AS Tracking

Self-regulation: the ability to steer

"A growth in self-regulation during adolescence may improve children's ability to navigate the challenges and stress in their increasing broadening and decreasingly supervised contexts that mark the transition to adolescence."

(King et al., 2013 p.2)

Adolescence is a period of necessary exploration through which pupils broaden their experiences and make their own choices in order to develop and assert their emerging identity (Erikson 1968). It is a time of appropriate fluctuation, as pupils navigate the many concurrent transitions that mark the onset of adolescence (Harter 1999). The metaphor of the adolescent learner driver transitioning from child passenger to skilled driver captures this increasing sense of freedom, individuation and autonomy; yet it also captures the threats and risks that we know beset many learner drivers.

Statistics suggest that an increasing number of current adolescents growing up in western societies are struggling to steer the high opportunity, high risk road of adolescence (Bradshaw, Richardson 2009; OECD 2009). The fast changing social road on which we all now 'drive' presents opportunities and experiences that were not available to earlier generations, yet the boundaries and signposts that guided their parents through the necessary transitions of adolescence are less visible. Today's adolescents face more choices than any other adolescent generation before them, with the potential adverse consequences more far-reaching and irreversible, perhaps even resulting in them steering off the road and pastorally 'crashing'. The ability to steer effectively, making wise choices is critical.

The description of those choices as 'wise' rather than 'right' is intentional. To have used the word 'right' might infer that the choices adolescents have to make are dualistic and binary, simple and clear. They are not. Most real time choices that adolescents make are complex, with many conscious as well as subconscious influencing factors. Adolescents' ability to make wise choices infers judgment; discerning a course of action amidst complexity where the way forward is not necessarily clear.

It is important to acknowledge that the construct of 'wisdom' is imbued with philosophical and spiritual meaning. It is a word often associated with age; a virtue honed through the journey of life as one begins to lay down accrued personal maps whilst remaining open to the current landmarks and signposts that guide future actions. It may seem an anomaly and inappropriate to expect wise choices of adolescents who are still in the process of accruing those mental maps. Yet, the cost to adolescents of not making wise choices as they navigate the road of adolescence is perhaps greater than it has been for previous generations. If pupils are to navigate this road, we must equip them to wisely steer their responses to the choices they are presented with. To do so, we must ascertain at a cognitive level what is happening neurobiologically when an adolescent makes a wise choice. We might consider describing this neurological process as 'steering cognition'. Whilst further exploration of this suggested term cannot be afforded at this point, an extended exploration can be read in the paper 'How the AS Tracking assessment measures steering cognition'.

Over recent years, a number of neuroscientists have explored the link between wisdom and cognition. Their objective is to measure the specific cognitive functions that could account for how and why some people make wiser choices than others do. Wise choices in this context refer to decisions which lead to personal emotional health, and pro-social behaviours (Birren, Svensson 2009; Watson 2012; Meeks, T.W., Jeste, D.V. 2009; Meeks, Jeste 2009; Watson 2012).

Their premise is that if these cognitive functions can be identified, they could be positively influenced, leading to improved emotional health, pro-social behaviours and social decision-making. The cognitive function most aligned with the ability to make wise choices is the psychological construct of *self-regulation.*

Defining self-regulation

Self-regulation has been described 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 (Eisenberg N. et al. 2006; Demetriou 2000; Rothbart et al. 2000b). A more pithy definition is offered by Meeks and Jest who describe it as "the ability to reflect on and control behaviour, thoughts and emotions" (Meeks, T.W., Jeste, D.V. 2009 p.3). Self-regulation is a purposeful, effortful and dynamic process, requiring both awareness and action. Adolescent 'learner drivers' who are increasingly making their own choices on an increasingly complex road, need to develop the ability to self-regulate. They need self and social awareness to 'read 'the road on which they are driving, and the ability to purposefully adjust their responses to bring about an intended outcome.

We might describe self-regulation as wise driving. As wise drivers drive, they draw on the knowledge and mental maps they have accrued through experience. They use their internalised highway code to read the signposts, and adjust their actions because they foresee the consequences of not doing so. They are aware of their strengths and limitations as a driver, modifying their actions accordingly. They are aware of contextual variables such as the weather, the capabilities of their car or their own mood. They notice and anticipate the actions of other road users, adjusting their responses moment by moment.. They exhibit awareness and agency, both of which are central to the construct of self-regulation (Dunlosky, J., Metcalfe, J. 2009).They are continuously reading the road and adjusting their response; it is an on-going dynamic interaction.

A wise driver reads the cues as they drive, adjusting their response for the situation at hand.

How might our driving metaphor apply to the experience of adolescent pupils? Every day pupils drive on different roads. They engage in many different social contexts, interact with different social groupings and face different challenges. To navigate these different contexts successfully, pupils need to both draw upon the learning they have acquired throughout their development to date, whilst also noticing the different social and emotional contextual cues. Pupils who self-regulate are those who 'read' the context and wisely adjust their response. In doing so, they purposefully draw from a growing range of possible affective-social responses.

If we are to identify self-regulation as an important skill enabling pupils to steer the road of adolescence, thereby lowering the risk of 'crashing', it is important to review the evidence supporting a link between self-regulation and healthy adolescent psychosocial functioning.

Self-regulation: a critical developmental goal of childhood and adolescence

Research in the field of self-regulation has grown exponentially over the last fifteen years. In the preface of their seminal handbook on self-regulation, Vohs and Baumeister state:

> Self-regulation has emerged from obscurity and uncertain beginnings to become one of the most central important concepts of all psychology.
>
> (Vohs, Baumeister 2011)

Their bold statement is underpinned by evidence identifying self-regulation as the bedrock of healthy psychological, emotional and social functioning and a critical developmental goal of childhood and adolescence (Vohs et al. 2008; Neuenschwander et al. 2012; Allan, Lonigan 2011; Bandura et al. 2003). Many academics believe self-regulation acts as a protective buffer to the inevitable strain as adolescents transition into adulthood (Caspi et al. 1995; Mischel et al. 1988; Kalavana et al. 2010). In contrast, poor self-regulation correlates with a wide range of internalising and externalising difficulties, suggesting poor self-regulation is an early indicator of future affective-social difficulty (Vohs, Heatherton 2000; Blair 2002; Eisenberg et al. 2000; Simonds et al. 2007; Tangney et al. 2004; Trentacosta, C.J., & Shaw, D.S. 2009). We shall look at the impact of self-regulation on affective-social functioning further on in this paper.

How self-regulation develops throughout childhood

Self-regulatory capacity is evident from a young age. Babies of just a few weeks adjust their affective-social responses in order to elicit attention from their caregivers (Kopp 1982, 2009). By the end of their first year, toddlers show an ability to purposefully withhold their affective response from a care giver (Calkins, Fox 2002). These early indicators of self-regulation are driven by the subcortical system; a system sometimes described as the sensory, present-focused, impulsive circuit of the brain. As their prefrontal cortex matures, children are more able to anticipate cause and effect and exhibit self-control - skills more commonly associated with self-regulation (Mischel et al. 2011; Heatherton, Wagner 2011).

Self-regulatory skill develops through scaffolding and modelling (Goldberg 2006], ©2005, 2009; Bruner 1977). Infants who experience '*good enough'* care from their early caregivers (Bowlby 2005b) are initially extrinsically regulated (Eisenberg et al. 2010; Hubbard, Dearing 2004). Their caregivers give them routines, boundaries and structures, enabling them to see the world as a consistent, reliable and predictable place. This physical containment gives them a sense of safety and security; they develop the maps which tell them how the world works. They also experience emotional containment in times of distress; their needs are acknowledged and their emotional valence is 'emotionally contained' and re-regulated (Eisenberg et al. 2010; Maughan, Cicchetti 2002; Sroufe 1997; Geddes 2006). We might describe infants as metaphorically belted into their baby seat whilst caregivers negotiate the driving for them.

Throughout early and middle childhood, for the majority of children, the level of scaffolding gradually decreases as their ability to self-regulate increases (Bruner 1978). They are given behavioural expectations which signpost and make visible appropriate self-regulation in different situations. They are taught effective problem solving strategies which increases their self-efficacy and agency (Bandura et al. 2003; Casey, Caudle 2013; Yurgelun-Todd 2007; Sebastian et al. 2008). The language of choice and consequence enables them to anticipate the consequences of the choices they make, developing skills for self-reflection to support improved choices in the future. They notice how others emotional self-regulate in times of high affect and start to mimic it themselves (Bandura 1977b). When distressed or overwhelmed, they are supported to find a healthy and socially appropriate expression of those feelings (Sroufe 1997; Smith, Hart 2011). Children who experience *'good enough'* care at this stage are perhaps out of their car seat; they are observant and curious passengers, picking up the modelled habits of those around them. They are accruing the knowledge and understanding populate the mental maps that will inform their driving when they become learner drivers themselves. Of course, the hope is that those accrued mental maps will support wise future driving; sadly, this not always the case.

Adolescents show increased evidence of intrinsic self-regulation (Ryan, Deci 2000). They exhibit decreased impulsivity (Casey et al. 2008; Colman et al. 2006; Steinberg 2007), increased ability to anticipate, plan and execute a decision (Bandura 2010; Bandura et al. 2003) and are more discerning about what they disclose and to whom (Leon-Carrion et al. 2004a; Leone, Hawkins 2006; Altman, I., & Taylor, D. A 1973; Jourard 1971). There is a widely circulated myth that adolescents' self-regulation of risk is biologically impaired during adolescence. On closer look, studies suggest this impairment is contextual rather than biological. Risk taking is strongly influenced by a desire to accrue social recognition from peers (Rolison, Scherman 2002; Smetana et al. 2006; Morrongiello, Lasenby-Lessard 2007; Dalton et al. 2010; Crockett et al. 2006; Chein et al. 2011b). For many, adolescence is a time of improved self-regulation; the mitigating factor is that they are no longer passengers, but learner drivers who are learning to steer a more powerful engine, on a high opportunity, high-risk road and navigating many variables all at the same time.

Self-regulation has a biological component

The level of affective-social self-regulation exhibited by a child is influenced by an interaction of biological and contextual factors (Colman et al. 2006). Psychologists identify a genetic predisposition towards self-regulation, suggesting some children may find self-regulation more challenging than others. For example, babies who are highly impulsive or experience high emotionality are likely to need a higher level of extrinsic regulation and scaffolding (Rothbart, Bates 2007; Sallquist et al. 2009; King et al. 2013; Lengua 2002). Research suggests that children who struggle to self-regulate at an early age are less resilient to the adverse impact of contextual factors such as economic disadvantage, marital discord and neo and post-natal stress (Compas 2009; Raver 2004). In contrast, children with a genetic predisposition towards self-regulation experience a greater level of buffering from adversity.

The impact of different parenting styles on the development of self-regulation

A correlation has been identified between the quality of caregiving and a child's ability to self-regulate (Kozhevnikov 2007). Inconsistent limit setting, poor maternal wellbeing and lack of caregiver warmth, sensitivity and responsiveness have all been found to hinder self-regulation (Maughan, Cicchetti 2002; Lengua 2002; King et al. 2013; Williams et al. 2009; Raffaelli et al. 2005; Choe et al. 2013; Bowlby 2005a; Eisenberg N. et al. 2006). Mccoby and Martin's parenting style categorisation is a helpful framework to explore this further (Maccoby, Martin 1983).

Authoritarian parenting, defined by high control and low warmth has been associated with difficulties in making wise decisions and personal agency (Holmbeck et al. 1995). We might see these pupils as driving on a narrow road, which is didactically signposted. Permissive or indulgent parenting, defined by low control and high warmth, has been associated with high levels of impulsivity and substance abuse, academic apathy and helplessness, and anticipated autonomy (Steinberg 1990). These children could be seen as those driving in powerful cars, on a wide road with bouncy crash barriers; they remain naïve and impervious to the learning experiences that should develop their self-regulation. Absent or negligent parenting, defined by low control and low warmth has been associated with particular difficulties in the self-regulation of social behaviours and an increase of externalised difficulties. They have not experienced the level of scaffolding and modelling essential for self-regulation to develop (Bowlby 2005b; Siegel 2007; Siegel 2001). They see themselves as driving on an unsafe road; they develop their own internal maps and self-protective strategies to keep themselves from harm. For good self-regulation to develop, children need parenting with high control and high warmth, described as authoritative. These children have choices within boundaries; they are supported in their decision-making, anticipating cause and effect. They grow up within a supportive context in which they learn from experience

and modelling. These children show improved self-regulatory skill which supports emotional resilience, pro-social behaviours and sustained academic performance (Juang, Silbereisen 1999). These pupils are learning to drive, a skill for life.

Self-regulation is increasingly stable, yet remains contextually influenced

Longitudinal studies show that once acquired, self-regulation exhibits a trait like state (Rothbart et al. 2000a, 2000b). Whilst stable, it is not a fixed construct; self-regulation can increase or deplete in response to intrinsic or extrinsic influence particularly throughout childhood and adolescence. We might see this as pupils driving differently on different school roads. For example, a pupil may show a high level of self-regulation at home, but contextual factors at school may adversely influence her ability to self-regulate at school.

As the brain loses its plasticity in later years, self-regulation capacity is increasingly stable and less malleable. Older adolescents develop more organised patterns of behaviour which become socially reinforced (Bandura 1977b). They are harder to influence, just as we might see driving habits becoming increasingly entrenched over time. Baumeister describes self-regulation as a muscle which can strengthen in response to intentional activity (Bauer, Baumeister 2011). This suggests that pupils who struggle to self-regulate can develop these skills if given targeted support (McMunn et al. 2001; Masten 2004; Raffaelli et al. 2005). Our driving metaphor might illustrate this as purposeful driving instruction given to a pupil who is struggling to drive. Unfortunately, it may not be easy to offer that purposeful support. Children and adolescents with self-regulatory difficulties can evoke a frustrated, anxious, controlling response within their caregivers, culminating in a damaging bi-directional cycle. The very children who need to experience the best self-regulatory support and modelling often receive it least, leading to further entrenched patterns of poor self-regulation (Spinrad et al. 2007; King et al. 2013; Fabes et al. 2001).

Self-regulation: a protective factor in adolescence

Longitudinal studies show a strong correlation between pupils who self-regulate from an early age and subsequent emotional, social and academic competence (Trentacosta, C.J., & Shaw, D.S. 2009; Tangney et al. 2004; Colman et al. 2006). They are more able to manage strong emotions; they exhibit increased self-management and self-efficacy under pressure and stress, and are less likely to exhibit volatility or impulsivity.

Socially, they demonstrate a greater level of social competency and behave in a more pro-social manner. They deal with conflict and problems more effectively; they are more likely to adjust their response to the particular social situation and audience, and make wiser decisions around risk taking. Consequently, they experience greater peer social acceptance, are more popular amongst peers and are more likely to be given leadership opportunities. They exhibit increased self-management; they have healthy eating habits, more appropriate levels of alcohol consumption and use money more wisely.

As learners, they are more likely to exhibit executive control; they are more able to self-reflect, plan ahead, exhibit self-efficacy and metacognition (Wentzel et al. 1990; Zimmerman 1990; Simonds et al. 2007; Bandura et al. 2003; Bandura 2010; Bandura 1977a). They are more able to choose effective social and cognitive learning strategies; they exhibit appropriate levels of motivation, focus and drive, and cope more effectively with work related strain and pressure. Consequently, they exhibit sustained academic competency.

Conversely evidence shows children and adolescents with poor self-regulation have a heightened risk of developing internalised and externalised difficulties (Eisenberg et al. 2003; Eisenberg et al. 2000; Eisenberg et al. 2010;

Halberstadt et al. 2001; Hofer et al. 2010). Internalised difficulties include rumination and over control (Roelofs et al. 2009; Muris et al. 2001; Muris et al. 2004), social withdrawal (Eisenberg et al. 2010), depression and anxiety disorders (Buckner et al. 2009; Hirshfeld-Becker et al. 2008; Hirshfeld et al. 1992; Thapar et al. 2012), eating disorders (Cassin, von Ranson, Kristin M 2005; Kalavana et al. 2010), and self-harm (Dich et al. 2014). Externalising difficulties include impulsivity, poor social competency and anti-social behaviours, social exclusion, substance and alcohol abuse, emotional volatility, lack of inhibition, risky sexual behaviours, lower empathy and school disengagement (Crockett et al. 2006; Kelley et al. 2004; Leon-Carrion et al. 2004b; Muris et al. 2011; Lin, Tsai 2002; Chein et al. 2011a; Tangney et al. 2004; Luthar 2003).

The associated risks of over regulation and poor self-regulation

Over- regulation

We might assume pupils who exhibit a high level of consistent self-regulation are most equipped to make wise choices, and are more resilient. There are however risks associated with what might be described as *over- regulation.* A sustained high level of self-regulation can increase pupils' risk of future affective-social difficulties. Let us explore why.

Self-regulation is often described as *effortful control* (Eisenberg et al. 2000; Eisenberg et al. 2010; Hofer et al. 2010; King et al. 2013; Baumeister, Vohs 2013). It is volitional, conscious and purposeful; to self-regulate to a high level over a sustained period is costly and exhausting. Baumeister et al use the word 'depletion' to encapsulate the idea of a resource increasingly spent (Bauer, Baumeister 2011; Masten 2004; Muraven, Baumeister 2000; Vohs, Heatherton 2000; Vohs et al. 2008). They point to a decrease in self-regulatory capacity leading to depleted coping skills and the onset of internalising and externalising difficulties.

Our road metaphor illustrates this powerfully. Wise, self-regulating drivers, whilst aware and responsive, may sometimes drift into autopilot, particularly when driving a route they have driven many times before. Drivers who 'over regulate' are *constantly* monitoring and vigilant; they do not go into comfortable autopilot. They notice all the cues around them, continually adjusting their response. Imagine how tiring such vigilant, effortful driving must be.

Over regulating pupils are hyper-vigilant and self-monitoring.

Children and adolescents who over-regulate are highly self and socially monitoring; we might even describe them as hyper vigilant (Ickes et al. 2006; Leone, Hawkins 2006). Their self-regulatory skill makes them advanced drivers on the school road; they probably hold positions of responsibility; they may be socially skilled, providing support to those around them who are less so; they probably exhibit excellent learning skills. These skilled 'drivers' no doubt receive feedback which tells them how good they are at driving, which reinforces the pressure they put on themselves to continue excelling in this area. They may have additional responsibility because they manage so well, adding additional burden. Yet, the risk of over-regulating to this degree over a sustained period is a sudden depletion of self-regulatory capacity. This can manifest a sudden onset of internalised or externalised difficulty. Identifying who these pupils are is critical if we are to support healthy self-regulation and refrain from placing additional pressure that could lead to depletion.

It is important to note that some pupils may over regulate, yet they may not fit the description above. A small group of pupils may use their advanced social cognition and self-regulation in order to manipulate other people or social situations for their own advancement. Although these pupils are skilled self-regulators, they could not be described as wise (Meeks, T.W., Jeste, D.V. 2009; Meeks, Jeste 2009). Whilst their over-regulation does not pose a risk to self, it does pose a risk to others.

To explore the causes and associated risks of over-regulation, download the paper ' ***The causes and associated risks of a sustained bias towards over regulation'.*** You will find this on the teachers' resources section of the AS Tracking platform. A further academic paper to support the construct of over regulation is also available in the same resources section.

Contextual dysregulation

Dysregulation can be said to occur when a pupil's ability to self-regulate is adversely affected by contextual factors (Fishman 2008; Muraven, Baumeister 2000; Vohs et al. 2008). These factors may be located within a particular environment; for example, a pupil who is able to self-regulate out of school, yet when in school struggles to do so. This may be in response to a particular incident such as bullying, school anxiety or a particular peer dynamic. Our road metaphor might see these pupils able to drive well on one road, yet unable to transfer these driving skills onto the school road.

Dysregulation may also occur in response to a confluence of adverse factors that deplete a pupil's self-regulatory capacity. Factors might include loss, exam pressure or the onset of puberty (Blair 2010; Worden, Silverman 1996). Our road metaphor might see these pupils as able to drive, then suddenly though a confluence of concurrent factors - find themselves swerving across the road. If dysregulated pupils receive early, targeted and sensitive support, over time they regain their ability to self-regulate. They may even demonstrate enhanced resilience (Daniel, Wassell 2002). Having learnt to drive in adverse driving conditions, they are more able to drawn on these skills in further times of adversity (Eisenberg N. et al. 2006; King et al. 2013; Masten 2004). It is important not to be complacent, presuming that pupils will always 'bounce back'. During a time of dysregulation, pupils are more likely to develop unhealthy self-soothing and coping strategies which may be place them at risk, and become increasingly entrenched (Blair 2010; Bandura et al. 2003; Martínez-Íñigo et al. 2013; Masten 2004; Skinner, Zimmer-Gembeck 2009).

Pupils' self-regulatory capacity can be dysregulated by contextual factors.

A polar bias towards one affective-social response

Pupils who iterate the same affective-social response irrespective of the context could be said to exhibit a polar bias. Whilst other pupils observe the contextual cues, and purposefully adjust their response, these pupils do not. They may dismiss, ignore or misread those cues. Consequently, they habitually repeat the same response irrespective of the context. Our road metaphor may see these pupils as attentionally blind to the signposts or drivers around them. It is as if their steering is biased toward one direction, which prevents them from making the purposeful steering adjustments necessary to drive wisely.

Pupils with a polar bias misread or ignore the cue that ought to guide them in adjusting their responses.

Of course, younger pupils are more likely to exhibit polar biases. For many, those biases become increasingly moderated as they become more aware of the boundaries and signposts around them. They learn wider repertoires of behaviours from which they can select at different times. For some pupils, those thinking and behavioural biases become increasingly habitual, and part of their self-concept. Blyth and Traegar describe the self-consistency motive, in which events or feedback which does not fit with our self-concept is dismissed

(Blyth, Traegar 1983). These pupils, left to habituate these biases further develop increasingly fixed patterns of behaviour. The more they habituate these patterns of behaviour, the more others expect it of them, leading to negative social reinforcement (Bandura 1977b). They develop a smaller repertoire of behavioural choices and miss vital opportunities to develop rounded, healthy patterns of thinking and behaviour. This increases their risk of developing future affective-social difficulties.

On the AS Tracking teachers' platform, you will find a series of papers to support teachers' understanding of the causes and associated risks of a polar bias in each AS Tracking factor. Further academic papers which explore the academic provenance of each AS Tracking factor can also be found on the same resources site.

Self-regulation: an educational priority

If pupils are to be equipped for a world that is increasingly high opportunity and high risk, they will need more help than previous generations to make wise choices. If wise choices emanate from the ability to self-regulate, schools ought to reflect on how they nurture this skill in their pupils. We believe there are several questions to consider; they address both the individual and cultural aspects of self-regulation.

- *How can schools identify those pupils who struggle to self-regulate at an early stage, before they crash?*
- *How can schools target support in the areas where pupils are most struggling to self-regulate?*
- *How can schools track pupils' self-regulation over time, identifying changes in pupils' thinking and behavioural patterns?*
- *How can schools measure the impact of their school culture on pupils' ability to self-regulate?*
- *How can schools optimise their school culture to most support pupils' self-regulation?*

AS Tracking: a tool to support proactive, targeted and evidenced pastoral care

AS Tracking is a tool developed to answer these questions. Whilst schools have many tools to measure, support and track pupils' cognitive and academic development, it is less easy to measure, support and track pupils' affective-social development. Consequently, some pupils do not get the right support at the right time. AS Tracking identifies those pupils at an early stage who are developing limiting or unhealthy patterns of thinking before they lead to behavioural risks; it guides teachers in knowing how to signpost or model more rounded patterns of thinking and behaviour, and tracks pupils social and emotional steering over time, ensuring teachers are alert to subtle changes in a pupil's thinking. Sitting alongside teachers' professional judgement, it supports a level of pastoral care which is proactive, targeted and evidenced. It is this level of precision that will ensure pupils are better equipped to make wise choices as they steer the increasingly high opportunity, high risk road of adolescence.

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