Education Endowment Foundation

Social, Psychological, Emotional, Concepts of self, and Resilience outcomes: Understanding and Measurement (SPECTRUM)

A brief report of a conceptual mapping exercise

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Introduction

The purpose of this brief report is to present conclusions from a conceptual mapping exercise preceding a systematic review of measures, commissioned by the EEF to explore the current state of the field regarding measurement of a broad constellation of skills and attributes beyond those directly associated with academic aptitude.

The original scope of the work centred on 'character skills', but the conceptual domains[1] eligible for inclusion in the original scope of the work far exceeded the original parameters (see inclusion criteria below). As such, the broad constellation of skills and competencies encapsulated in this exercise are nominally referred to as '**SPECTRUM**' (Social, Psychological, Emotional, Concepts of self and Resilience: Understanding and Measurement). This term serves as both a descriptive acronym and a symbol of the broad range of skills and attributes encapsulated within the field. In addition, meta-cognition as a conceptual domain is included, as identified by Gutman and Schoon (2013).

As terminological ambiguity is a key issue in the area of SPECTRUM (Humphrey et al., 2011; Halle & Darling-Churchill, 2016) the need for clear conceptual criteria is paramount in order to inform subsequent search strategies and to organise resultant measures. A key consideration in conducting a review of measures is balancing scope and specificity. Too narrow a focus will result in missing domains and measures, whereas too wide a focus will create an unnecessarily unwieldy task, yielding irrelevant domains and measures. Following the presentation of the identified domains, we present recommendations for an optimal balance between scope and specificity.

Method

Relevant literature was derived from 4 main sources: (i) the authors' knowledge and understanding of the field; (ii) key literature identified by the EEF (specifically Gutman and Schoon, 2013); (iii) key public policy and literature from other organisations (e.g. Early Intervention Foundation); (iv) literature searches utilising relevant databases (e.g. PsycINFO) and journals.

Inclusion criteria

To be included in the mapping exercise, identified literature broadly met at least one of the following criteria:

1. Identified concepts are part of, or can be associated with, domains identified in the Gutman and Schoon (2013) review;
2. Identified concepts form part of an established conceptual domain (e.g. social and emotional competence) that has theoretical and/or demonstrable links to school outcomes or later life success such as labour market outcomes (i.e. skills recognised

[1]A conceptual domain is defined as a skill, behavior, competency, or attribute that is recognised in academic literature. A conceptual domain demonstrates 'terminological consensus' i.e. several authors and papers discuss the same array of skill, behavior, competency or attribute. Conceptual domains are often broad, and are partially defined by the inclusion of subdomains (i.e. separate elements that make a 'whole'). A good example is 'Social and Emotional Competency' which is widely agreed to describe the subdomains of self-management; self-awareness; social awareness; relationship skills; and responsible decision-making (CASEL.org).

as contributing to individual or aggregated economic performance – for instance, motivation is linked to greater productivity (Brunello & Schlotter, 2011);

3. Identified concepts do not directly encapsulate academic abilities or skills.

Relevant literature was organised on the following basis:

1. Identification of major conceptual domains within the literature

To qualify, several (i.e. 3+) outputs (i.e. papers or reports) discussing the same conceptual domain from more than one author needed to have been published (indicating that though originating from a single author or institution, there is some indication of uptake of the idea). Outputs had to be using the same broad phrases and terminology (i.e. emotional intelligence) to describe the same concepts (often cross-referencing each other, or a common originating reference). For instance, literature discussing mixed models of emotional intelligence will often cite Goleman's (1995) arguably seminal text. In this way, the terminology defining conceptual domains were derived from the literature. The number of available outputs varied, dependent on the conceptual domain identified (e.g. more than 20 outputs were identified relating to social and emotional competence, reflecting the popularity of research in this area in recent years, whereas 3 sources were identified for creativity). However, each domain was identified as established in terms of quantity of articles, relevance of journals (i.e. journals which publish a history of related material) and timescale of publication history (i.e. a track history of publications in which the same terminology is used consistently since the early inception of the domain).

2. Identification of subdomains

Conceptual domains are often broad, and are partially (or sometimes wholly) defined by the inclusion of subdomains (i.e. separate elements that make a 'whole'). A good example is 'Social and Emotional Competence' which is widely agreed to describe the subdomains of self-management; self-awareness; social awareness; relationship skills; and responsible decision-making (CASEL.org). Therefore, the next step involved using the literature (as above) to map out the components (i.e. subdomains) of the major conceptual domains. Examples of subdomains can be seen in Table 1 (page 9).

3. Identification of co-occurrence

Once conceptual domains and subdomains had been identified the literature was assessed for co-occurrence, whereby similar or identical descriptors of a conceptual domain were shared. For example: 'emotional self-awareness' is present as a facet in definitions of both 'trait emotional intelligence' and 'social and emotional comptence'. Literature was identified that provided evidence for each co-occurrence, providing descriptions of subdomains which were then compared and contrasted across conceptual domains. Co-occurrence can be considered a symptom of the lack of conceptual clarity in the field. Accordingly, co-occurring subdomains were kept within each of the numerous conceptual domains (for instance, 'emotional self-awareness' was kept in both the 'trait emotional intelligence' domain and the 'social and emotional skills' domain. This fed into the next step in the mapping exercise, which was to identify similarities between domains.

4. Identification of similarities between domains

Literature was also assessed for similarity, whereby domains did not share descriptors (as per co-occurrence), but there was a clear link between concepts (such that their conceptual similarity is likely to translate to empirical correlation) (see Diagram 1). Assessing both co-occurrence and similarity helps address the 'jingle-jangle fallacies' (Marsh, 1994). Jingle-jangle fallacies refer to the erroneous assumptions that two different things are the same because they bear the same name (jingle fallacy). For example, the term 'emotional intelligence' alone is not sufficient to distinguish between several diverse theoretical constructs. The jangle fallacy refers to instances where two identical or almost identical things are different because they are labelled differently; for example, 'emotional self-efficacy' and 'emotional literacy' are synonymous terms. Where possible, jingle facilities were addressed by distinguishing between two domains (e.g. specifying between trait, ability, and mixed models of emotional intelligence). Jangle fallacies were addressed by noting overlaps between conceptual domains (e.g. emotional intelligence and social emotional competence share many similarities, and therefore overlap in Diagram 1).

Findings

The resultant conceptual mapping of the identified domains (after accounting for co-occurrence and similarity) is shown in Diagram 1. Each major conceptual domain is identified as a 'bubble', with subdomains (as defined in pertinent literature) contained within. Some subdomains of major concepts (e.g. emotional intelligence) have been omitted for presentation purposes (see Table 1 (page 9) for list of subdomains). The size of each bubble currently reflects the space required to include example subdomains, rather than an indicator of its relative position or prevalence in the literature. Instances of co-occurrence are denoted as a 'Venn diagram' overlap. Where a major conceptual domain is not seen to relate to any other construct, it is not overlapped, and is positioned independently (e.g. cynicism). Dotted lines indicate evidence of similarity.

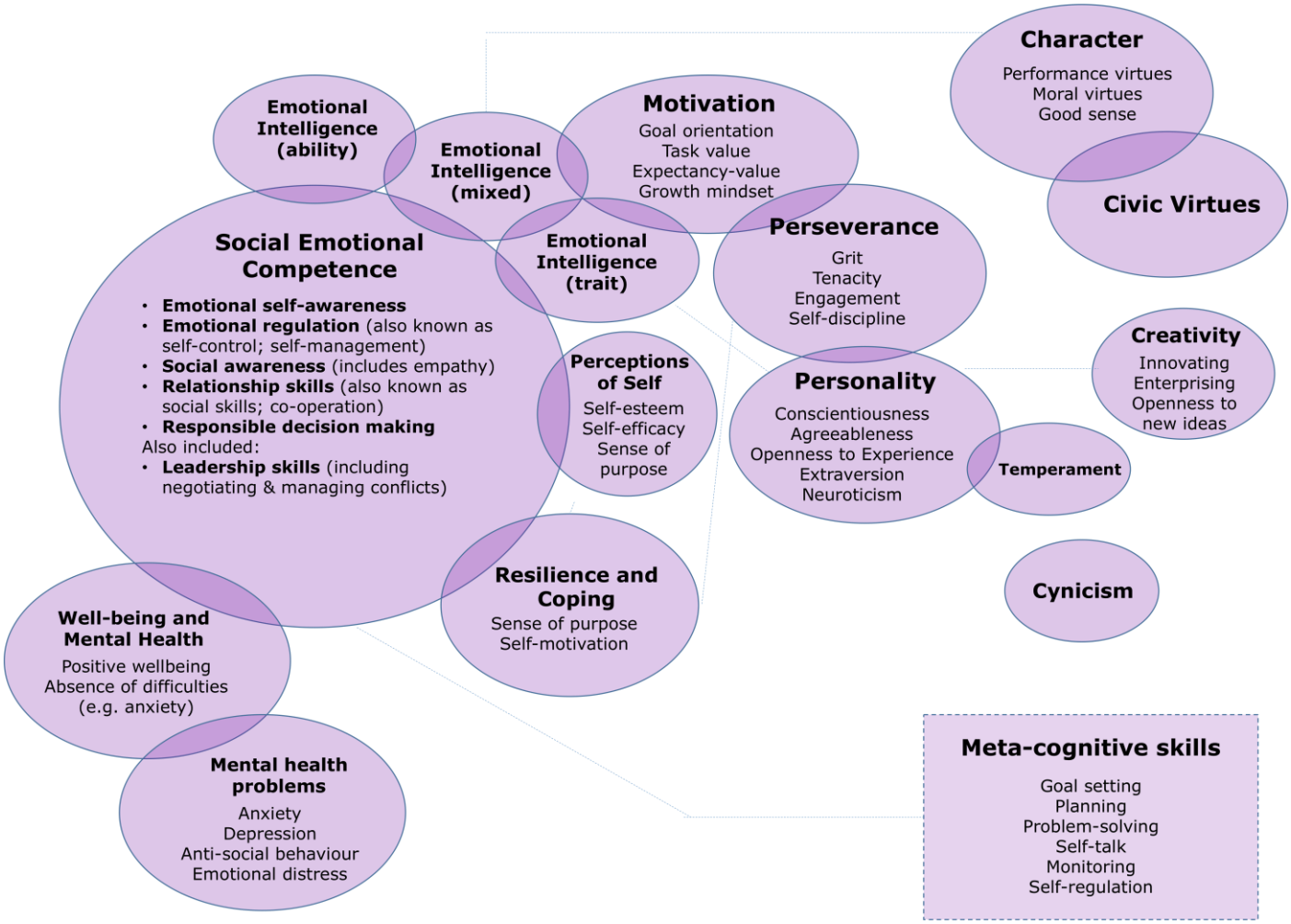

Diagram 1: Initial conceptual mapping of identified SPECTRUM domains

Discussion

The conceptual mapping exercise described above identified a large number of conceptual domains. Most domains share at least some co-occurrence or similarity, indicating a degree of overlap in the field (see discussion regarding jingle-jangle fallacies below). This is due in part to the wider and often (though not always) 'fuzzy' definitions used in the field. Although some major concepts domains were identified through a consensus regarding their definition (and accompanying subdomains), this was not always the case.

Major conceptual domains of higher order concepts often serve as broad 'umbrellas', encompassing multiple perspectives and concepts. A good example is 'mental health and wellbeing' in which there are several competing terminological discourses, affecting its definition and subsequent scope (see Weare, 2010, for a review). The uniting domain amongst a number of concepts is that of 'social and emotional competence'[2], reflecting not only its expansive definition but also its centrality in SPECTRUM literature. A summary of conceptual domains, including definitions and subdomains, are included in Table 1 (page 9).

One domain requiring additional consideration is meta-cognitive strategies. Although identified as a major conceptual domain in Gutman and Schoon's (2013) review, the definition of meta-cognition ("the processes used to plan, monitor, and assess one's understanding and performance", Bransford, Brown, & Cocking, 2000, p.18) can be directly attributed to learning strategies – an academic skill that does not clearly sit within the SPECTRUM rubric.

At a conceptual level, we propose that meta-cognitive strategies form a bridge between SPECTRUM and other academic competencies which may also be classified alongside meta-cognitive strategies (e.g. study skills). However, it is not considered to be included directly within the SPECTRUM rubric and is referred to separately as an adjunct to SPECTRUM. This ensures a clear conceptual framework for the identified domains (including meta-cognition itself) while at the same time identifying links between meta-cognitive strategies and SPECTRUM (e.g. the concept of 'self-regulation' is evident in both meta-cognition and social and emotional competence) and thus to consider the extent to which concepts are shared.

Another domain requiring additional consideration is that of 'mental health problems'. Although this domain might arguably be contained under the SPECTRUM rubric, there becomes a risk of "definition by exclusion" (i.e. 'not academic'). In addition, clinical-based measures of mental health are typically using as screening or indicated measures, designed to identify and track smaller populations (i.e. those displaying sub-clinical or clinical difficulties). This is in contrast to 'promotion-based' conceptual domains in the mapping exercise or the broad approach to EEF sponsored interventions. Instead, the presence of mental health difficulties suggests deficit-based models of treatment (e.g. clinical depression and/or anxiety).

There are many available measures included under this conceptual domain, as evidenced by Deighton et al. (2014). Searching for just 'measurement', 'mental health' and 'child', 117 measures suitable for children and young people under 18 were identified. Though reduced to a final selection of 11 measures, this was on the basis of strict psychometric criteria and

[2] We note a distinction between 'social and emotional learning (SEL)' (the process by which competencies are imparted) and 'social and emotional competence (SEC)' (the outcome of SEL, which we measure and assess) (Humphrey, 2013). Therefore, the term SEC is appropriate for the purposes of this exercise

implementation features. In a similar review, Kwan and Rickwood (2015) identified 29 measures suitable for 12-25 year olds. Although some of the measures may offer utility to the EEF (for instance, the 'KIDSCREEN', identified in both reviews, is used in the EEF PATHS study) many of the identified measures may not be appropriate. A good example is the Paediatric Symptom Checklist (identified by Deighton and colleagues), which provides an overall score of psychological impairment but does not provide a good means of detecting change (as most children should not score on this measure).

Fortunately, given the interest in child mental health difficulties, issues of measurement and assessment have received a relatively large amount of attention in comparison to other SPECTRUM domains, as evidenced by the availability of systematic reviews (e.g. Tsang, Wong & Lo, 2011; Deighton et al., 2014; Kwan & Rickwood, 2015). Accordingly, we have recommended excluding mental health difficulties from the systematic review. There is an option to draw upon already published sources to offer a shortlist of recommendations.

There is a good congruence between the 'bottom-up' approach taken in the current exercise and the conclusions drawn from available 'top-down' literature. For instance, Lipnevich and Roberts (2012) identify a similar taxonomy in which 'non-cognitive' factors are broken down into similar (albeit broader) categories, including: social and emotional qualities (clearly indicated in the current exercise); attitudes and beliefs (represented by the 'satellite' domains surrounding social and emotional comptence); and personality traits (also clearly indicated in the current exercise). Although validity is suggested by arriving independently at similar conclusions, both Lipnevich and Roberts and the current review note that categorisation of the identified terms can be seen as arbitrary, and may vary by discipline and perspective.

Regarding concerns over the jingle-jangle fallacies, although indicating overlapping domains helps address the jingle fallacy (same name, different idea), some further consideration is required. In particular, the ability of a domain to offer increased incremental validity (i.e. where a concept materially adds to our understanding of a domain) or little incremental validity (i.e. where a concept offers no additional understanding) ought to be given consideration. For instance, perseverance of effort ('grit') and the personality factor of conscientiousness are to a large extent the same trait (Rimfield et al, 2016) suggesting an occurrence of the jangle fallacy (different name, same idea). As personality has been seen to significantly predict academic achievement, grit offers little incremental validity once appropriate measures of personality have been used (i.e. low incremental validity). Conversely, ability EI has been shown to predict academic success in concurrent and longitudinal studies even after personality and academic intelligence are statistically controlled for (i.e. high incremental validity) (Gil-Olarte Márquez, Martin, & Brackett, 2006; Lyons & Schneider, 2005; Mestre, Guil, Lopes, Salovey, & Gil-Olarte, 2006; Qualter, Gardner, Pope, & Hutchinson, 2010).

For cases where conceptual domains share common conceptual and terminological subdomains (e.g. both Social and Emotional Competence and EI share the construct of emotional self-awareness), there is ambiguity as to which domain instruments measuring such constructs should belong. To counter these concerns, we recommend: (i) including incremental validity markers as part of the systematic review, where possible. This will allow consumers of the review to determine whether a particular instrument can increase usefulness beyond that provided by an existing measure (i.e. to what extent to two separate ideas overlap?). For instance, if measuring Social and Emotional Competence, is it also useful to measure emotional intelligence, or is there a risk of capturing most of the 'same thing' twice?

This will be shown in the online database under the categories of validity (e.g. criterion, concurrent and predictive) which indicate how accurate and unique a particular measure is in relation to its conceptual domain. To further counter issues of ambiguity, (ii) where appropriate we have recorded measures as belonging to more than one conceptual domain.

It is worth noting that there are variations in the quality of evidence presented for the prominence and inclusion of each major conceptual domain. Although all major conceptual domains have passed a minimal threshold for inclusion in this initial exercise (as described above), this does not reflect relative confidence or 'weight' of evidence underpinning each domain. For example, 'civic virtues' met minimal criteria but this domain has relatively little 'high quality' evidence (e.g. longitudinal and/or rigorous designs that allow inferred causality, with evidence based on representative and diverse samples) in comparison to some of the other, more central, conceptual domains.

We should also briefly consider malleability. The conceptual mapping does not indicate the relative stability and/or receptiveness to intervention of the SPECTRUM domains identified. For instance, personality and temperament show high degrees of stability even from an early age (Gaspar, 2001; Neppl, et al, 2010). As one of the intended purposes of the systematic review is to provide for likely instruments to be used as outcome measures in evaluation designs, major conceptual domains that show stability have been excluded (see table 2).

Therefore, in summary of the points discussed above, the conceptual domains identified in Diagram 1 were subject to the following inclusion/exclusion criteria:

- Identified as distinct, definable and amenable to measurement;
- Empirical evidence is available demonstrating a link between the conceptual domain and school-based or later life outcomes;
- Offers incremental validity – domains are distinct and offer contributions to school-based or later life outcomes above and beyond similar domains (see jangle fallacy). For instance, emotional literacy is a term typically used in England, however it offers little additional contribution once emotional intelligence (a term with a much more established literature base) is considered;
- Identified as malleable (i.e. can be the subject of intervention or change); and
- Likely to offer utility to broad-based, general populations of children and adolescents (i.e. not screening or clinically based deficit domains in which measures would otherwise present 'floor effects' (most respondents scoring zero).

Conclusions

The number of domains is currently very large in scope, as it currently incorporates arguably 'fringe' concepts, stable traits and domains subject to the jangle fallacy. On the basis of the relative weight of literature, centrality to SPECTRUM, and amenableness to intervention, we suggested carrying forward the following domains to the systematic review (also see Table 1 (page 9)): Motivation (incorporating goal orientation and perseverance given their thematic similarities – i.e. pursuit of goals); Emotional Intelligence (incorporating mixed and trait models); Social and Emotional Competence; Mental Health and Wellbeing; Resilience and Coping; Perceptions of self (incorporating self-esteem, self-efficacy, self-concept and other reflections of self). We also recommended that identified measures allowed to be categorised under more than one domain.

Finally, we recommended that a number of measures be excluded (see Table 2) and that conceptual domains with comparatively less rigorous evidence and/or relevance (i.e. creativity; cynicism; character; civic virtues; and mental health difficulties) were omitted from the review. Additionally, any domains that show high degrees of stability (i.e. Personality/ temperament; Ability EI) were also omitted.

Table 1. Recommended domains for including in the systematic review

SPECTRUM Domain	Broad-based definition	Definition (as identified from the literature)
Motivation, goal orientation and perseverance	How children and adolescents think, feel and behave in relation to pursuing goals. This includes how capable and engaged children and adolescents feel, and their attitude and sense of control when faced with challenges or setbacks	*Motivation*: The active pursuit of temporally extended goals involving high-level incentives (power, achievement, and affiliation) and assessing self-reported beliefs and goal striving behaviours. (Braver et al, 2014). *Goal orientation*: disposition toward developing or demonstrating ability in achievement situations (Pintrich, 2000). *Perseverance*: Passion for long-term goals – working strenuously toward challenges, maintaining effort and interest over years despite failure, adversity, and plateaus in progress (Duckworth, Peterson, Matthews & Kelly, 2007).
Emotional Intelligence (mixed and trait)	A measure of a person's skill in being aware of and managing their own emotions and being able to express them. This also includes skill in being aware of others' emotions and using this skill to build good relationships. Mixed: skills that are not located within other ideas about psychological functioning, and are instead a 'broad' indication of useful skills pertaining to interpersonal communication and 'life success'.	*Mixed*: The ability to identify, assess, and control one's own emotions, the emotions of others, and that of groups (Goleman, 1995). *Trait*: a constellation of emotional self-perceptions located at the lower levels of personality (Petrides & Furnham, 2001).

	Trait: skills that are part of personality and other similar elements such as impulsiveness and stress management.	
Social and Emotional Competence	Behaviours, thoughts and feelings related to how a person manages their own emotions and builds positive relations with others. This includes emotional awareness and regulation, relationship and social and skills, and using these skills to make responsible decisions.	The process through which children and adults acquire and effectively apply the knowledge, attitudes, and skills necessary to understand and manage emotions, set and achieve positive goals, feel and show empathy for others, establish and maintain positive relationships, and make responsible decisions (SEL.org).
Mental health and wellbeing	A very broad area that includes how children and adolescents feel in relation to positive ideas about normal functioning. For instance, that individuals feel happy, connected to others, confident, and able (and willing) to grow and learn.	There have been numerous attempts to create positively focused taxonomies of mental health skills, including self-understanding, the ability to manage emotions, motivation, resilience and optimism, having a sense of coherence, and the ability to make relationships and empathise with others (Seligman, 1996; Macdonald & O'Hara, 1998; Weare, 2000; NICE 2009).
Resilience and coping	Relating to a body of literature that views the child or adolescent as part of a wider eco-system (e.g. parents and community), resilience examines how capable an individual feels able to deal with difficulties or adversities, and how well they can identify and use support.	The capacity of individuals to navigate their way to health-enhancing resources and the capacity of individuals' physical and social ecologies to provide those resources in meaningful ways (Ungar, 2006).

Perceptions of Self	How an individual identifies themselves, specifically in relation to self-concept (e.g. what are they good or capable at), ideal self (e.g. what are they capable of becoming), and self-esteem (the difference between the two).	One's belief in one's ability to succeed in specific situations or accomplish a task (Bandura, 1977). Related to self-concept (constructed from the beliefs one holds about oneself and the responses of others) and self-esteem (evaluated and opinionated).
Meta-cognition	Relating to an individual's beliefs and skills in how well they think, plan and monitor their own learning. For example, how well they use strategies such as planning, and evaluating their own performance in relation to academic progress.	Goal-oriented efforts to influence one's own learning behaviours and processes by focusing awareness on thinking and selecting, monitoring, and planning strategies that are most conducive to learning (Zimmerman, 2001). Meta-cognitive strategies, for example, include setting goals, planning and problem solving, being aware of one's strengths and weakness, monitoring one's progress and understanding, and knowing when and why to use certain strategies (Pintrich, 2002).

Table 2. Domains recommended for excluding in the systematic review

Domain	Definition	Subdomains
Emotional Intelligence (ability)	The capacity to reason about emotions, and of emotions, to enhance thinking. It includes the abilities to accurately perceive emotions, to access and generate emotions so as to assist thought, to understand emotions and emotional knowledge, and to reflectively regulate emotions so as to promote emotional and intellectual growth (Salovey, Mayer, &; Caruso, 2004).	Accurately perceive emotions in oneself and others; Use emotions to facilitate thinking; Understand emotional meanings; Manage emotions
Reason for rejection: As a model of intelligence, EI is conceptualised as relatively invariant across the lifespan, limiting its use as an outcome measure for an intervention. In addition, ability-EI has received significant criticism due to difficulties in its accurate measurement. Ability-based EI measures, at best, measure emotion-related knowledge, as opposed to the underlying sub-set of intelligence they are supposedly based on (Freudenthaler & Neubauer, 2005; 2007). This difficulty severely limits the availability of assessment tools. There is arguably one measure of ability-based EI that is suitable for use with young people and adolescents - The Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT). However this instrument very long (141 items) and still undergoing development (Davis & Humphrey, 2012; Papadogiannis Logan, & Sitarenios, 2009; Rivers et al., 2012).		
Mental health difficulties	Changes in thinking, mood and/or behaviour that impair functioning (Murphey, Barry, & Vaughn, 2013).	Internalising (e.g. anxiety and mood disorders); Externalising (e.g. conduct and hyperkinetic disorders)
Reason for rejection: Although conceptually coherent within the SPECTRUM rubric, recommendations to exclude child mental health difficulties are based on 2 reasons: (i) Several recent systematic reviews already exist (Deighton et al., 2014; Kwan & Rickwood, 2015) risking duplication of effort; and (ii) the majority of measures are used to indicate psychological or behavioural impairment within normative samples, which may show a lack of sensitively of change for normative samples (e.g. use outside clinical or sub-clinical use such as in the evaluation of universal interventions).		
Personality/ Temperament	The combination of characteristics or qualities that form an individual's distinctive character, behaviour, thoughts, and feelings (Allport & Allport, 1921).	Openness to experience; Conscientiousness; Extraversion; Agreeableness; Neuroticism
Reason for rejection: Literature demonstrates a high degree of stability in personality, even from an early age (Gaspar, 2001; Neppl et al., 2010), limiting its relevance as an outcome to assess intervention effects.		
Creativity	Tendency to generate or recognize ideas, alternatives, or possibilities that may be useful in solving problems, communicating with others, and entertaining ourselves and others (Weisberg, 1993).	Creativity has been closely linked to Intelligence and Personality factors
Reason for rejection: Literature demonstrates few approaches to supporting empirical measurement of this construct.		

<table>
<tr><td>Cynicism</td><td>An attitude or state of mind characterized by a general distrust of others' motives.</td><td>Hostility
Machiavellian</td></tr>
<tr><td colspan="3"><u>Reason for rejection</u>: Although cynicism in adults has been linked to labour market outcomes (Stavrova & Ehlebracht, 2016), and individual differences can be seen in children (e.g. Mills & Keil, 2005), there is very little literature to indicate how this domain would operate as an essential skill within education. Cynicism can be seen to aid self-interest, but if children are not able to accept information at face value it has implications for the effectiveness of pedagogy as this is the major mode by which teachers impart knowledge. Similarly, low levels of cynicism could be described as ‘trusting’ or ‘gullible’, dependent on perspective. Further development of the literature is required before this domain can be recommended for inclusion within SPECTRUM.</td></tr>
<tr><td>Character</td><td>An interlocked set of personal values and virtues that normally guide conduct. Character is about who we are and who we become (Arthur, Powell & Lin, 2006).</td><td>Responsibility; Honesty; Self-reliance; Reliability; Generosity; Self-discipline; Sense of identity and purpose</td></tr>
<tr><td colspan="3"><u>Reason for rejection</u>: Applied to education, character is used to describe a broad constellation of ideals and values that are considered important in the development of children. As such, character does not form a distinct psychological construct by itself, instead drawing upon other already established conceptual domains (such as social skills), broad value statements (such as honesty), and educational approaches and content (such as citizenship). Indeed, difficulties in evaluating character education programmes have been noted because of difficulties in establishing suitable assessments for outcomes (Peterson & Skiba, 2001). As such character education may be viewed as an approach or process, rather than as an outcome, skill, or competence, and is therefore excluded from the review.</td></tr>
<tr><td>Civic virtues</td><td>Morality or a standard of righteous behaviour in relationship to a citizen's involvement in society (Jubilee centre for character and virtues, 2016).</td><td>-</td></tr>
<tr><td colspan="3"><u>Reason for rejection</u>: The conceptual mapping exercise was not able to identify sufficient detail to establish Civic Virtues as an empirically verifiable. Indeed, it has recently been argued by key authors in the field not only whether Civic Virtues can indeed be measured, but also that attempts to do so may be considered harmful (Siegel, 2014). This indicates that the domain is not currently sufficiently conceptualised to warrant inclusion within the systematic review.</td></tr>
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