tracking of 2518 pupils in 16 secondary schools in the UK. Pupil 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. Six of the schools were day and 10 were boarding. 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. In addition to the main population, three further ranked UK secondary schools from a previous study (n = 422), whose road width had been measured using the same CAS Tracking assessment method, were included in the relevant part of the analysis on school width. Because speed and steering cognition risk was not measured in these three schools, they were not included in that part of the analysis.

3. Measuring pupil mental health

Perceived mental health risks

Pupils were asked to respond anonymously to three written questions asking if they suffered from self-harm, had experienced being bullied over the past year or were not coping with pressure at school. Pupil's responded to a five-point Likert scale (not at all- not- not really- a bit-yes). Because these responses were provided with the assurance of anonymity to the school, we regarded responses as a reasonable indicator of actual pupil risks of these three mental health and welfare concerns.

Poor Pupil steering cognition patterns

Pupil risks of mental health and welfare concerns were then matched to patterns of pupil steering cognition. The aim was to identify whether certain patterns of steering cognition correlated with increased mental health risks.

To achieve this, a machine learning method was used to detect patterns which correlated with self-perceived pressure, self-harm and bullying risks. A support-vector-machines (SVM) model was first trained on the pupil perceived risk dataset. Then when used on the non-training steering cognition data, the percentage accuracy of predicting only from pupil CAS Tracking scores pupils who were considering self-harm, experiencing bullying or not coping with pressure was calculated. The model was cross-validated to test for both the percentage probability of both cases (bullied/not bullied etc.). The model was able to provide three percentage probabilities for each pupil that their steering cognition pattern associated them with the specific risks of (i) self-harm, (ii) not coping with pressure or (iii) being bullied.

- Bullying
  The steering cognition pattern model achieved an 80% accuracy in predicting children who were experiencing bullying. The accuracy identifying those bullied was 83%, whilst the accuracy identifying those not bullied was 78%.
- Pressure

The steering cognition pattern model achieved a 83% accuracy in predicting children who were not coping with pressure at school. The accuracy identifying those not coping with pressure was 88%, whilst the accuracy identifying those coping with pressure was 77%.

Self-harm

The steering cognition pattern model achieved a 80% accuracy in predicting children who were considering self-harming. The accuracy identifying those considering self-harming was 82%, whilst the accuracy identifying those not considering self-harming was 78%.

These results evidence that steering cognition patterns provide a reasonably reliable indication of pupil mental health and welfare risks, without the need to obtain answers to direct welfare/mental health questions. As such, a comparison between steering cognition pattern scores and Motorway Model school characteristics was regarded as a valid method to identify whether there was a relationship between the school road and increased pupil mental health risks associated with poor steering cognition.

To achieve this both pupil steering cognition pattern identified percentage risks, and actual pupil mental health/welfare risks, were then compared to school road characteristics: road width and speed. In addition, comparison with school rank and type was performed by gender and overall.

4. Results

Road width vs school rank

Results showed that in most cases, the school road is wider than the instinctive road (Figure 1). However, the higher the rank of school, the smaller that increase in width. This result was significant [F (1,19) = 5.432, P= 0.018). This result indicates that the relative increase in width of the school road in higher ranking schools is significantly lower than the increase in width of the school road in lower ranking schools. This result occurs when the diversity and spread of steering cognition through the routes of maths, science and english lessons is less in higher ranking schools than lower ranking schools. This result was especially true of the intake of high ranking day schools at the age of 13 and 14, in which the width of the crowd of those younger students was especially tightly marshalled. Because data was monotonic, linear and ranked a Spearman rank correlation was used. The result showed a strong association of 0.63 between high performing schools and road width; high performing schools exhibit narrower school roads than low performing schools.

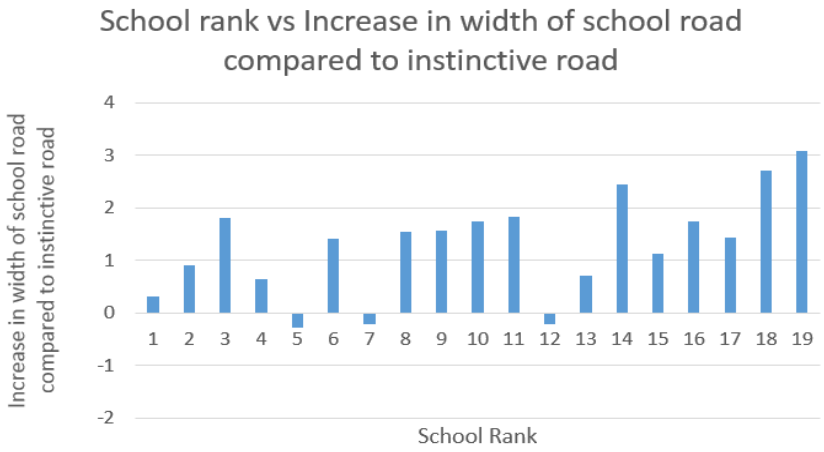

Figure 1 indicating that school road width, as compared to the instinctive road width, increased as school rank decreased. High ranking schools showed lower increase in school road width than lower ranking schools. A negative number indicates that the school road was narrower than the instinctive road.

Speed vs school rank

Figure 2 a. shows the relative speed by which pupils in three school 'buckets' (high performing day schools, low performing day schools and high-low boarding schools) adjusted their steering cognition. As found in previous experiments, pupils in high ranking schools made their adjustments faster than those in the low ranking schools. The speed of steering cognition response is an indicator of the relative speed of cognitive judgements made by pupils. Analysis of variance across school rank (ignoring school type) proved that the relationship between school and steering cognition speed was statistically significant [F (1,18)= 9.327, P= 0.04), and explained 26% of the variance of school rank (Spearman's rho = 0.51) (Figure 2 b.).

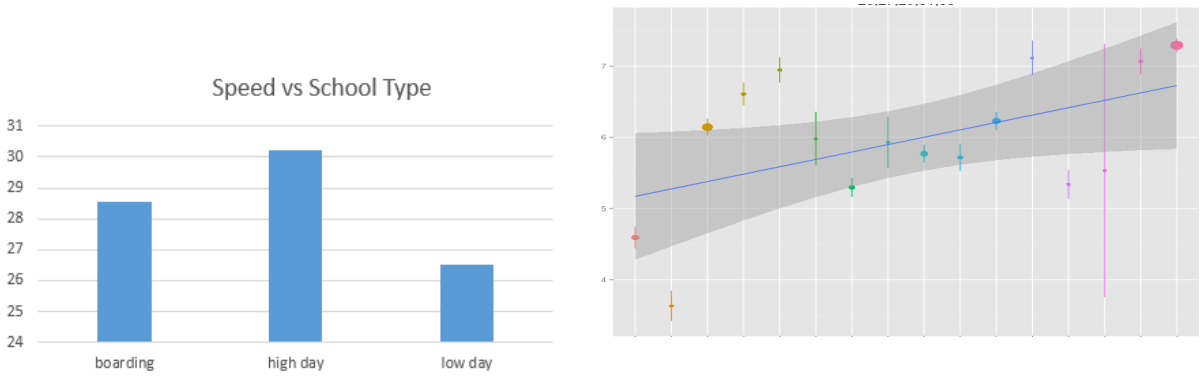

Figure 2 a. and b. High ranking schools (X axis) showed shorter 'time of response to priming cue' (Y axis) than low.

School rank vs steering cognition pattern risks

Linear regression and Spearman rank correlation analysis was performed to compare school rank and pupil steering cognition pattern risks as identified by the machine learning technique. Schools 7, 9 and 13 were removed from the analysis because of sample size for the generation of steering cognition patterns (less than 40 pupils/ school was regarded as statistically unreliable). Correlation results are shown in Figure 3.

	RANK	Pressure	Self Harm	Bullied
RANK	1			
Pressure	0.76519	1		
Self- harm	-0.5889	0.698979	1	
Bullied	0.46911	0.714621	0.949087	1

Figure 3

A strong correlation was found between school rank and steering cognition risk patterns associated with not coping with pressure (0.76) and self-harm (-0.59). A moderate association between rank and steering cognition patterns associated with bullying (0.47) was also found.

Regression analysis indicated that the result for Pressure was statistically significant, [F (1,12) = 16.951, P= 0.001), indicating that there is probably a relationship between steering cognition patterns associated with not coping with pressure and school rank. The result for Self-Harm was also statistically significant [F (1,12) = 16.951, P= 0.026), indicating that there is probably a relationship between steering cognition patterns associated with self-harm and school rank. The result for Bullying was not significant (P>0.05), and the moderate correlation would need to be further tested with a larger sample size to confirm if it is statistically probable to represent a relationship with school rank.

The relationship between school rank and pressure is shown in Figure 4.

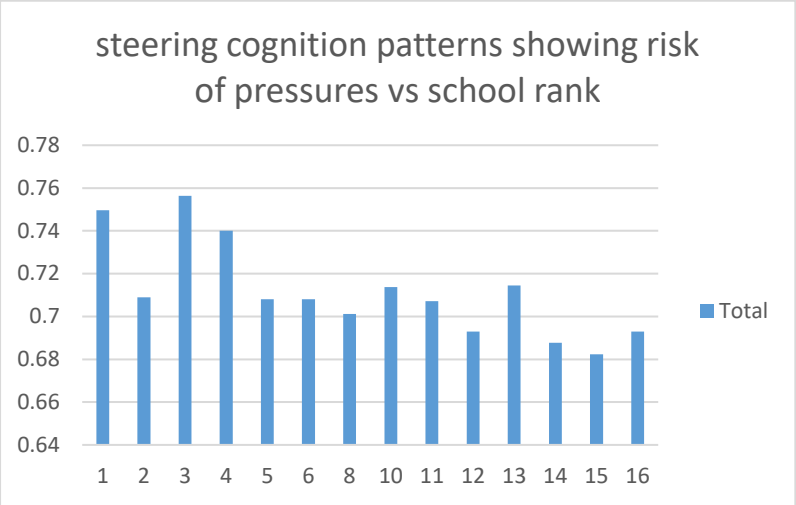

Figure 4 Showing school rank on the X axis and the steering cognition pattern mean risk of not coping with pressure

Steering cognition patterns vs road width and speed

Rankings for width and speed were assigned to each school. Ranks for both were then averaged to give a composite school road score for width/speed. A composite steering cognition risk score for Pressure and Self Harm for each school was also calculated.

The school width/speed score was then compared with the school Pressure/Self-Harm score to test for relationship. A Spearman rank correlation indicated a strong relationship (0.6) between the width/speed of the school road and the Pressure/Self-Harm steering cognition score for girls. A lower correlation of 0.33 was found for boys.

A regression analysis was used to test for the significance of these relationships. The results for girls [F (1,10) = 6.64, P= 0.027] indicate that there probably is a significant relationship between width/speed of the school road and steering cognition patterns of not coping with pressure and self-harm in the school amongst girls. For boys the relationship was no significant and would require a larger sample size of schools to be confirmed.

This girls' result was confirmed by testing whether relative *increase* in school road width, compared to instinctive road width, altered the result. The result [F (1,10) = 6.3, P= 0.031) indicates that both the absolute width of the school road, and the relative increase in width of the school road, combined with pupil speed, both probably show significant relationship to steering cognition patterns of not coping with pressure and self-harm. These results are shown in Figure 5.

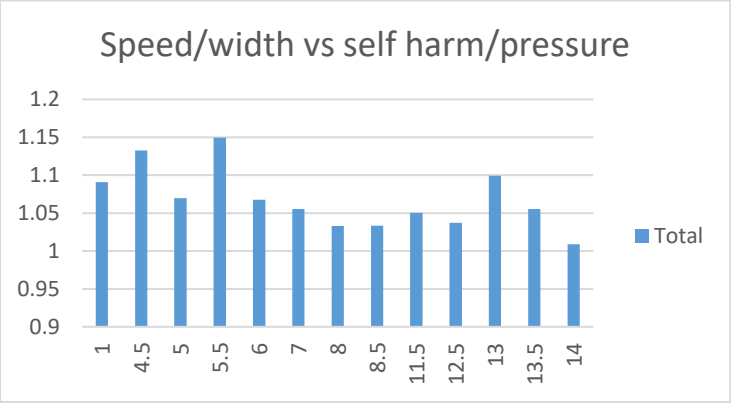

Figure 5 Showing the relationship between the speed/width measure of schools (Y axis) plotted against the self-harm/pressure measure (X axis)

5. Discussion

High performing Motorway Schools

These results support Walker and Walker's idea that high performing schools exhibit characteristics of the Motorway Model. A strong and significant association (0.62) indicates that high performing schools exhibit narrower school roads than low performing schools; pupils drive along in tighter groups with less variation between them. They also show less variation across a range of curriculum subject lessons suggesting that pedagogy is more uniform and focused upon more narrow academic progress rather than metacognitive adjustment to distinctive features of diverse curriculum learning tasks.

A strong and significant association (0.51) indicates that pupils at higher performing schools also show higher speed of steering cognition adjustment. Walker conjectures that increased steering cognition adjustment speed may provide pupils' with the ability to deploy more cognitive resources to their algorithmic cognition, which underpins IQ and is central to school academic assessment, than to their self-regulation of their affective-social-cognitive attention (Walker 2015i). Combined together, this study provides evidence that high ranking schools have narrower school roads, upon which pupils travel faster, exhibiting characteristics of being an educational motorway rather than a broader educational road. The results suggest that the focus on academic attainment, which is underpinned by the development of analytical or algorithmic cognition, may come at a previously hidden price: *the relative reduction in the development of the ability to self-regulate one's steering cognition.*

Increased mental health and welfare risks

Jo Walker argues that the self-regulation of steering cognition is a factor explaining lower pupil welfare and mental health. Walker has identified both fixed steering cognition bias, dysregulated bias and over-regulated bias as causes of self-regulatory problems (Walker 2015g, 2015a, 2015b).

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. 2000b; Demetriou 2000; Eisenberg N. et al. 2006). As such, it 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. 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).

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. 2000a; 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).

Narrow, fast roads are linked to poor self-regulation and wellbeing risks

The results also evidence a strong and significant association between school rank and steering cognition patterns which indicate risks of not coping with pressure (0.76) and self-harm (0.59). Pupils at higher performing schools exhibit patterns of steering cognition which are associated with poor-self regulation, increasing the risks that the

pupils will struggle to cope with the pressure, and may have risks of self-harming. Poor steering cognition has been shown to be reliable indicator mental health and welfare risks due to reduced self-regulatory control, lower emotional functioning, lower social competencies (Walker 2015i). Jo Walker has claimed that pupils with poor steering cognition are less likely to reach out for help when they need it, are more likely to seek self-soothing strategies which are unhealthy, are more likely to engage in controlling or socially risk taking behaviours (Walker 2015a, 2015d, 2015c, 2015f, 2015e) .

The result for girls supports the interpretation that the increased risks associated with poor steering cognition is related to the narrowness and speed of the school road. A strong and statistically significant correlation was found for girls between the narrowness and speed of their school road, and steering cognition patterns associated with not coping with pressure, and risks of self-harming. Whilst the association of welfare/mental health steering cognition risk patterns, school rank and school road width/speed do not prove a causation, the coincidence, as well as the theoretical basis, strongly indicates that the Motorway Model of education is likely to be a factor in poor, mentally unhealthy steering cognition patterns, especially amongst girls, which are associated with welfare and mental health risks.

Over-achieving and over-regulating: precursors to a crash

One explanatory theory of mental health risks in high performers is proposed by Jo Walker who has described the *over-regulation* of steering cognition as a precursor to dysregulation of attentional steering biases (Walker 2015b). Walker highlights that self-regulation is effortful and depletes personal resources, making poor decision making more likely (Baumeister et al. 1998; Baumeister, Vohs 2004).

Walker cites widespread qualitative evidence from multi-year longitudinal coaching work conducted by teachers with pupils in schools in which pupils with over-regulated steering cognition exhibit sudden, unexpected veering, or dysregulation as well as dysfunctional behaviours. Walker notes that often such pupils are high performers, motivated, conscientious and responsible, often in position of leadership or responsibility for others. The subsequent, sudden dysregulation is often unpredicted and without forewarning and manifests in behaviours which may be self and socially destructive. One such example, whose steering cognition was tracked over 18 months, illustrates the sudden dysregulation that occurred at a trigger point, after the sustained over-regulation of the previous 15 months (Figure 6).

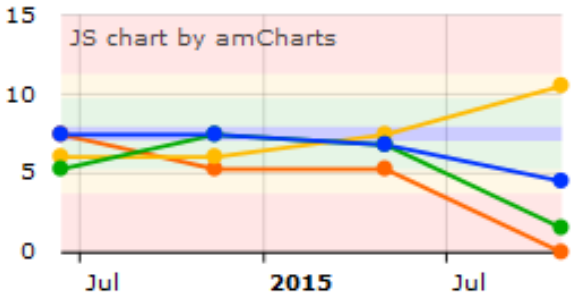

Figure 6 showing the tracked steering cognition for a single pupil (as measured by four factors shown in blue, green, yellow and red). The close regulation of scores from May 2014-May 2015 indicate over-regulation, followed by sudden dysregulation after that.

Walker argues that such sudden dysregulation is akin to a driver over-concentrating on a road, taking notice of all the road signs, the other road users, trying not to make a mistake and get anything wrong, who suddenly reaches a point of self-regulatory depletion where they cannot control their driving any more. A small and apparently trivial trigger can then cause them to disproportionately veer off, and crash.

If Walker is right, this study suggests that the narrow, fast motorways of high performing schools may be associated with steering cognition patterns of struggling with pressure and self-harming, as a direct causal

consequence. The pressure to over-regulate in order to drive on the straight, narrow fast road, leads to a subsequent consequence of dysregulation due to depletion.

The evidence from this study suggests that the so-called Motorway Model of education is linked to schools seeking to narrow the road and push pupils to drive faster. These characteristics are most apparent in high performing schools as one would expect in a public educational governance system which rewards characteristics which 'fit' the model. Whilst pupils at such schools develop the ability to drive fast and straight, using the kind of algorithmic cognition which underpins IQ and public examinations (Walker 2015i), this study evidences that there is a corresponding cost to their development of good self-regulation. The specific, lower ability to appropriately regulate steering cognition is linked to pupils from high performing schools with narrow, fast roads. Patterns of steering cognition associated with increased risks of self-harm and not coping with pressure are evidenced on these roads.

Because steering cognition has been shown to be a largely independent cognitive function to algorithmic cognition, it appears that an overly narrow focus on the latter has had an unintended cost to the former. Like drivers being taught to drive fast on motorways, pupils' minds are not being developed to regulate their cognitive steering function; for example, to know when and how to slow down and when to speed up; when to struggle and when to signal the need for help; when to trust and assert their right of opinion, and when to defer to others and accept critique; when to drive according to the map and when to seek their own route. These skills, whilst developed in the classroom, transfer to a pattern of steering beyond it, enabling pupil's to steer their emotional, social and abstract cognition across the more varied, difficult, unpredictable complex landscapes of adolescence. Minds driving fast and straight show increased vulnerabilities and lower protective factors, failing to seek support and engaging in patterns of behaviour which are self-harming or unhealthy.

Beyond the Motorway Model of Schools

The Motorway Model of school has come at a price. Schools can be engineered to build narrow, fast roads and to accelerate the progress of their pupils accordingly. However, there appears to be a cost. The question is whether the benefit makes the cost worthwhile. The answer may depend on whether education is seen as a means to get pupils as far down an academic road as possible, or whether it is a context to teach them how to drive.

The two alternatives are not necessarily antithetical. Walker has evidenced that about 15% of academic outcomes at secondary school are attributable to steering cognition as opposed to IQ. Better steering cognition need not come at a price of worse academic outcomes but can improve it. Teaching pupils to drive will improve their overall ability to be resourceful, metacognitively aware and exhibit strong self-efficacy, which have been evidenced as being critical for academic success (Hattie 2009; Ainley 2006; Alter et al. 2007; Boström, Lassen 2006; Education Endowment Fund 2013). Indeed, a study with first year undergraduates at a UK university evidenced that academic outcomes were improved by coaching students to improve their steering cognition(Walker 2015h).. This was achievable by making visible to the pupil's their individual steering cognition biases and by providing explicit classroom signposts which could be used by tutors to guide and direct students in how to adjust and regulate their steering cognition for the learning task they were engaging in.

This methodology echoes the objectives of 'visible learning' espoused by John Hattie, in which the intangible processes of pedagogy are replaced with explicit, tangible and visible dialogues between teacher, pupils and peers, and create metacognitive agency, found by multiple studies to accelerate learning (Hattie 2009). An educational governance framework which measured both the development of steering cognition and academic attainment would broaden the educational road from its current, narrow motorway whilst continuing to achieve academic excellence.

Whilst improving pupil steering cognition may have academic benefits, but it is also likely to have pupil welfare benefits. Pupils supported to improve poorly regulated steering cognition, with teachers using the tool AS Tracking, in order to lower their welfare risks, have shown evidence of improvements in both as a result. In one study of the methodology, pupils at a UK secondary school were identified as having high risk on a welfare scale. The pupils were supported by specific, targeted interventions over a period of 6 months by the school to lower

their risk (for example, coaching, 1:1 mentoring). Steering cognition scores were also measured providing a before intervention and after intervention measure. Changes in pupil steering cognition scores were compared to changes in welfare risk score over the same period. Results showed that improvements in steering cognition were linked to improvements in welfare risks (Walker 2015i).

Conclusion

This current relatively large population study indicates that the Motorway Model has negative consequences for pupil mental health. These two previous small studies indicate that the Motorway Model is not the only model of education which can achieve effective academic results. They also indicate that whilst pupil mental health risks are linked to the Motorway Model, those risks can be reduced by alternative approaches which foster and educate the ability of pupils to steer rather than to simply drive fast.

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