

REVIEW SECTION

ACADEMIC SELF-CONCEPT IN TWICE-EXCEPTIONAL STUDENTS: WHAT THE LITERATURE TELLS US

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Abstract

This article explores the phenomenon of academic self-concept for twice-exceptional students. Twice-exceptional students typically have a lower than average self-concept. If this finding is extrapolated and applied to **academic** self-concept, the likelihood is that that will also be below average. Low academic self-concept can be the forerunner to psychosocial and behavioural issues with undesirable behaviours, such as being highly disruptive in classrooms, which is self-sabotaging for twice-exceptional students and frustrating for teachers, parents and caregivers. Various influences, both internal and external, shape academic self-concept, and these influences do not stand alone in their different domains, but rather interweave across all areas to create a dynamic and changing construct. The literature presented in this article reveals that for twice-exceptional students, the psychosocial problems that might exacerbate low academic self-concept as a result of low achievement include frustration, lack of understanding, fear of failing, lack of motivation, negative perfectionism, unsatisfactory peer and teacher relationships, motivation, negative school attitudes and a limited connection to school.

Introduction

Over the last twenty years the Australian education system has been gradually developing an understanding of giftedness and the support required for gifted students. However, despite increasing awareness, there is often community resistance and even hostility towards

intellectually gifted students (Gross, 2010) resulting from lack of understanding, poor teacher education, and ignorance of identification and support mechanisms for parents, teachers and communities. This situation contrasts sharply with generally favourable community feelings about student prodigies in areas such as music and athletics (Brody & Mills, 2005).

Students who are gifted and also have a learning disorder or disability (LD) are a paradox. The construct of giftedness has numerous definitions (Renzulli, 2005), often resultant from traditional intelligence testing (Litster & Roberts, 2011). Giftedness has been linked to intelligence, creativity, task commitment and analytical abilities (Renzulli, 2005; Sternberg, 2000). Gagné (2008) separates the two constructs of giftedness and talent. He holds that giftedness is not necessarily linked with talent unless specific conditions are met. Although there are many domains of giftedness including, for example, creative, social and perceptual (Gagne, 2008), this article is focused on intellectual giftedness when surveying the literature. A twice-exceptional student refers to an individual who simultaneously possesses both superior cognitive ability and a learning disability (Baum & Owen, 2004). Typically in many classrooms, twice-exceptional students often go unnoticed or are only partially provided for. Literature posits that a gifted student who has a recognised LD must be appropriately accommodated in school with scaffolding and appropriate support for their LD, whilst at the same time having an opportunity to work in their area of strength.

In 1988, after two years of inquiry into the education of gifted and talented children, an Australian Senate Select Committee reported that gifted and talented children were arguably among the most educationally disadvantaged groups in Australian schools (Commonwealth of Australia, 1988). Thirteen years later in 2001, another Australian Senate Committee delivered a report entitled *The Education of Gifted and Talented Children* (Commonwealth of Australia, 2001). This report found that very little progress had been made since 1988 in providing programs for gifted children and appropriate training for their teachers. The Committee made 20

recommendations for improvement, the vast majority of which remain unaddressed today.

There exists no legislation at federal or State levels in Australia enshrining, establishing or protecting the right of gifted children to an appropriate education or mandating teacher training on how to meet the special needs of gifted students. Most States have some form of gifted 'policy' on the websites of their education departments, but these policies are not mandated and their aspirational pronouncements do not appear in the process of being consistently implemented. They are mere policy and not law.

In Queensland, the State education department, Education Queensland, in January 2013 replaced its former gifted policy and action plan with a new policy statement, *Curriculum provision to gifted and talented students* (Education Queensland, 2013a). This policy in turn is allegedly clarified and amplified by a document entitled *Supporting information: Gifted and talented students* (Education Queensland, 2013b).

The new Queensland gifted policy includes pronouncements with respect to the identification of gifted students, differentiation of curriculum, subject acceleration and full-year acceleration, and extension and enrichment. It even purports to require that accelerated students must each now have an Individualised Learning Plan (ILP), and that the parents of gifted children must be consulted and an in-school team established for the purpose of implementing the various aspirational assertions contained in the policy. Interestingly, it recognises expressly (perhaps for the first time in this context) that a gifted student can also have a disability.

Yet, like all policy, the new Education Queensland gifted provisions are unenforceable. The document is mere policy and not law. As such, it can be ignored with impunity. By contrast, the situation in Australia with respect to students with disability is quite different. Policies addressing the needs of students with disability are supported by both federal and State legislation. Accordingly disability policies are enforceable in a way in which gifted policies are not.

At the federal level, the Disability Discrimination Act 1992 (DDA) (Commonwealth of Australia, 1992) prohibits discrimination in education and provides that students with disability must be able to access and participate in their education

on the same basis as students without disability. This legislation applies throughout Australia and to both public and private schools. The DDA is supported and clarified by subordinate legislation in the form of the Disability Standards for Education 2005 (Commonwealth of Australia, 2005).

Each State and Territory has its own anti-discrimination or equal opportunity legislation. In Queensland, for example, the Anti-Discrimination Act 1991 (ADA) prohibits discrimination in education on the ground of disability (therein called 'impairment').

The definitions of 'disability' in the federal DDA and Standards and of 'impairment' in the Queensland ADA are quite similar and very wide — arguably wide enough to encompass all the various learning disorders, medical conditions, developmental differences, physical conditions and mental health concerns which collectively comprise the second exceptionality of students identified as twice-exceptional.

The DDA and the Standards impose a positive obligation on schools and on State testing authorities, such as the Queensland Studies Authority, to provide reasonable disability adjustments for students with disability both for classroom work and for assessments. Such adjustments (formerly called in Queensland 'special provisions' or 'special consideration') are numerous, and may include measures such as additional time for exams, supervised rest breaks, access to a scribe or a laptop for written tasks, separate supervision, dimmed lighting, rescheduling of exams, alternative forms of assessment, and technological support in the classroom.

With respect to policies addressing students with disability, Education Queensland in January 2013 replaced its former disability policies with new policy statements entitled *Curriculum provision to students with diverse learning needs* (Education Queensland, 2013c) and *Curriculum provision to students with disability* (Education Queensland, 2013d.)

As in the case of the new Education Queensland gifted policy, both these disability-related policies are explained and expanded upon in a supporting information document entitled *Students with diverse learning needs* (Education Queensland, 2013e). The obligation to provide disability adjustments is contained in a separate

policy statement entitled *Assessment* (Education Queensland, 2013f).

Of course students with disability who are also gifted (i.e., twice-exceptional students) can rely on their entitlements under the above disability-related policies and legislation on the same basis as students with disability who are not gifted, and in that sense only, twice-exceptional children could be said to be supported by legislation — at least with respect to the disability, if not on the grounds of the giftedness. The fact remains, however, that there exists in Australia no legislation or generalised policy covering twice-exceptional students as a discrete category.

There is little Australian-based research to date which investigates twice-exceptional students, although Wormald's research (2011) has investigated teachers' perceptions of these students. A review of Australian and global literature in this field has shown no published research pertaining to the academic self-concept of twice-exceptional students.

Who are twice-exceptional students?

The premise that students can be twice-exceptional is generally accepted in the field of gifted education (Assouline, Foley Nicpon & Whiteman, 2010; Baum & Owen, 1988; Baum, 1984; Brody & Mills, 1997; Neihart, 2008; Nielsen, 2002). Sometimes twice-exceptional students are referred to as gifted with learning disabilities (GLD); however the term 'twice-exceptional' will be used throughout this article.

A twice-exceptional student would, using Gagné's (2010) interpretation of giftedness, possess superior natural abilities (called aptitudes or gifts), in at least one ability domain (e.g., intellectual or creative), to a degree that the individual is in the top 10% of age peers (Gagné's Differentiated Model of Giftedness and Talent [DMGT]). At the same time s/he would possess impairment in the processes that are related to learning, processing, remembering, or perceiving (Wormald, 2011). Assouline et al. (2010) listed various LDs that can be associated with twice-exceptional students, such as autism spectrum disorder (ASD), attention deficit hyperactivity disorder (ADHD), emotional disturbance such as anxiety or depression, developmental delay, writing difficulties, physical disabilities (such as hearing, visual, orthopaedic and other health impairments), speech and language impairments and brain injury.

Baum, Owen and Dixon (1991) identified three subgroups of twice-exceptional students. The first group is students identified as gifted who have subtle learning difficulties, which become apparent as the level of work undertaken at school increases in difficulty. The second group is those who are achieving at Year level but have been overlooked or unidentified as gifted or having a learning disability. The third group is students whose LD has been identified and who may have been placed in remedial programs, but whose giftedness is not recognised. Often teachers stop at the first label (Sousa, 2009) of either LD or gifted. The issues encountered by the subgroups of twice-exceptional students can lead to school underachievement and psychosocial problems (e.g., Foley Nicpon, Allmon, Sieck & Stinson, 2010). The identification of twice-exceptional students is considered to be problematic (Foley Nicpon et al., 2010) as research in the twice-exceptional field indicates that there is a limited understanding by teachers and professionals about twice-exceptional students and how to identify them (Foley Nicpon et al., 2010; Wormald, 2011). Inadequate programming and provisioning for both exceptionalities may lead to negative school experiences that underpin poor academic performance and negative psychosocial developments (e.g., Reis, Neu & McGuire, 1995, 1997; Reis, Joan & Terry, 2000).

Psychosocial support might reduce the risk of twice-exceptional students developing characteristics such as below average self-concept and self-efficacy, hypersensitivity, high levels of frustration, anxiety and self-criticism (Reis & Blacher, 2002). Such issues may lead to psychosocial problems, such as reduced self-concept and, consequently, underperformance in school (Assouline et al., 2010; Barber & Mueller, 2011; Vespi & Yewchuk, 1992; Baum, Olenchak & Owen, 1998; Dole, 2001; Reis et al., 1997). Over time, twice-exceptional students may use their creativity negatively and become disruptive and avoid tasks (Sousa, 2009; Vespi & Yewchuk, 1992; Assouline et al., 2010). Moreover, Baum and Owen (1988) observed that 36% of identified LD students also demonstrated gifted traits and, in addition, found that these students were the most disruptive in class as they felt less effective than their peers in their performance. In a study of '20 lazy children', LDs were diagnosed for the first time in 85% of the participants who showed clinical levels of anxiety, inattention and hyperactivity (Gilmore & Boulton-Lewis, 2009).

Self-concept in twice-exceptional students

There is no literature exploring the 'academic self-concept' of twice-exceptional students. To attempt to explore this phenomenon, this article will survey the literature regarding academic self-concept for both gifted students and LD students as this is the interface for twice-exceptional students. 'General' self-concept literature will also be included in an attempt to bridge this large gap in the literature. Improving the self-concept of gifted students is one of the most important issues that gifted education needs to address (Shi, Li & Zhang, 2008), so that all students reach their potential (Feldhusen & Hoover, 1986). Additionally when LDs are added to this construct, there is evidence that students have low 'general' self-concept (Beltempo & Achille, 1990; Cooley & Ayres, 1988). It would appear that twice-exceptional students face a double-edged sword as they have the low self-concept of both a gifted student and an LD student (Assouline, 2011; Barber & Mueller, 2011; Baum & Owen, 1988; Reis et al., 2000).

Dole (2000) suggests that the single largest factor that appears to differentiate the twice-exceptional group from gifted students is a sense of inefficacy in school, despite the creative potential of the twice-exceptional group. Their low academic achievement and disruptive behaviour can lead to school failure and social emotional issues, which is a large price to pay for overlooking a learning disability (Dole, 2000; Reis & Blacher, 2002).

What is self-concept?

Self-concept is a significant psychological construct (Shi et al., 2008), which is considered to be a multidimensional, multilevel structure that is domain specific. Bahr (2007, p. 138) states that 'self-concept is a term that refers to the knowledge we have of ourselves. We develop self-concept through interacting with the environment.'

Self-concept is divided into two main areas: social self-concept and academic self-concept. Social self-concept refers to perceptions about personal qualities, e.g., appearance, physical ability, interpersonal relationships. Academic self-concept is discussed below. In a meta-analysis of general self-concepts, Litster and Roberts (2011) found that gifted students, when compared with other students, had higher self-concept in intelligence, behaviour and reasoning and lower self-concept in other domains such as

physical ability and appearance. Conversely, in a meta-analysis of LD students' self-concept, Bear, Minke & Manning (2002) found that LD students had lower academic self-concept.

Shavelson, Hubner and Stanton (1976) argue that self-concept is gradually formed over time and is founded on an individual's experiences and interpretation of these experiences. This argument is underpinned by Festinger's (1954) social comparison theory regarding how students use frames-of-reference to assess themselves, and their strengths and weaknesses.

Research regarding self-concept in the gifted has produced mixed results, with some studies showing that gifted students have higher self-concept than other students (Elmore & Zenus, 1992; Mulcahy, Wilgosh & Peat, 1991; Pyryt & Mendaglio, 1994; Yong & McIntyre, 1991; Li et al., 2004). It has been argued that self-concept is the most important attribute for gifted students to recognise their own potential (Feldhusen et al., 1986). Chen, Peters and Moenks (1997) found a positive correlation between self-concept and IQ; however, being gifted does not assure positive self-concept (Klein & Cantor, 1976). Gifted students are more likely to have emotional issues that may negatively impact self-concept (Litster et al., 2011).

Academic self-concept

Academic self-concept (ASC) relates to students' perceptions of their academic accomplishments, academic competence, expectations of academic success or failure, and academic self-beliefs (Marsh et al., 2008). ASC reflects students' perceptions of specific and general academic achievements (Bahr, 2007), and includes emotional reactions to academic domains. It can influence a student's attitude to school (Marsh & Hau, 2003), and can also vary between academic subjects. Self-concept and achievement motivation can be the most important factors in school achievement (Liu, Guo & Wang, 1991), but self-concept plays the larger role.

Bong and Skaalvik (2003) suggest that general self-concept predicts emotion, motivation and performance. High ASC results in high achievement motivation, involvement in school and academic achievement (Xin & Hao 2003). ASC has been shown to affect one's educational aspirations (Davis, Rimm & Siegle, 2011), academic interest (Marsh, Hau & Craven, 2004; Marsh et al., 2008), course selection (Marsh & Yeung 1997a), and achievement over time

(Marsh & Yeung 1997b). Shi et al. (2008) conducted a meta-analysis of research carried out on the connection between self-concept and academic performance. In general, it appears that students with high self-concept demonstrated higher motivation, school connection and academic achievement.

There are externalised, environmental influences affecting ASC but there may also be an internal locus of control that influences ASC and academic performance. Assouline, Colangelo, Ihrig, & Forstadt (2006) published a study which found that gifted students are more likely to attribute academic failure to lack of work effort rather than lack of ability. Both aspects of environmental and internal influences on ASC can be explored by looking at the literature in two areas. The internal influences are explored through internalised frames-of-reference regarding academic achievement, mastery of experience, enjoyment, self-understanding, psychological centrality and self-talk. Externalised frames-of-reference are investigated through, for example, the big-fish-little-pond effect, whereby students compare themselves with those around them, significant others and environment. Age and gender also shape ASC (e.g., Zeidner & Schleyer, 1999; Shi et al., 2008). These influences do not stand alone, but interweave across all areas to create a dynamic and changing construct. Research pertaining to these different influences will now be described with internalised frames-of-reference being explored first.

Internalised frames-of-reference

Academic achievement

Effects on ASC are complex but research appears to be supporting a 'reciprocal effects' model in which ASC both affects and is affected by academic achievement. Academic achievement levels can be influenced by, for example, compensatory learning (whereby a student's learning needs are scaffolded), teacher talk, self-talk, self-esteem, self-efficacy, enjoyment levels (Bong & Skaalvik, 2003) and school relationships. Academic successes in specific domains reinforce ASC in those domains and lead to autonomous academic motivation that in turn enhances academic achievement in those domains (Guay, Ratelle, Roy & Litalien, 2010). Educators often falsely believe that academic accomplishments alone contribute to academic success, but ASC also relates to emotional reactions to academic domains and academic experiences, so that previous academic success is

positively related to high ASC (Hampton & Mason, 2003).

ASC is domain specific (Bong & Skaalvik, 2003) and the self-perception of the key competence areas results in increased motivation and learning within that domain: 'Academic self-concept is an evaluative self-perception that is formed through students' experience and interpretation of the school environment' (Guay et al., 2010, p. 644).

Influences on ASC change as a student progresses through school. In primary school, educational and school achievement affects ASC (Guay, Marsh & Boivin, 2003). However, Guay et al. (2003) state that this is reversed in middle school and that ASC affects achievement. In addition, a study of middle-school students in Years 6 and 7 linked depth of learning to school relationship and ASC (Burnett & Proctor, 2002). The 'skill development model' for the early years and then the 'self-enhancement model' can demonstrate these two positions for the middle years and beyond (Guay et al., 2003).

Mastery of experience and enjoyment

The old adage that 'practice makes perfect' is relevant here but has to be considered alongside the supposition that a gifted student will need less practice for mastery in their area of giftedness (in this article, intellectual giftedness) and that too much repetition can have a negative effect on learning (e.g., Gallagher, Harradine & Coleman, 1997). However, for those students with LD, this practice will also need appropriate support and scaffolding for the LD so that the students can develop their areas of cognitive strength. Students are more inclined to practise and master a skill if they also enjoy it. The enjoyment aspect can stem from the emotional reactions when faced with a task — maybe a visceral reaction when having to tackle maths or write an essay.

Psychological centrality, self-understanding and self-talk

If there are no interventions at school for twice-exceptional students, they may experience psychosocial issues, e.g., anxiety, hyperactivity, depression, inattention, disruptive behaviour, withdrawal and low academic success. Although the gifted are a diverse group, gifted and twice-exceptional students share common characteristics. The literature reveals that gifted students may have personality characteristics such as perfectionism, excitability, sensitivity, intensity, a desire for recognition of academic

achievement, nonconformity, questioning of rules or authority, a strong sense of justice, and idealism (Lovecky, 1992; Silverman, 1993b; Sowa, McIntire, May & Bland, 1994; VanTassel-Baska, 1998). These characteristics can also create social and emotional difficulties in school. Gifted or twice-exceptional students may feel detached or isolated from their age peers. They may experience difficulty with self-regulation and therefore develop unique socio-emotional needs.

School experiences, owing to late or non-identification of giftedness and/or LDs, can give rise to psychosocial issues pertaining to anxiety and depression. If the student is unidentified, there will be frustration as a result of limited self-understanding. Lack of, or late identification of, either or both exceptionalities can have a negative impact on the student (e.g., Dole, 2001; Vespi & Yewchuk, 1992; Olenchak, 1995). In some areas of school, students may be bored and disengage as their gifted self might be some years ahead of their age peers. In other areas of school, they might be over-challenged, unable to cope and struggling to compensate for the weaknesses in their LD self (e.g., Assouline et al., 2010; Hannah & Shore, 2008; Ferri, Gregg & Heggoy, 1997). If the student has no knowledge of either exceptionality, s/he may feel isolated, misunderstood and depressed or anxious (e.g., Coleman, 1992; Reis et al., 1995, 1997, 2000; Vespi & Yewchuk, 1992). Behaviours might include disruption, disengagement, poor performance, perfectionism and symptoms of anxiety (e.g., Baum & Owen, 1998; Moon, Zentall, Grskovic, Hall & Stormont, 2001). Baum and Owen (1988) found that twice-exceptional students were the most disruptive in class. The focus on the disability without the outlet for the giftedness, it appears, leads to frustration, tension and low academic self-efficacy. Disruptive behaviour in twice-exceptional students has been identified and supported in other empirical studies in both the quantitative domain (e.g., Barber & Mueller, 2011; Assouline, Foley Nicpon & Whiteman, 2009; Assouline et al., 2010; Baum & Owen, 1988) and the qualitative domain (e.g., Vespi & Yewchuk, 1992; Dole, 2001; Reis et al., 1997).

Assouline et al. (2006) found that academic success in gifted students was due, in part, to attributional choices. They were more likely to attribute failure or underachievement to not working hard enough or task difficulty rather than to not being smart. The limitation of this study was that all of the students had been

identified as high-performing gifted and had been selected for a gifted summer program, having already experienced some success in the academic domain. However, it would be interesting to investigate how twice-exceptional students would attribute perceived failure. Twice-exceptional students may not attempt to succeed for many reasons including perfectionism (with the perceived inability to commence or complete work) or the fear they will be 'discovered' as being of low ability. Perfectionism can be present alongside behaviours such as aggression, hyperactivity and low motivation, which is particularly unfortunate as Vespi & Yewchuk (1992) also found that twice-exceptional students have a great capacity for motivation and confidence.

Researchers have found variable social and emotional functioning amongst twice-exceptional students (e.g., Neihart et al., 2002). Some researchers suggest that these students are, at the very least, in the normative range and coping well. Coleman (1992) suggests that owing to their high cognitive characteristics, twice-exceptional students adapt quickly and adopt coping mechanisms that help them to deal with the significant school stressors. Dole (2001) also found that positive self-identity in twice-exceptional students was related to self-advocacy and self-determination. However, there was no comment about ASC.

Self-understanding and self-acceptance are important to twice-exceptional students and identification is consequently critical. Dole (2001) discovered positive self-perceptions for students in a study where students' positive self-identity was enhanced by strong support systems, involvement in extra-curricular activities, self-knowledge and self-advocacy. More adverse outcomes for students can include youth suicide (Svetaz, Ireland & Blum, 2000) and substance abuse (Beitchman, Wilson, Douglas, Young & Adlaf, 2001). Studies specific to gifted students have found that up to 20% of high school dropouts are gifted (Rimm, 2006). Although these studies have not been directly linked to twice-exceptional students, they highlight the fact that there are risk factors for both gifted students and LD students and that these risks may be greatly enhanced when combined within twice-exceptional students.

Externalised frames-of-reference

The external influences on ASC for twice-exceptional students do not stand alone and are

intrinsically interwoven with other influences such as the big-fish-little-pond effect, significant others, and environment. In addition, the two inherent influences of age and gender will be explored.

Big-fish-little-pond effect

Although this research has focused on gifted or general class cohorts, Marsh et al. (2008) used the big-fish-little-pond effect (BFLPE) to predict how equally able students have differing ASCs and academic achievements. The concept of 'self' cannot be adequately understood unless considered against an individual's frames-of-reference. BFLPE has been replicated globally (Coleman & Fults, 1982; Li & Shi, 2005; Marsh & Hau, 2003; Marsh, et al., 2004; Zeidner & Schleyer, 1999) and suggests that students use social comparisons in their class to establish their ASC. Marsh et al. (2008) found that equally able students had lower ASC when in a class with high-ability peers, and higher ASC when in a class of average-ability peers. Their research implies that there is an increasingly negative impact on ASC the longer a student remains in a high-average ability grouping.

However, Dai and Rinn (2008) suggests that the BFLPE might be a short-term, transient effect. It is argued that the primary theoretical basis for BFLPE is social comparison theory and that people generally use a variety of comparison criteria to best serve their self-evaluation. Dai and Rinn also argue that the findings on ability grouping in regards to contextual effects and ASC are mixed. Hattie (2002) conducted a meta-analysis of ability grouping, ASC and academic research, finding that ability grouping appeared to have very little effect on high-ability students, and none on low-ability students. However, this result was not supported by Shi et al. (2008), who found that the most positive effect of ability grouping was on the gifted students. Conversely, Hattie (2002) suggests that this result could be due to better educational practices, higher quality teachers and better resources.

Mixed findings for gifted programs led researchers (Marsh et al., 2008; Hattie, 2002; Dai & Rinn, 2008) to suggest that the consequences of involvement in gifted programs were more complex than that suggested by BFLPE theory alone. However, Marsh et al. maintain that gifted education factors have muddied the water and that BFLPE is relevant. Gross (1997) argues that for gifted students, academic self-esteem is linked to students' motivational orientation towards intellectual challenge and learning,

rather than towards a sense of superiority over their class peers: 'If big fish are placed in ponds that are too small for them, and if they are kept there too long, they stop growing' (Gross, 1997, p. 29). The downward shift in ASC experienced by some students is a result of engagement in a more realistic appraisal of individual abilities (Gross, 1997).

McFarland and Buehler (1995) found that BFLPE was more evident among students who value a social group to which they belong and BFLPE was even stronger if there was a weak emotional bond to the social group. Shi et al. (2008) suggest that at age thirteen there is a reduced academic and social self-concept in all areas and so this phenomenon might not be due to BFLPE but rather to a general trend in all students, which is further amplified in gifted students.

In the context of twice-exceptional students, the BFLPE theory may return dichotomous and confusing feedback. This may be particularly enhanced if one or both of the exceptionalities remain undiagnosed. Ruble and Flett (1988) found that high ability students were more likely to engage in self-evaluative information seeking and autonomous comparison, which would not support BFLPE theory. In contrast, students of low to medium ability showed consistent interest in social comparison owing to uncertainty in their levels of ability that become part of the foundations of ASC. The contrast between the high and low ability findings may have significant effects on a twice-exceptional student who attempts to manage both aspects.

Significant others — relationships, teacher talk, environment

In the context of significant others, the area of relationships (including those with teachers) and environment will be explored. A study investigating self-talk and general self-concept (Burnett & Proctor, 2002) found that negative statements made by teachers were predictive of negative self-talk for boys and reduced self-concept in maths for girls. Teacher positive statements led to positive self-talk in boys and positive self-concept in maths for girls. In a study on self-talk, Burnett and Proctor (2002) found that positive teacher statements indirectly led to positive self-talk and pro-social skills which had a positive effect on ASC. Craven et al. (1991) also found that teachers had a positive influence on self-concept through the enhancement of the school relationships.

Assouline et al. (2006) suggest that recognising causal attributions can assist educators to understand motivation in the academic environment; a strong identity from being smart or good at something relates to a positive ASC in that area. However, on the other side, negative outcomes might occur if experiences of failure are attributed to lack of ability and lead to lack of motivation: 'If I'm no good at it, why should I try?' (cf. Dai, Moon & Feldhusen, 1998; Dweck, 1986; Weiner, 1985). Assouline et al. (2006) suggest that realistic attributions for successes are important, as mis-attributions may lead to negative outcomes including underachievement.

Social relationships

The focus on a student's LD rather than his/her gift (particularly if the twice-exceptionality has been identified late) may increase negative school experiences, interactions and low self-concept (Reis et al., 1995, 1997, 2000; Vespi et al., 1992). Reis et al. (1995, 1997, 2000) explored negative school experiences and found they were often associated with peer problems, negative teacher interactions, and difficulty reconciling giftedness with LD due, in part, to late identification. Vespi and Yewchuk (1992) found that twice-exceptional students present inconsistent social skills and frustration with peers that can lead to feelings of failure, depression, low self-efficacy and worthlessness and negative perfectionism. Davis et al. (2011) identified studies showing that peers in the regular classroom do not often accept mainstream students with disabilities, particularly emotional disturbances. This lack of acceptance may be due to underdeveloped social skills that lead to unsatisfying teacher and peer relationships.

Assouline (2011) suggests that investigating adaptive behaviour and executive function can reveal important distinctions with social difficulties and self-concept. Perceptions about social skills may vary and correlate with the level of giftedness (Neihart, 1999). Assouline et al. (2009) investigated the differences between a gifted and a twice-exceptional student with concomitant social impairment (which is indicative of the gifted student) and social difficulties (which can be indicative of highly gifted students). The twice-exceptional student believed that her weakness was in daily self-management whereas the gifted student reported her weaknesses as social stress, interpersonal relationships and dislike of school. The striking results were evident when the students' reports were compared to the parent and teacher

assessment (Assouline et al., 2010). The parent of the twice-exceptional student perceived difficulties with social skills, communication, daily living skills, hyperactivity and attention problems. The teacher also reported aggression, depression, attention problems, withdrawal and social problems. These results are typical of students with ASD (Assouline et al., 2010) and indicate that their self-concept perceptions are very different from those of their carers. In contrast, the gifted student's parent and teacher report were similar to her own report.

This finding is consistent with some of the literature, which indicates that gifted students are emotionally well adjusted and aware of their limitations and social environment (Neihart et al., 2002). However, other studies posit that gifted students can have social and communication issues (Assouline et al., 2009; Assouline et al., 2010) and this gifted trait may also be evident in twice-exceptional students.

Self-concept can also be lowered when students experience rejection, labelling, low teacher or student expectations and poor social acceptance, leading to psychosocial issues and low performance. As performance is linked to ASC, early support addressing potential problem areas is important, particularly before an ingrained pattern can form. Davis et al. (2011) state that appropriate gifted programming can improve students' sense of worth, particularly those twice-exceptional students who should also be recognised for the effort required to overcome difficulties. In addition, social skills might need to be explicitly taught to twice-exceptional students, as students without disability use all of their senses and their mobility to learn social skills and can enhance peer acceptance. Foley Nicpon et al. (2010) suggest that these studies provide further evidence that an individualised approach is necessary when addressing the psychosocial needs of twice-exceptional students.

Age

The development of self-concept is not an ascending straight line but includes peaks and troughs throughout the formative years. It is suggested that throughout primary school, self-concept increases (Freeman, 1992) but then decreases into middle school. Marsh (1988) administered a self-description questionnaire to thousands of students and identified a marked decrease in self-concept in Years 7 to 9. After Year 9 the self-concept increases again into Year

12. Zhou & He (1996; cited in Shi et al., 2008) further supported this research and found the lowest point for self-concept was ages 13 and 14. Shi et al. (2008) also found that even though all students have a lowered self-concept between ages 9 and 13, gifted students' self-concepts were much lower. Tong and Yewchuk (1996) did not find any significant differences between gifted and other students' self-concepts. This result was supported by Shi et al. (2008) for just one age group: students aged 11. Other studies using self-concept questionnaires showed that self-concept was lowest at age 13 (Shi et al., 2008), perhaps owing to specific changes in physical, emotional and brain development during adolescence (Bahr, 2007).

With increasing time in school, general self-concept becomes increasingly less identified with academic performance (Steele, 1992). This finding could also relate to middle years and beyond and is termed 'academic dis-identification'. Steele found that this was especially pronounced if there was low academic performance. In a study using 283 students Shi et al. (2004) also found that lowered self-concept in general was due to age and not giftedness.

Gender

Self-concept, it appears, is also influenced by gender. Zeidner and Schleyer (1999) found that in mixed-ability classes, girls had higher social self-concept and lower academic self-concept compared with boys. It was also found that in homogeneous gifted classes, boys had higher self-concept across both the social and academic domains. In a study of university students there was no gender difference found in self-concept (Greenwald & Farnham, 2000), possibly as the participants were young adults and not experiencing the developmental, social and emotional influences of those in the middle years where lower general self-concept is reported. By contrast in China, Shi et al. (2008) found that gifted females had higher self-concept in every domain to significant levels owing, it was suggested, to a cultural aspect in that the predominance of male students and the value placed upon these students have led to learned helplessness in boys and lower overall self-concept. This reinforces Bahr's (2007) statement that self-concept has a significant cultural reference.

Sullivan (2009) found that ASC is highly gendered but this study used statistics for baby-boomers and must be considered against the backdrop of the era. Sullivan (2009) found that

boys had a higher ASC in maths and girls in English (and subjects requiring a strength in verbal intelligence). Single-sex schooling reduced the gender gap in ASC. However, selective schooling reduced ASC overall due to higher frames-of-reference, thus supporting the BFLPE (Marsh et al., 2008).

Conclusion

The rich field of academic self-concept has a gap in the research for twice-exceptional students owing, in the first instance, to the difficulty in identifying these students and, secondly, to an apparent decrease of research in the field. Bong and Skaalvik (2003) hypothesise that there is a need to separate the multiple components of ASC for more focused research to be possible. They suggest that academics have disengaged from this multi-faceted construct as presently, and that 'the dominant view of academic self-concept is that it is a collection of a host of related perceptions: competence, self-worth, interest, enjoyment, intentions, to name but a few' (p. 29).

Current research highlights a relationship between ASC and students' psychosocial well-being. For a twice-exceptional student, low achievement may diminish ASC. The psychosocial consequences of low achievement include frustration, lack of understanding, fear of failing, lack of motivation, negative perfectionism, unsatisfactory peer and teacher relationships, negative school attitudes and a limited connection to school. For a twice-exceptional student, the two relative aspects of high ability and barriers to accessing that ability, within one person might have conflicting repercussions, particularly if one or both of the exceptionalities have not been diagnosed or provided for.

ASC for twice-exceptional students is currently only conjecture given that there is a gap in the research. Speculation and inference about twice-exceptional students' ASC can currently be drawn by reviewing the literature pertaining to ASC in gifted students and LD students. Inferences might thus be drawn regarding how these findings might intersect within the twice-exceptional student.

Exploration of the wide-ranging factors affecting ASC is necessary to address the issues. The two aspects of environmental and internal influences need to be investigated. After a meta-analysis of the research in the twice-exceptional field, Foley Nicpon et al. (2010) have recommended future

research to include the identification of twice-exceptional students and the overarching issue of the masking phenomenon which would assist educators to identify and support twice-exceptional students. Future research should also investigate how psychosocial influences bridge ASC and academic achievement for twice-exceptional students.

Internal influences might include internalised frames-of-reference of academic achievement, mastery of experience, enjoyment, self-understanding, psychological centrality and self-talk. Externalised frames-of-reference are, for example, the big-fish-little-pond effect, significant others and environment. Age and gender also shape ASC. These influences do not stand alone in their different domains but interweave across all areas to create a dynamic and changing construct. Research reports varying results for the ASC pertaining to gifted students and LD students.

Misattributions and low motivation associated with LDs and a low ASC, juxtaposed against the high ability or gifted aspect and potentially high ASC of a twice-exceptional student, could lead to paradoxical psychosocial consequences. These issues are enhanced if twice-exceptional students' giftedness is not recognised and they are excluded from their gifted peers' programs, potentially leading to social isolation and crippling emotional issues. Twice-exceptional students are often not identified early in their school experience and therefore academic and psychosocial patterns can become deeply ingrained. Practices in education, minimal advocacy and gaps in the research further exacerbate the complexities that twice-exceptional students face.

Recognition and remediation for twice-exceptional students in school will have positive consequences pertaining to ASC, school experiences and psychosocial outcomes. These consequences will support advocacy, which can influence policy, school and student support in education. Research is needed to investigate how psychosocial influences bridge ASC and academic achievement in the context of twice-exceptional students.

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