ISSN: 2148-9955

International Journal of Research in Education and Science (IJRES)

www.ijres.net

The Big-Five-Personality and Academic Self-Concept in Gifted and Non-Gifted Students: A Systematic Review of Literature

Colin Peperkorn, Claas Wegner
Bielefeld University, Germany

To cite this article:

Peperkorn, C. & Wegner, C. (2020). The big-five-personality and academic self-concept in gifted and non-gifted students: A systematic review of literature. *International Journal of Research in Education and Science (IJRES), 6*(4), 649-667.

IJRES International Journal of Research in Education and Science
Volume 6, Issue 4, Fall 2020 ISSN: 2148-9955

The Big-Five-Personality and Academic Self-Concept in Gifted and Non-Gifted Students: A Systematic Review of Literature

Colin Peperkorn, Claas Wegner

Article Info

Article History

Received:
18 May 2020

Accepted:
04 September 2020

Keywords

Systematic literature review
Personality
Self-concept
Gifted students
Gifted education

Abstract

Gifted students provide interesting opportunities for careers in all professional areas. To benefit from that chance, the promotion of gifted students moves more and more into focus of educational research and becomes an important facet of today's teachers' professional competencies. To meet these requirements, teacher training courses must be offered which are based on current state of research. This article presents a systematic literature review which investigates the current research state regarding quantitative studies of gifted students' personality and self-concept. To assess a comparable state of research about the personality of gifted students the Big-Five model of personality was considered as a criterion for admission. A total of 40 quantitative studies was included. Results for personality of gifted students show that there are only a few studies which deliver comparable and valid data. Gifted students' academic self-concept seems well researched, but indications of a multilayered subject specific academic self-concept receive little attention. Recommendations include a higher focus on students gifted in specific subjects, to find valid implications for their individual promotion.

Introduction

For centuries, philosophers and ancient folklore postulated that there is a touch of genius in madness and vice versa, and that creativity requires a certain dose of madness (Barrantes-Vidal, 2004). Before accurate assessments of mental capabilities in research were available, a majority of researchers conceded with the assumption that giftedness was connected to developmental disorders and psychological aberrations (Freund-Braier, 2009; Rost, 1993). These socio-emotional disorders were often referred to as the "genius-madness-correlation", as scientists observed such a large coincidence and continuity (Lombroso, 1895; Gallagher, 1990). Although this perspective remains deeply rooted in public belief and is now known as *disharmony theory*, modern research postulates the opposite (*harmony theory)*, which assumes that giftedness is not linked to particular mental disorders, results in social flexibility and even lends itself to pursuing a more successful career (Plucker & Callahan, 2008; Sternberg & Davidson, 2005; all cited in Wirthwein et al., 2019).

Today, the International Panel of Experts for Gifted Education (2009) has defined giftedness as both an individual's overall ability to perform and increased potential being fostered. However, this is no longer simply tied to tested intelligence but other factors such as the willingness to perform, interest, discipline, self-confidence, and self-control abilities (iPEGE, 2009). Recently, a new field of research has emerged to explore personalities in gifted students; it has become necessary to investigate potential diagnostic tools and use this information to train teachers to better suit the needs of their students (Wirthwein et al., 2019). One of the most widely known models to describe personality is the Big Five personality traits model, which has consistently been used to demonstrate and refer to the connection between intelligence and individual factors (Ackerman & Heggestad, 1997; DeYoung, 2011; Digman, 1990; Goldberg, 1981; Limont et al, 2014; Mammadov, 2018; McCrae & Costa, 2008; McCrae et al., 2002; Poropat, 2009; Wirthwein et al., 2019; Zeidner & Shani-Zinovich, 2011, see Table 2).

The five-factor model's development is based on Allport and Odbert's (1936) lexicographic research which comprised of an analysis of adjectives used to describe individuals. It was further developed and extended by Cattell (1943), Norman (1963), Norman & Goldberg (1966) and Goldberg (1990) (as cited in Ostendorf & Angleitner, 2004). To identify fundamental factors of personality, dictionary adjectives were investigated based on character traits (Pervin et al., 2005). Self- and external descriptions were explored by correlating similarities from a large sample to narrow the list down to stable factors (Goldberg, 1981). The most influential results for the model come from Tupes and Christal (1961, 1992) who determined the model's five factors for the first time

and was finally described by Goldberg (1981) as the "Big- Five" (Ostendorf & Angleitner, 2004). The model's five-part structure was supported by a factor analysis of terms describing an individual's personality for all language taxonomies (ibid.) (see Table 1).

Table 1. Description of the Big Five Personality Traits, Including Associated Adjectives

Neuroticism	• Emotional stability and liability are juxtaposed (Ostendorf & Angleitner, 2004). • High scores: nervous, emotional, insecure • Low scores: relaxed, non-emotional, complacent • Identifies individuals "prone to psychological suffering, unrealistic ideas, excessive addictions/desires…poorly adjusted reactions or coping mechanisms" (Pervin et al., 2005)
Extraversion	• Extent to which an individual maintains interpersonal relationships, how active they are in maintaining this and how strong their desire to engage is (Pervin et al., 2005). • High scores: sociable, optimistic, person-oriented, feeling comfortable in groups and prefer exciting situations • Low scores: distanced, unemotional, uncommunicative, reserved, preferring solitude; however, they are not unhappy, unfriendly, or pessimistic (Ostendorf & Angleitner, 2004)
Openness	• High scores: curious, imaginative, creative, interested in new experiences, tolerant of diversity, likely to engage in new ideas and display unconventional thinking (Pervin et al., 2005) • Low scores: realistic, uncreative, conservative, with limited interests (Ostendorf & Angleitner, 2004)
Agreeableness	• Investigates compassion and empathy on an emotional and action level and defines the "quality of interpersonal orientation on a continuum" (Pervin et al., 2005) • High scores: cooperative, social, likely to give in conflicts, submissive. Abnormal values may be referred to as a dependent personality disorder • Low scores: egocentric, uncooperative, mistrustful, narcissistic, manipulative, has been connected to antisocial and paranoid personality disorders (Costa & McCrae, 2008) • Assumed that higher scores are socially preferred, however, "the willingness to fight for one's own interest sometimes is an advantage" (Ostendorf & Angleitner, 2004)
Conscientiousness	• Ability to correctly carry out tasks, organize and maintain control • Often used in psychodynamic personality theories, focusing on impulse control (Ostendorf & Angleitner, 2004) • High scores: persistent, diligent, self-disciplined, often leads to success in school and work life, however individuals might be workaholics (ibid.) • Low scores: lazy, careless, thoughtless, do not tend to achieve work-related success (Digman & Taketomo-Chock, 1981), aware of prevailing conventions but do not stick to them strongly

Although there are different points of view concerning the connection between personality traits and general self-concept in gifted students (Jopling, 1997; Leary & Tangney, 2003; McCrae & Costa, 1988; McCrae & Costa, 2008; McCrae et al., 2000; Mischel & Morf, 2003, all cited in Dörner, 2006), studies have verified the influence of individual factors on academic self-concept (Caprara et al., 2010; Di Giunta et al., 2013; Jonkmann et al., 2012). The hierarchical model of self-concept, developed by Shavelson et al. (1976) and further developed over the years by Marsh and colleagues since 1985, describe the self-concept as person's self-perceptions, which emerge through life experiences and the individual interpretation of the environment. Furthermore, in context of school he stated that the academic self-concept is always related to specific subjects, which are accompanied by the subordinate factors of verbal and math academic self-concept (Marsh, 1990). Discovering differences in personality and self-concept can be used to diagnose and help students succeed, as one's "academic self-concept" is understood as the totality of cognitive representations of one's own abilities in academic achievement situations (combined from the subscales of critical [school requirements], individual [personal development], social [self-evaluation towards classmates] and absolute [assesses one's own abilities in relation to the overall school context], Schöne et al., 2012). Students' respective self-concepts exert a considerable influence on school-related performance (Marsh & Seaton, 2013; Rost et al., 2007; Schöne et al., 2012). In most

cases, it is assumed that gifted students do display a higher academic self-concept due to an improved performance at school (Freund-Braier, 2009; McCoach & Siegle, 2003; Rost & Hanses, 2000; Van der Meulen et al., 2014). Therefore, many studies examine the effects of different promotion programs, including heterogenous and homogenous learning groups, part-time and full-time, daily and weekly variations, on the academic self-concept of gifted students (e.g., Craven et al. 2000; Cunningham & Rinn, 2007; Preckel et al., 2019). On the other hand, there are studies which support the *uniqueness* of gifted students' academic self-concept (Chang & Lin, 2017). Plucker & Stocking (2001) found that the students' academic self-concept can be high in one subject, like math, due to their high academic performance, but lowered in another subject, like English. So, the assumption that the academic self-concept of gifted students is generally higher than that of average-ability students, because of their high academic achievement, has not been conclusively clarified. However, the theory that students' academic self-concept is subject specific is supported (Marsh, 1990; Plucker & Stocking, 2001). This review was conducted to investigate the current state of research about gifted students' personality and academic self-concept. On the one hand, this information can be used later to train prospective and practicing teachers in the field of gifted education. On the other hand, it could provide a basis to develop educational concepts tailored to the individual needs of students. Both will ultimately improve the promotion of giftedness in and outside schools.

Method

Search Method

This systematic literature review is used to identify research gaps within existing quantitative research (Sturma et al., 2016). The process of publication retrieval included the assessment of 10 databases and analog publications using the online portals Web of Science and FIS (Fachportal Pädagogik, see Figure 1). The search process was based on word combination types and keywords (Begabung* AND Persoenlichkeit*; Begabung* AND Selbstkonzept*; Begabung* AND Persoenlichkeit* AND Selbstkonzept*; gifted* OR talented* AND personal*; gifted* OR talented* AND self-concept*; gifted* OR talented* AND personal* AND self-concept*). Furthermore, following criteria were used for the selection of publications: articles should be published between 2000-2020 (16.1.2020) to ensure that the results are up to date, and only German and English articles were included.

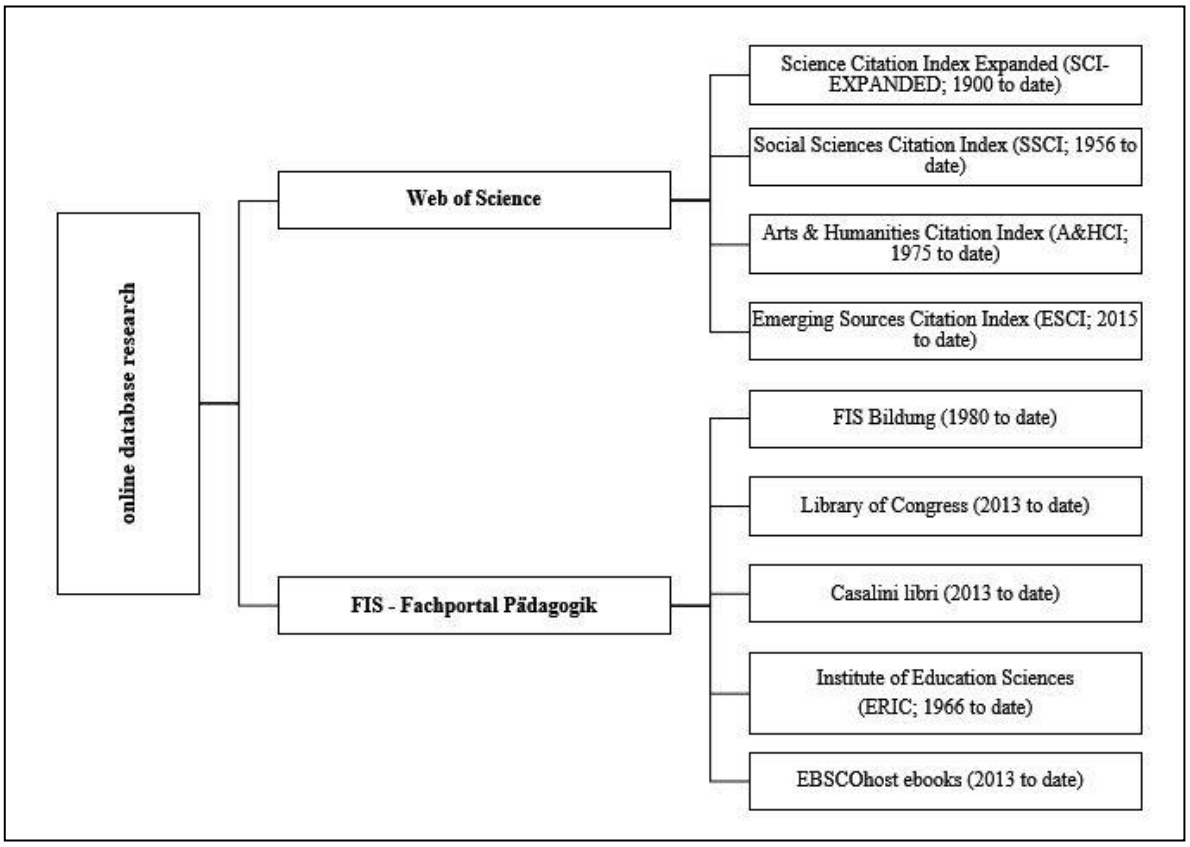

Figure 1. Overview of the Used Databases

Inclusion and Exclusion Criteria

Using the reference management software, entering different keyword combinations in both online portals led to a total of 4,682 hits, with double entries accounted for and corrected. Articles with titles and abstracts that did not match with the review topic were excluded. If suitability was uncertain based on the abstract, it was initially included. Finally, 92 full article texts were read and either taken into account for review or discarded based on the following selection criteria: (1) a personality study related to the Big Five personality traits or gifted students' academic self-concept; (2) describes a quantitative study; (3) participants age range between 6 to 18 years and; (4) a full text is available (see Figure 2).

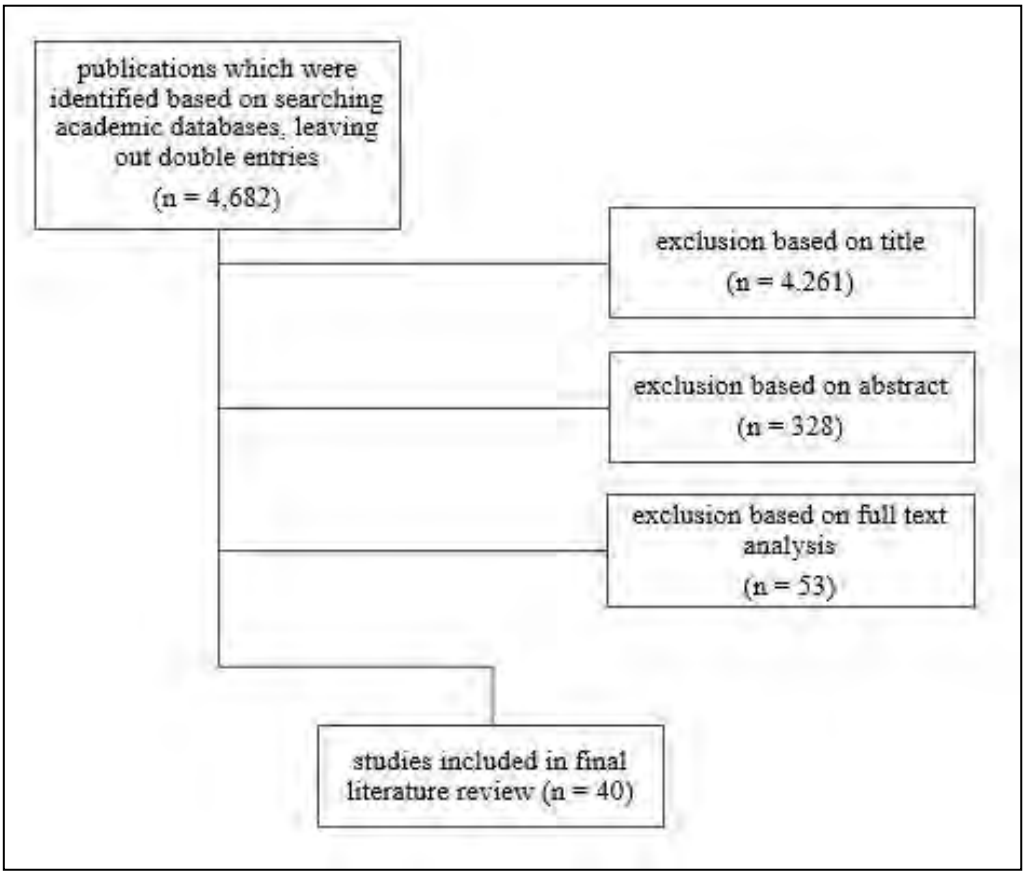

Figure 2. Displaying the Review Process

Final Selection

The final study selection comprised studies mainly from the USA (14) and Germany (11), along with China (2), Australia (2), Switzerland (2), the Netherlands (2), Lebanon (1), Slovenia (1), Jordan (1), Israel (1), Poland (1), and Iran (1). Participants' giftedness was primarily identified by participation in enrichment projects or particular schools for gifted students (22 studies). Selection criteria for those measures were often based on standardized intelligence and performance tests (13 studies), whereas other criteria included grades, teacher nomination or an accelerated school career (5 studies). Even though participant ages ranged from 6 to 18 years, most samples displayed an average age above 12 years. The majority of studies focused on comparing gifted and non-gifted students (22). Additionally, developments in self-concept structures were investigated (13). Some studies focused on comparing different types of giftedness promotion and projects (5 studies).

Results

Differences in Personality between Gifted and Non-gifted Students

Nearly all studies concluded that gifted students score significantly lower on neuroticism scales, which was commonly measured using subscales such as text anxiety, insecurities caused by performance requirements, and

cognitive vulnerability (Dimitrijević, 2012; Freund-Braier, 2000; Hampson, 2006; Kalashi, 2018; Limont et al., 2014; Zeidner & Shani-Zinovich, 2011; see Table 2). Hampson (2006) found that gifted students in promotion programs display more fear than gifted students in regular classes. Furthermore, most studies found that gifted students scored significantly higher for the factor openness, except for one (Dimitrijević, 2012; Limont et al., 2014; Wirthwein et al., 2019; Zeidner & Shani-Zinovich, 2011; but see McCrae et al., 2002). Although Freund-Braier (2000) found that gifted students score significantly lower for the factor extraversion, the remaining studies did not find significant differences.

Additionally, no differences in agreeableness were discovered; however, Hampson (2006) observed higher values in aggression for gifted students, which can be related to the factor agreeableness (Digman, 1990; Goldberg, 1981). It has been shown that gifted students scored higher on the scale independence, which can be assigned to the personality trait conscientiousness (Richards et al., 2003). On the other hand, Gaertner (2004) described significantly higher scores for task management in non-gifted students, but no differences in parental ratings have been observed (Buch et al., 2006). For the trait conscientiousness, gifted students' school performance is significantly correlated (Mammadov et al., 2018).

Apart from Big Five model's personality factors and related scales, Cross et al. (2006; 2007; 2008) identified personality types in gifted students, concluding that the distribution of personality types did not significantly differ from non-gifted students (see Table 3). They found that gifted students were evenly distributed along the extraversion-introversion dimension, tended to orient themselves towards thinking than feeling, and preferred intuition over senses, as well as perception over judgment. In Cross et al. (2007) gifted students preferred the personality type ENFP (14.6%), meaning they perceive themselves more extraverted, they like to deal with abstractions, are able to understand others' feelings, and are more open minded.

In summary, differences between gifted and non-gifted students occur mainly in neuroticism, where gifted students score significantly lower, and in openness, where gifted students score significantly higher than non-gifted students, which is matched by their most assessed personality types.

Differences in Self-Concept between Gifted and Non-gifted Students

It is a widespread conclusion that gifted students display a higher academic self-concept than non-gifted students (Al-Srour et al., 2016; Hoogeveen et al., 2009; McCoach & Siegle, 2003; Rost & Hanses, 2000; Sarouphim, 2011; Wirthwein et al., 2019; but see Callahan, 2004; see Table 4) and that the academic self-concept is positively correlated with global self-concept (Frances et al., 2000; Plucker & Stocking, 2001). Furthermore, other studies found a slight sex bias towards the trend that girls had slightly higher self-concept scores than boys (Lewis & Knight, 2000; Rudasill et al., 2009).

Except for one study, most studies discovered that promotion programs do not have a positive influence on academic self-concept (Van der Meulen et al., 2014; Cunningham & Rinn, 2007; but see Herrmann et al., 2016; see Table 5). However, two studies found positive effects as a result of being admitted to a promotion program, although this change was attributed to the Big Fish Little Pond Effect (BFLPE) due to a homogenous group of students (Marsh, 2005; Preckel & Brüll, 2009). Other studies, which investigated students placed in either homogeneous or heterogeneous promotion programs, found that contrary to popular belief, homogeneous promotion programs do not effect academic self-concept, where heterogeneous programs show significant effects (Craven et al., 2000; Preckel et al, 2019; but see Yeung et al., 2005). It is also interesting to note that being nominated as gifted significantly increased student's academic self-concept regardless of their measured intelligence (Rohrmann, 2009; Schulthess-Singeisen et al., 2008).

Some studies also investigated academic and social self-concept, but with mixed results. Although higher scores have been seen in gifted students for the subscale peer relations, it appears that there are no differences between with varying degrees of giftedness or sex differences (Bain & Bell, 2004; Košir et al., 2015; Rinn, 2006; see Table 6). Furthermore, in comparison to heterogeneous regular classes, social acceptance within homogenous promotion classes significantly increased and then remained constant (Vogl & Preckel, 2014). Additionally, the authors concluded that social assertiveness increased over the course of the study, regardless of class type, and found a significant positive correlation between cognitive abilities and social assertiveness. In summary, most studies say gifted students score significantly higher in academic self-concept than non-gifted students. Promotion programs hardly show any positive effects on academic self-concept.

Table 2. Studies Comparing Gifted (GS) and Non-gifted (NGS) Student Personalities

Study: author, year	Study Design	Results (selection)
Freund-Braier (2000)	**N** = 214; **age** = 6 to 9 years **DV**: selected personality traits of GS and NGS **IV**: diagnosed or non-diagnosed giftedness **method**: questionnaire **country**: Germany	-GS scored higher in self-descriptions for *school ambition* and tended to have a higher need for *personal assertiveness*, as well as less general and situation specific fear. -NGS tended to negatively present themselves as inferior, had higher test anxiety, accepted authorities more often, and had the lowest scores for *introversion* in self-descriptions. -Compared to boys, girls described themselves as more anxious and did not strive as much for social recognition.
McCrae et al. (2002)	**N** = 870; **age** = 10 to 13 years **DV**: personality factors of GS in various age groups **IV**: > 97% on a standardized test for academic performance issued by John Hopkins University **method**: questionnaire **country**: USA	-Personality traits in GS remain consistent throughout various age groups, and developments can be seen in progression curves. -*Neuroticism*: slight increase in girls with increasing age. -*Openness*: increase in both sexes over the years. -*Extraversion, agreeableness,* and *conscientiousness* remained stable.
Richards et al. (2003)	**N** = 58; **age** = 11 to 15 years **DV**: behavior and emotional factors in GS and NGS **IV**: IQ > 127 (gifted) or between 97 and 102 (non-gifted) **method**: questionnaire **country**: Australia	-GS tended to judge themselves as more emotionally adjusted, although mean values of the recorded index of *emotional symptoms* did not significantly differ. -*Depression, feelings of inadequacy,* and *attitudes towards the teacher* were significantly lower, but *independent* scores were significantly higher for GS.
Gaertner (2004)	**N** = 57; **age** = 6 to 11 years (1st – 6th grade) **DV**: selected personality traits of GS **IV**: IQ >130 (gifted) or <115 (non-gifted) **method**: questionnaire **country**: Germany	-NGS were significantly more *engaged in tasks*. -*Social competence* did not correlate with IQ. -No significant differences in *social competence*.
Buch et al. (2006)	**N** = 287; **age** = 8 years (3rd grade) **DV:** parental assessment of their child's personality **IV:** IQ > 135 (gifted) or IQ > 102 (non-gifted) **method**: questionnaire (parents) **country**: Germany	-No differences in parental assessments for GS and NGS. -No specific characteristics in the development of GS and NGS.
Hampson (2006)	**N** = 303 (66 gifted children in part and full-time promotion programs [GSP], 118 gifted children in regular classes [GSR], 119 non-gifted students [NGS]); **age** = 9 to 11 years (4th to 6th grade) **DV:** GS personality traits in comparison to GS specifically in promotion programs **IV:** participating in promotion programs and intelligence test score	-GSP and GSR had average scores for *neuroticism, reaction to failure*, and *extraversion*, however there were no significant scorings between the groups. -Compared to GSR, GSP felt more insecure concerning performance requirements, had more fear of the demands and related somatic symptoms, and described themselves as aggressive and dominant. -Compared to NGS, GSP scored higher *aggression* values and rate themselves more *cognitively efficient*, less *physically effective*, less *appreciated*, and less *positive/happy*. -Compared to NGS, GSR scored lower in *insecurities through performance requirements, neuroticism*, as well

	method: questionnaire, intelligence test **country**: Switzerland	as *reaction to failure*, and rate *cognitive performance* and *confident behavior* higher, with lower *anxiety*. -GSP in full-time programs were more *aggressive* than GSP in part-time programs. -Gender differences in GSP: Girls were more *aggressive* than boys. -No significant sex differences for personality traits GSR and NGS. -GSP rate *physical efficiency, positive mindset*, and *lack of fear* lower than GSR.
Zeidner & Shani-Zinovich (2011)	**N** = 802; **age** = 14 to 16 years **DV:** GS and NGS personality factors **IV:** taking part in a promotion program (special program / pull-out-program) **method**: questionnaire **country**: Israel	-GS scored higher on *openness toward new experiences* and had lower scores for *neuroticism* and *state anxiety*. -No significant differences for psychological stress and social well-being as well as for socio-emotional and personality aspects.
Dimitrijević (2012)	**N** = 515; **age** = 17 to 19 years **DV:** GS and NGS personality traits **IV:** selection procedure based on school report **method**: questionnaire **country**: Serbia	-GS scored significantly higher for *openness for new experiences* and significantly *lower* for neuroticism. -GS displayed higher values for *laziness, fantasy, feelings, ideas, and values* but lower values for *depression, vulnerability, sociability, altruism, sensitivity, and orderliness.*
Limont et al. (2014)	**N** = 235; **age** = 14 to 18 years **DV:** GS and NGS personality factors **IV:** admission to a special school for winners of national school competitions **method**: questionnaire **country**: Poland	-GS had significantly higher values for *openness to new experiences* and significantly lower values for *neuroticism*.
Benölken (2015)	**N** = 140; age = 8 to 10 years (3^{rd} – 4^{th} grade) **DV:** GS and NGS selected personality traits **IV:** taking part in a talent promotion program **method**: questionnaire **country**: Germany	-No significant differences in scores for *competitiveness* when solving school-related tasks. -For *social style*, GS girls preferred working significantly more on school-related tasks together. Compared to NGS girls, GS girls ask significantly more for help.
Kalashi et al. (2018)	**N** = 120; **age** = 14 to 18 years **DV:** Female GS personality traits **IV:** admission to a school for gifted students **method**: questionnaire **country**: Iran	-GS scored significantly lower for *physical/cognitive vulnerability* and *interpersonal conflict*s when compared to standard values.
Mammadov et al. (2018)	**N** =161; **age** = 11 to 18 years **DV:** GS personality traits **IV:** taking part in the project *Northwestern University's Midwest Academic Talent Search (NUMATS)* and/or *Northwestern University Center of Talent Development (CTD)* **method**: questionnaire **country**: USA	-*Conscientiousness and agreeableness* (individual attribute levels) have a significant positive effect on, and *openness* positively influences, school-related performance. -*Controlled and autonomous motivation* were identified as strong mediators.

Wirthwein et al. (2019)	**N** = 760; **mean age** = 16.66 years **DV:** GS and NGS personality traits **IV:** standardized intelligence score (SIS) > 120 **method**: questionnaire **country**: Germany	-GS scored higher values for *openness*, have better grades, display higher levels of *motivation*, and rate themselves as more *intelligent*. -No anomalies regarding GS *personality, motivation*, and *school-related success*.

Note: Study design included N (sample size), age, DV (dependent variable), IV (independent variable), method, and the country the study was conducted in, along with a selection of results (measured constructs are distinguished by italics).

Table 3. Studies Comparing Gifted (GS) and Non-gifted Students' (NGS) Personality Types

Study: author, year	Study Design	Results (selection)
Cross et al. (2006)	**N** = 152; **mean age** = 16.09 years **DV:** GS personality types **IV:** SAT-score, grades, high school performance review, being nominated by teachers, application, external reviewer **method**: questionnaire **country**: USA	-GS personality types were evenly distributed across an extraversion-introversion continuum., but oriented towards thinking than feeling as well as perceiving than judging. -Most GS (41.5 %) displayed the type "intuition/perception".
Cross et al. (2007)	**N** = 931; **mean age** = 16 years **DV:** GS personality types **IV:** SAT-score, grades, high school performance review, being nominated by teachers, application, external reviewer **method**: Myers-Briggs Type Indicator **country**: USA	-GS tended to use more intuition than sensing. -Most common personality types were *ENFP* (14,6%), *ENTP* (11,1%), and INTP (10,1%) in GS.
Cross et al. (2008)	**N** = 567; **age** = 15 to 16 years **DV:** GS personality types **IV:** SAT-score, grades, high school performance review, being nominated by teachers, application, external reviewer **method**: questionnaire **country**: USA	-When compared to a standard sample, GS displayed no significant differences regarding personality types, *neuroticism,* or personality problems. -Authors discuss that GS do not display any psychological or personal abnormalities due to increased cognitive capabilities.

Note: Study design included N (sample size), age, DV (dependent variable), IV (independent variable), method, and the country the study was conducted in, along with a selection of results.

Table 4. Studies Comparing Gifted (GS) and Non-gifted Student's (NGS) Academic Self-Concept

Study: author, year	Study Design	Results (selection)
Rost & Hanses (2000)	**N** = 214; **age** =14 to 17 years **DV:** GS and NGS self-concept **IV:** identified as gifted based on own testing **method**: questionnaire **country**: Germany	-GS scored higher on *academic self-concept* and rated themselves as less popular. -No gender differences for *self-concept* were found.
Lewis & Knight (2000)	**N** = 368; **age** = 8 to 16 years (4^{th} to 12^{th} grade) **DV:** GS global self-concept in certain grades **IV:** admission to a particular gifted group **method**: questionnaire	-No significant gender differences for *global self-concept*. -GS girls rate themselves significantly higher for the *behavioral, intellectual, and school states*, whereas boys rated themselves significantly higher for the *fear state*. -Middle school students rated *global self-concept* and

	country: USA	*behavior* significantly lower than elementary or high school students. -Authors emphasize that obtaining *global self-concept* data can conceal values for other subscales by using mean values.
McCoach & Siegle (2003)	**N** = 370; **age** = 12 to 16 years **DV:** GS and NGS academic self-assessment **IV:** > 92% score on a standardized test for eligibility and performance **method**: questionnaire **country**: USA	-GS had higher scores for *self-assessment* and higher average grades. -Moderate correlations in GS and positive correlations in NGS between *academic self-assessment* and *stated grade average* were found. -Comparable relationship between *stated grade average* and *academic self-concept* in GS and NGS.
Callahan et al. (2004)	**N** = 457; **age** = 10 to 16 years **DV:** GS self-concept (either they skipped a grade or not) **IV:** taking part in a three-week giftedness promotion program at the University of Virginia **method**: questionnaire **country**: USA	-No significant differences between GS who skipped a grade and those that did not for *self-concept* and the subscales *mathematical self-concept, verbal self-concept, physical skills, academic self-concept, relations to the opposite sex, general self-concept, honesty and trustworthiness, relations to parents, emotional stability, looks, relations to the same sex* -GS that did not skip a grade scored significantly higher for *mathematical self-concept, general self-concept*, and *verbal self-concept*, however, effect sizes were moderate.
Hoogeveen et al. (2009)	**N** = 357; **age** = 9 to 13 years **DV:** GS and NGS self-concept (general, self, and physical) **IV:** accelerated (skipping a grade) or non-accelerated school year **method**: questionnaire **country**: Netherlands	-No significant differences for *general self-concept*. -*Academic self-concept* had the following subscales: *school-related, mathematical, and verbal self-concept*. -GS had higher values for *school-related* and *mathematical self-concept* and no significant differences for *verbal and physical self-concept*. -*Social self-concept* was divided into same sex and different sex relations. GS had a significantly less positive *self-concept for same sex relations*, and no difference for *different sex relations*.
Rudasill et al. (2009)	**N** = 560; **age** = 9 to 15 years **DV:** GS self-concept across various grades **IV:** participating in a two-week promotion program for GS **method**: questionnaire **country**: USA	-*Self-concept* was divided into six individual subscales in the study. -GS boys scored significantly higher than girls for *sports-related competence, physical appearance, and global self-worth*. -GS girls scored significantly higher for *behavior*. -No sex differences for *academic competence* and *social acceptance*. -Older students (8^{th} to 11^{th} grade) scored significantly higher for *social acceptance and behavior*, and significantly lower for *sport-related competence, physical appearance, and global self-worth*.
Sarouphim (2011)	**N** = 242; **age** = 12 to 14 years **DV**: GS and NGS self-concept, self-esteem, and depression **IV:** scoring "*definitely"* in at least two intelligence dimensions on the DISCOVER-test **method**: questionnaire **country**: Lebanon	-*Global self-concept* was divided into six subscales: *behavior adaptation, intellectual and school status, looks and characteristics, being free from anxiety, popularity, luck, and happiness*. -*Global self-concept* mean value of all participants was close to average (52.75). -GS scored significantly higher for *self-concept, intellectual and school status*.
Košir et al. (2015)	**N** = 404; **age** = 11 to 15 years **DV:** GS and NGS social acceptance and self-concept **IV:** being classified as gifted	-For *social acceptance*, no significant differences for the subscales *positive sociometric nomination* and *social preferences*. -GS scored less for *negative nominations* and have less

	or non-gifted according to *Concept of Identification and Work with Gifted Students in a nine-year Elementary School* (1999) **method**: questionnaire **country**: Slovenia	*social influence* but were regarded as more *socially accepted by their teachers*. -GS scored higher on *academic* and *general self-concept*, yet not for *social self-concept*. -No significant differences in students labelled as gifted students by an intelligence test or as identified by their teachers.
Al-Srour & Al-Oweidi (2016)	**N** = 301; **age** = 10 to 12 years **DV:** GS and NGS self-concept **IV:** admission to a school for talented children **method**: questionnaire **country**: Jordan	-GS scored significantly higher for *self-concept* (*mathematics, academic self-concept, self-appreciation, loyalty, relationships to friends, problem solving, appearance, physical skills*). -No significant sex differences.
Ritchotte et al. (2016)	**N** = 203; **age** = 8 to 12 years **DV:** GS and NGS psychosocial factors **IV:** scoring or non-scoring > 97% on "CogAT" (>90% of "CogAt" and > 95% in "Reading Total", "Math Total" or "Total Battery" of the "Iowa Tests of Basic Skills"). **Method**: questionnaire **country**: USA	-Examined *academic self-perception, attitudes towards school, attitudes towards teachers, target valuation*, and *motivation/self-regulation*. -GS scored significantly higher for *academic self-perception*, with no other differences for all other factors.
Wirthwein et al. (2019)	**N** = 760; **mean age** = 16.66 years **DV:** GS and NGS academic self-concept in mathematics and German **IV:** standardized intelligence score (SIS) > 120 **method**: questionnaire **country**: Germany	- GS scored significantly higher in *mathematical ability self-concept, interest in mathematics, valuing of mathematics, hope for success,* and *general achievement motivation*, and significantly lower in *fear of failure*

Note: Study design included N (sample size), age, DV (dependent variable), IV (independent variable), method, and the country the study was conducted in, along with a selection of results (measured constructs are distinguished by italics).

Table 5. Studies Investigating Effects of Promotion Programs on Gifted Students' (GS) Academic Self-concept

Study: author, year	Study Design	Results (selection)
Craven et al. (2000)	**N** = 634; **age** = 8 to 12 years **DV:** GS self-concept in promotion programs **IV:** homogeneous or heterogeneous performance group **method**: questionnaire **country**: Australia	-No differences in *non-academic self-concept, academic self-concept, school related motivation* and *school-related performance* for GS in either performance group. -In comparison to students not in selective programs, scores of students in selective programs were significantly lower in all dimensions for *academic self-concept*, all dimensions except one for *non-academic self-concept*, and four out of six dimensions for *school-related motivation*.
Frances et al. (2000)	**N** = 495; **age** = 12 to 14 years **DV**: GS structure of self-concept **IV**: admission to a promotion class **method**: questionnaire **country**: China	-*Verbal* and *mathematical self-concept* positively correlate with *academic* and *general self-concept*. -*Verbal* and *mathematical self-concept* negatively correlate. -Study supports assumptions about the multidimensionality and specific nature of GS self-concepts.
Yeung et al. (2005)	**N** = 757; **age** = 10 to 11 years **DV:** development of GS and NGS self-concept in different	-After starting a promotion program, in class 1 and 2, both GS groups had a higher *self-concept* than NGS2. -Positive influences on *self-concept* in GS2 and NGS1

	settings **IV:** four ability groups (GS1, GS2, NGS1, NGS2), separated into three classes (class 1: GS1; class 2: GS2+NGS1; class 3: NGS2) **method**: questionnaire **country**: China	in the heterogeneous setting (class 2), although GS2 scored higher than NGS1 after one year. -Speculation regarding the effectiveness of promotion programs with homogeneous groups of GS.
Rinn (2006)	**N** = 140; **age** = 11 to 15 years **DV:** development of GS social self-concept in promotion programs **IV:** taking part in a three-week promotion program for GS **method**: questionnaire **country**: USA	-Pre-post-test self-evaluations for *same sex relations* and *opposite sex relations* of the SDQ-II. -No significant sex differences for the pre-test, however there were significant differences for *same sex relations* and *opposite sex relations* for both sexes for the post-test. -No significant differences between *school-related performance* and *social self-concept*.
Cunningham & Rinn (2007)	**N** = 140; **age** = 11 to 15 years **DV**: development of GS academic, general, emotionally stable self-concept in promotion programs **IV**: time 1 (before participation) and 2 (after participation) **method**: questionnaire **country**: USA	-Significant improvement for *general* and *emotionally stable self-concept,* and no change for *academic self-concept* after the promotion program, although effect sizes were low. -Boys scored significantly higher for *emotionally stable self-concept*. -GS who participated for the project for the first time scored significantly higher in *general self-concept* than GS who had already taken part in the program.
Schulthess-Singeisen et al. (2008)	**N** = 314; **age** = 7 to 13 years **DV**: development of GS and NGS *school-related skill self-concept* and *global self-worth* **IV**: admission or non-admission to a promotion program for GS (IC score) *method*: questionnaire and intelligence test *country*: Switzerland	-Sample was subdivided into four groups based on IQ test (1: highly intelligent children admitted to a promotion program for GS [IQ ≥ 130, N=113]; 2: children not admitted to the promotion program, above average and nominated by teacher [130 ≤ IQ ≤ 115, N=72]; 3: children not admitted to the promotion program, average and nominated by teacher [115 ≤ IQ ≤ 85, N=37]; 4: control group of randomly chosen school classes without any relation to promotion programs [N=92]). -GS score significantly higher for *school-related skill self-concept* than NGS. All nominated children showed higher values when compared to the control group. Since values remained consistent for all groups throughout the testing period, it is suggested that *skill self-concepts* relate to teacher nomination than intelligence values/scorings. -Groups 2 and 3 scored significantly higher for *global self-concept* than group 4. -Rejection by promotion programs does not have an influence on *self-worth*. -No differences between groups 1 and 4 for global self-worth, suggesting that GS do not form an individual group for the dimension *out-of-school self-concept*.
Preckel & Brüll (2009)	**N** = 722; **age** = 8 to 12 years **DV**: GS academic self-concept in full-time promotion classes and regular classes **IV**: admission or non-admission to a full-time promotion class **method**: questionnaire	-Admission to a promotion class had a positive effect on GS *academic self-concept*. -However, negative effects for *academic self-concept* occur simultaneously as average performance levels of the whole group increase, causing BFLPEs to even out.

	country: Germany	
Rohrmann (2009)	**N** = 57; **age** = 5 to 10 years **DV**: promoted and non-promoted GS and NGS self-concept **IV**: admission to a promotion program for GS **method**: questionnaire **country**: Germany	-20 regular students and 37 project students (2/3 regarded as exceptionally talented) were investigated in the areas *intelligence*, *social-emotional experience*, and *self-concepts* over the course of four years. -Large distribution of project NGS *self-concept* scorings. -NGS had significantly lower *academic self-concept* than project NGS in 2nd and 4th grade, this correlated with intelligence scorings. -Self-assessment for intelligence was higher than the actual values, suggesting that family background, project nomination, and intelligence differences are responsible for *self-concepts* differences. -Some exceptionally project GS assessed themselves below average, which could be due to critical self-reflection.
Van der Meulen et al. (2014)	**N** = 93; **age** = 8 to 11 years **DV**: GS self-concept in promotion programs **IV**: time 1 (before participation) and 2 (after 2.5 months) **method**: questionnaire **country**: Netherlands	-Measured *global self-worth* and five *self-concept* constructs (*school-related competence, social recognition, sport related competence, physical appearance, and behavior*). -Within the total population, the lowest 15% of scores were regarded as clinical. Compared to general Dutch mean scorings, results showed that none of the GS had clinical school-related competence values. However, 14.0% of the sample scored clinical values for *social recognition*, 20.9% for *sport-related competence*, 12.8% for *physical appearance*, 5.8% for *behavior*, and 7.0% for *global self-worth*. -Results obtained from the second time of testing revealed slightly positive effects of the promotion program for *school-related competence* and *behavior*.
Hermann et al. (2016)	**N** = 1,330; **age** = 9 to 11 years **DV**: GS verbal and mathematical self-concept in regular and gifted classes **IV**: admission or non-admission to a giftedness promotion class **method**: questionnaire **country**: Germany	-Positive adjustment effects on *mathematical self-concept* after admission to the promotion class were evened out as a result of high average performance levels in the promotion class. -No effects in *verbal self-concept* after being admitted to the promotion class.
Preckel et al. (2019)	**N** = 922; **age** = 8 to 12 years **DV**: GS academic self-concept in promotion classes and regular classes **IV**: admission or non-admission to a gifted class **method**: questionnaire **country**: Germany	-No significant on *academic self-concept* for all comparison groups (notably, for students in regular and promotion classes). -*Academic self-concept* and *school-related performance* were mutually dependent on each other.

Note: Study design included N (sample size), age, DV (dependent variable), IV (independent variable), method, and the country the study was conducted in, along with a selection of results (measured constructs are distinguished by italics).

Table 6. Studies Investigating Gifted Students' (GS) Academic Self-concept

Study: author, year	Study Design	Results (selection)
Plucker & Stocking (2001)	**N** = 131; **age** = 12 to 16 years **DV:** GS academic self-concept **IV:** three performance groups: students scoring >540 on SAT	-The Internal / External Model (Marsh, 1986) can be applied to research GS *verbal* and *mathematical self-concept*. -Good performance in one subject has a positive effect

	math test and > 499 SAT verbal test; students scoring >500 on SAT math test and <500 on SAT verbal test; students scoring <580 in SAT math test and >499 SAT verbal test **method**: questionnaire **country**: USA	on their *self-concept* in that subject and a negative effect on their *self-concept* in other subjects.
Bain & Bell (2004)	**N** = 93; **age** = 9 to 13 years **DV:** GS social self-concept, attribution of social success and failure and peer relations **IV:** scoring > 96% (gifted) or > 85% (high performance) on a standardized test for academic performance **method**: questionnaire **country**: USA	-Compared to high performance students, GS scored significantly higher for *physical skills, appearance, peer-relations,* and *general self-concept* as well as SSAS subscales *success skills, success efforts, success chances, mistake skills, mistakes, and failing at complex tasks*. -No significant differences for the SSAS subscales *chance to fail* and *success in complex tasks*. -A multivariate analysis revealed significant effects for placement for subscale types.

Note: Study design included N (sample size), age, DV (dependent variable), IV (independent variable), method, and the country the study was conducted in, along with a selection of results (measured constructs are distinguished by italics).

Discussion

Given that the promotion of gifted students gets part of the professional competencies of teachers, the research about their personality gets more and more important. This systematic literature review aimed to display the current state of quantitative research about personality and academic self-concept in gifted students. Although, there are many studies included, which deliver interesting results about the personality and self-concept of gifted students, this area is partially under-researched about domain or subject specific giftedness. Almost all studies place their concept of giftedness on a very general approach, mainly based on measured intelligence. Furthermore, there are only very few studies which are based on the Big-Five model and deliver comparable data. In summary the personality of gifted students does not differ much from that of average-ability students, but according to the academic self-concept there are major differences between them, which may lead to useful implications for gifted education. The information from these studies can be used to train prospective and practicing teachers, tailored to their individual subject, to improve the gifted education in and outside schools.

When exploring personality traits, modern studies often agree with the *harmony theory* (Terman, 1925), which says that there are no negative social-emotional differences in gifted students compared to nongifted, and even find socially positive traits in gifted students. The results of the review show few significant differences regarding personality scales and factors were obtained between gifted and nongifted cohorts, except for neuroticism and openness. If we take into account that gifted students seem to score lower on neuroticism than average-ability students, supported by various studies (see chapter 3.1), for gifted promotion, we could indicate that they may especially benefit from a more free way of working. They could work problem- and action-orientated on different tasks without being afraid of failure. This general implication may be useful for gifted promotion in any subject, but seems especially suitable for the sciences, because it matches with the scientific method (Wegner, 2014). Maybe teachers should keep this in mind and try to take a more moderating than leading role in class. Furthermore, the included studies of the review report that gifted students show higher openness to experience than non-gifted students. In practice, the wider range of interests of gifted students should be used by teachers to intrinsically motivate them to learn and benefit from possible additional promotion in any subject. Because of their potentially increased eager for knowledge, a confrontation with various topics and interesting new facts could well address gifted students, so they further substantiate their subject specific knowledge.

It is commonly accepted that gifted students have a higher academic self-concept than non-gifted students (Freund-Braier, 2009), which is confirmed by the present review. There are many studies which support the assumption that high academic performance positively influences students' academic self-concept, and vice versa (e.g. Marsh & Craven, 1997), which may also have a positive effect on their later professional performance. In addition, increased academic performance can lead to a higher academic self-concept, which in turn can result in more motivation to learn (Freund-Braier, 2009; Buff et al., 2005). At first glance, this

assumption is a good starting point for the promotion of gifted students, because a high but balanced self-concept can help the students in their later professional career. However, it must be noted that the academic self-concepts should not be too high. There are studies which found that individuals with unrealistic self-concepts showed unpleasant behavior towards social interaction partners, like tending to interrupt them in a conversation (Colvin et al., 1995), which could be assessed negatively by future employers. Furthermore, it is important to observe a possible BFLPE (Marsh, 1986) to prevent negative impacts on students' self-concepts, which eventually lead to limited academic performance or motivation (Preckel & Brüll, 2009).

These results should be interpreted with caution. Firstly, it must be noted that the term giftedness is not properly defined, as there are various parameters used to determine the degree of giftedness, standardized intelligence tests, admission to promotion programs, school grades, and nominations by teachers. When making comparisons with homogeneous gifted classes, regular classes were regarded as non-gifted without any differentiation between levels of giftedness. Secondly, participant age groups were biased towards either being in the range of < 10 years or > 16 years, leaving out analyses of children between those age ranges. Thirdly, only two web portals were used with a bias of studies from the USA and Germany. Finally, grey literature was excluded along with studies that did not have full texts available, those published in languages other than English or German, those that focused on qualitative approaches or were more conceptual, and possible studies that our online search overlooked as a result of special expressions for the terms giftedness, personality, and self-concept.

There are several limitations of this review, which must be considered. Used search criteria prevented the inclusion of studies before 2000, which may have caused that older important findings were not taken into account. Additionally, qualitative studies and grey literature were excluded, so certain findings have might been disregarded here too. It is mentioned that many studies use different conceptions of giftedness, but the present study did not provide an analysis whether the results differ according to different definitions of giftedness used, which would be an interesting future endeavor.

Although the Big-Five Model is a well-researched and stable concept for quantitatively investigating personality, there is a clear lack of studies on personality research in gifted students. According to iPEGE (2009; 2014) giftedness is a multifaceted concept and should be examined in various disciplines such as science, art, and linguistics, to introduce a new field of subject-specific research on giftedness. To generate more specific implications for teacher trainings in gifted education more information about gifted student's personality should be examined in future studies. These should concentrate on different types of giftedness, orientated to the usual subjects in school, for example STEM, because studies in the review refer to a very general concept of giftedness. In contrast to many postulated concepts, giftedness does not only express itself through a high value of intelligence (iPEGE, 2009), so promotion must be worked out individually in each subject area, in order to support gifted students, suited to their individual talents (iPEGE, 2014). The implications for gifted education and related teacher trainings should be controlled in future studies.

Additionally, as there are a variety of instruments and methods to explore personality, studies should aim to use comparable measuring methods. Although some of the studies used methods which can be related and categorized within the Big-Five personality factors, there are some conceivable differences and research gaps, which does not provide us with a standardized protocol. Academic Self-concept is often regarded in the majority of publications as a subscale of global self-concept; in order to draw conclusions about academic self-concept, research should apply methods which enable a more differentiated approach to the construct to increase its validity, such as instruments which relate their questions more to school context, like different school subjects and factors such as educational requirements or individual development. Finally, future studies should investigate samples with large age ranges, particularly between 9 and 12 years old, to look at effects regarding the admission to secondary schools.

In summary, personality research in gifted students is progressing and initial tendentious differences with non-gifted students can be identified, but there is a lack of research in giftedness in specific subjects. To really find valid implications for educational concepts of gifted promotion, further studies must be conducted in different subjects, like arts or sciences. Research in academic self-concept of gifted students seems already extensive and many studies agree on a higher self-concept of gifted students, but there are results which imply uniqueness of gifted students' academic self-concept in every subject. Additionally, research about the academic self-concept of gifted students in specific subjects will enable more specified indications for their promotion since there are clear advantages of a high but balanced academic self-concept for their professional career. Implications for teacher trainings and ideas about subject related gifted education should be verified in future studies.

References

Ackerman, P. L., & Heggestad, E. D. (1997). Intelligence, personality, and interests: Evidence for overlapping traits. *Psychological Bulletin*, *121*(2), 219–245. https://doi.org/10.1037/0033-2909.121.2.219

Allport, G. W., & Odbert, H. S. (1936). Trait-names: A psycho-lexical study. *Psychological monographs*, *47*(1), 1 – 171. https://doi.org/10.1037/h0093360

Al-Srour, N. H., & Al-Oweidi, A. M. (2016). Self-concept among Gifted and Non-gifted Students and its Relationship with Gender Variable in a Jordanian Sample. *International Journal of Educational Sciences*, *12*(1), 50–56. https://doi.org/10.1080/09751122.2016.11890412

Bain, S. K., & Bell, S. M. (2004). Social self-concept, social attributions, and peer relationships in fourth, fifth, and sixth graders who are gifted compared to high achievers. *Gifted Child Quarterly*, *48*(3), 167-178. https://doi.org/10.1177/001698620404800302

Barrantes-Vidal, N. (2004). Creativity & madness revisited from current psychological perspectives. *Journal of Consciousness Studies*, *11*(3-4), 58-78. https://www.museuartbrut.com/files/pdf/neus-barrante/Creativity-and-Madness-J-Consciousness-Studies.pdf

Benölken, R. (2015). *Mathematisch begabte Mädchen. Untersuchungen zu geschlechts- und begabungsspezifischen Besonderheiten im Grundschulalter* [Gifted girls in mathematics. Studies on gender and talent specific characteristics at primary school age.]. WTM, Verl. für Wiss. Texte und Medien.

Buch, S. R., Sparfeldt, J. R., & Rost, D. H. (2006). Eltern beurteilen die Entwicklung ihrer hochbegabten Kinder [Parents evaluate the developement of their highly gifted children]. *Zeitschrift für Entwicklungspsychologie und Pädagogische Psychologie*, *38*(2), 53–61. https://doi.org/10.1026/0049-8637.38.2.53

Buff, A., Nakamura, Y., Hollenweger, J. & Achermann, E. (2005). Selbstwahrnehmung bei Schuleintritt [Self-perception at school entry]. In U. Moser, M. Stamm & J. Hollenweger (ed.), *Für die Schule bereit?* [Ready for school?] (p. 113-128). Aarau: Sauerländer.

Caprara, G. V., Vecchione, M., Alessandri, G., Gerbino, M., & Barbaranelli, C. (2010). The contribution of personality traits and self-efficacy beliefs to academic achievement: A longitudinal study. *British Journal of Educational Psychology*, *81*(1), 78–96. https://doi.org/10.1348/2044-8279.002004

Callahan, C.M., Sowa, C. J., May, K. M., Tomchin, E. M., Plucker, J. A., & Cunningham, C. M. (2018). Social and emotional development of gifted students. In *Gifted Child Today 4*(4), 176. https://doi.org/10.1177/1076217518788591

Cattel, R. B. (1943). The description of personality: Basic traits resolved into clusters. *Journal of Abnormal and Social Psychology, 38,* 476-506. https://doi.org/10.1037/h0054116

Chang, C.-Y., & Lin, P.-L. (2017). The relationship between science achievement and self-concept among gifted students from the third international earth science olympiad. *Eurasia J. Math. Sci. Technol. Educ*, *13*, 3993–4007. https://doi.org/10.12973/eurasia.2017.00768a

Colvin, C. R., Block, J., & Funder, D. C. (1995). Overly positive self-evaluations and personality: Negative implications for mental health. *Journal of personality and social psychology*, *68*(6), 1152-1162. https://doi.org/10.1037/0022-3514.68.6.1152

Costa, P. T., & McCrae, R. R. (2008). The revised NEO personality inventory (NEO-PI-R). In *The SAGE Handbook of Personality Theory and Assessment: Volume 2 - Personality Measurement and Testing* (Issue November). https://doi.org/10.4135/9781849200479.n9

Craven, R. G., Marsh, H. W., & Print, M. (2000). Gifted, streamed and mixed-ability programs for gifted students: Impact on self-concept, motivation, and achievement. *Australian Journal of Education*, *44*(1), 51–75. https://doi.org/10.1177/000494410004400106

Cross, T. L., Cassady, J. C., Dixon, F. A., & Adams, C. M. (2008). The psychology of gifted adolescents as measured by the MMPI-A. *Gifted Child Quarterly*, *52*(4), 326–339. https://doi.org/10.1177/0016986208321810

Cross, T. L., Cassady, J. C., & Miller, K. A. (2006). Suicide ideation and personality characteristics among gifted adolescents. *Gifted Child Quarterly*, *50*(4), 295–306. https://doi.org/10.1177/001698620605000403

Cross, T. L., Neumeister, K. L. S., & Cassady, J. C. (2007). Psychological types of academically gifted adolescents. *GIFTED CHILD QUARTERLY*, *51*(3), 285–294. https://doi.org/10.1177/0016986207302723

Cunningham, L. G., & Rinn, A. N. (2007). The role of gender and previous participation in a summer program on gifted adolescents' self-concepts over time. *Journal for the Education of the Gifted*, *30*(3), 326–352. https://doi.org/10.1177/016235320703000303

DeYoung, C. G. (n.d.). Intelligence and Personality. In R. J. Sternberg & S. B. Kaufman (Eds.), *The Cambridge Handbook of Intelligence* (pp. 711–737). Cambridge University Press. https://doi.org/10.1017/CBO9780511977244.036

Di Giunta, L., Alessandri, G., Gerbino, M., Kanacri, P. L., Zuffiano, A., & Caprara, G. V. (2013). The determinants of scholastic achievement: The contribution of personality traits, self-esteem, and academic self-efficacy. *Learning and individual Differences*, *27*, 102-108. https://doi.org/10.1016/j.lindif.2013.07.006

Digman, J. (1990). Personality structure: Emergence of the 5-Factor model. *Annual Review of Psychology*, *41*(1), 417–440. https://doi.org/10.1146/annurev.psych.41.1.417

Digman, J. M., & Takemoto-Chock, N. K. (1981). Factors in the natural language of personality: Re-analysis, comparison, and interpretation of six major studies. *Multivariate behavioral research, 16*(2), 149-170. https://doi.org/10.1207/s15327906mbr1602_2

Dimitrijevic, A. A. (2012). A faceted eye on intellectual giftedness: Examining the personality of gifted students using FFM domains and facets. *Psihologija*, *45*(3), 231–256. https://doi.org/10.2298/PSI1203231A

Dörner, J. (2006). *A self-concept measure of personality growth: Self-concept maturity (SCM): Development, validation, and age effects*. International University Bremen. https://d-nb.info/1034893785/34

Frances, A., Lai, L., Yeung, A. S., Low, R., & Jin, P. (2000). Academic self-concept of talented students: factor structure and applicability of the internal/external frame of reference model. *Journal for the Education of the Gifted*, *23*(3), 343–367. https://psycnet.apa.org/record/2000-15895-004

Freund-Braier, I. (2009). Persönlichkeitsmerkmale [Personality traits]. In D. H. Rost (Ed.), *Hochbegabte und hochleistende Jugendliche: Neue Ergebnisse aus dem Marburger Hochbegabtenprojekt* [Highly gifted and highly performing adolescents: New results from the project for highly gifted adolescents of Marburg] (2. ed., pp. 161–210). Münster: Waxmann.

Gaertner, J. (2004). *Die Zusammenhänge zwischen Bindungstyp, Explorationsverhalten und ausgewählten Persönlichkeitsaspekten hochbegabter Kinder* [Correlations between attachment type, exploratory behaviour and selected personality traits in gifted children]. https://nbn-resolving.org/urn:nbn:de:bvb:19-23050

Gallagher, James J. (1990): The public and professional perception of the emotional status of gifted children. *Journal for the Education of the Gifted 13* (3), 202–211. https://journals.sagepub.com/doi/pdf/10.1177/016235329001300302

Goldberg, L. R. (1981). Language and individual differences: The search for universals in personality lexicons. In L. Wheeler (Ed.), *Review of personality and social psychology* (pp. 159–181). SAGE PUBLICATIONS INC. https://www.scienceopen.com/document?vid=3cdca9a2-ab50-48bf-97b5-0c2236e65098

Hampson, D. (2006). *Persönlichkeitsmerkmale von hoch begabten Kindern in Förderprogrammen* [Personality traits in gifted children from promotion programs]. University of Zurich.

Herrmann, J., Schmidt, I., Kessels, U., & Preckel, F. (2016). Big fish in big ponds: Contrast and assimilation effects on math and verbal self-concepts of students in within-school gifted tracks. *British Journal of Educational Psychology*, *86*(2), 222–240. https://doi.org/10.1111/bjep.12100

Hoogeveen, L., Van Hell, J. G., & Verhoeven, L. (2009). Self-concept and social status of accelerated and nonaccelerated students in the first 2 years of secondary school in the Netherlands. *Gifted Child Quarterly*, *53*(1), 50–67. https://doi.org/10.1177/0016986208326556

iPEGE (2009). *Professionelle begabtenförderung. empfehlungen zu qualifizierung von fachkräften in der begabtenförderung* [Professional promotion of gifted young people. Recommendations for the qualification of professionals in the promotion of gifted persons]. Salzburg: Österreichisches Zentrum für Begabtenförderung und Begabungsforschung (ÖZBF). https://www.oezbf.at/wp-content/uploads/2017/09/iPEGE_1_web.pdf

iPEGE (2014). *Professionelle Begabtenförderung. Fachdidaktik und begabtenförderung* [Professional promotion of gifted young people. Didactics and promotion of gifted students]. Salzburg: Österreichisches Zentrum für Begabtenförderung und Begabungsforschung (ÖZBF). https://www.oezbf.at/wp-content/uploads/2017/12/iPEGE_4-14-komplett-Standard_01.pdf

Jonkmann, K., Becker, M., Marsh, H. W., Lüdtke, O., & Trautwein, U. (2012). Personality traits moderate the Big-Fish–Little-Pond Effect of academic self-concept. *Learning and Individual Differences*, *22*(6), 736–746. https://doi.org/10.1016/j.lindif.2012.07.020

Jopling, D. A. (1997). A „Self of selves? In U. Neisser & D.A. Jopling (Eds.), *The conceptual self in citext: Culture, experience, self-understanding* (pp. 249-267). New York: Cambridge University Press.

Kalashi, Z. D., Shokrzadeh, S., & Kamkari, K. (2018). Investigating The Personality Traits of Gifted Adolescents. *Revista Romaneasca Pentru Educatie Multidimensionala*, *10*(1, 1), 47–63. https://doi.org/10.18662/rrem/36

Košir, K., Horvat, M., Aram, U., & Jurinec, N. (2016). Is being gifted always an advantage? Peer relations and self-concept of gifted students. *High Ability Studies*, *27*(2), 129–148. https://doi.org/10.1080/13598139.2015.1108186.

Leary, M. R., & Tangney, J. P. (2003). The self as an organizing construct in the behavioral and social sciences. In M. R. Leary & J. P. Tangney (Eds.), *Handbook of self and identity* (pp. 3-13). New York, NY, USA: The Guildford Press.

Lewis, J. D., & Knight, H. V. (2000). Self-concept in gifted youth: An investigation employing the Piers-Harris subscales. *Gifted Child Quarterly*, *44*(1), 45–53. https://doi.org/10.1177/001698620004400105

Limont, W., Dreszer-Drogorób, J., Bedyńska, S., Śliwińska, K., & Jastrzebska, D. (2014). "Old wine in new bottles"? Relationships between overexcitabilities, the Big Five personality traits and giftedness in adolescents. *Personality and Individual Differences*, *69*, 199–204. https://doi.org/10.1016/j.paid.2014.06.003

Lombroso, C. (1895). *The man of genius.* London: Walter Scott.

Mammadov, S., Cross, T. L., & Ward, T. J. (2018). The Big Five personality predictors of academic achievement in gifted students: Mediation by self-regulatory efficacy and academic motivation. *High Ability Studies*, *29*(2), 111–133. https://doi.org/10.1080/13598139.2018.1489222

Marsh, H. W. (1990). The structure of academic self-concept: The Marsh/Shavelson model. *Journal of Educational Psychology*, *82*(4), 623. https://doi.org/10.1037/0022-0663.82.4.623

Marsh, H. W. (2005). Big-fish-little-pond effect on academic self-concept. *Zeitschrift für Pädagogische Psychologie, 19,* 119-127. https://doi.org/10.1024/1010-0652.19.3.141.

Marsh, H. W., & Seaton, M. (2013). Academic self-concept. *International Guide to Student Achievement*, *62*, 62–63.

McCoach, D. B., & Siegle, D. (2003). The structure and function of academic self-concept in gifted and general education students. *Roeper Review*, *25*(2), 61–65. https://doi.org/10.1080/02783190309554200

McCrae, R. R., & Costa Jr., P. T. (2008). The Five Factor Theory of personality. *Handbook of Personality: Theory and Research*, 159–181. https://doi.org/10.1016/S0191-8869(97)81000-8

McCrae, R. R., Costa, P. T., Terracciano, A., Parker, W. D., Mills, C. J., De Fruyt, F., & Mervielde, I. (2002). Personality trait development from age 12 to age 18: Longitudinal, cross-sectional, and cross-cultural analyses. *Journal of Personality and Social Psychology*, *83*(6), 1456–1468. https://doi.org/10.1037/0022-3514.83.6.1456

Mischel, W., & Morf, C. C. (2003). The self as a psycho-social dynamic processing system: A meta-perspective on a century of the self in psychology. In M. R. Leary & J. P. Tangney (Eds.), *Handbook of self and identity* (pp. 15-43). New York: The Guildford Press.

Norman, W. T. (1963). Toward an adequate taxonomy of personality attributes: Replicated factor structure in peer nomination personality ratings. *The Journal of Abnormal and Social Psychology, 66*(6), 574–583. https://doi.org/10.1037/h0040291

Norman, W. T., & Goldberg, L. R. (1966). Raters, ratees, and randomness in personality structure. *Journal of Personality and Social Psychology*, *4*(6), 681. https://doi.org/10.1037/h0024002

Ostendorf, F., & Angleitner, A. (2004). *Neo-Persönlichkeitsinventar nach Costa und McCrae: Neo-PI-R; Manual (Revidierte Fassung)* [NEO-Five-Factor Inventory from Costa and McCrae: NEO-PI-R; manual (rev. ed.)]. Göttingen: Hogrefe.

Pervin, L. A., Cervone, D., & John, O. P. (2005). *Persönlichkeitstheorien* [Personality: Theory and Research] (5. ed.). Reinhardt.

Plucker, J. A., & Stocking, V. B. (2001). Looking Outside and Inside: Self-Concept Development of Gifted Adolescents. *Exceptional Children*, *67*(4), 535–548. https://pdfs.semanticscholar.org/4561/833ece893da707b39d9f7d2810cbe99e922c.pdf

Poropat, A. E. (2009). Personality and academic performance meta-analysis. *Psychological Bulletin*, *135*(2), 322–380.

Preckel, F., & Brüll, M. (2009). The benefit of being a big fish in a big pond: Contrast and assimilation effects on academic self-concept. *Learning and Individual Differences*, *20*(5), 522–531. https://doi.org/https://doi.org/10.1016/j.lindif.2009.12.007

Preckel, F., Schmidt, I., Stumpf, E., Motschenbacher, M., Vogl, K., Scherrer, V., & Schneider, W. (2019). High-Ability Grouping: Benefits for Gifted Students' Achievement Development Without Costs in Academic Self-Concept. *Child Development*, *90*(4), 1185-1201. https://doi.org/10.1111/cdev.12996

Richards, J., Encel, J., & Shute, R. (2003). The Emotional and Behavioural Adjustment of Intellectually Gifted Adolescents: A multi-dimensional, multi-informant approach. *High Ability Studies*, *14*(2), 153–164. https://doi.org/10.1080/1359813032000163889

Rinn, A. N. (2006). Effects of a Summer Program on the Social Self-Concepts of Gifted Adolescents. *Journal of Advanced Academics*, *17*(2), 65–75. https://doi.org/10.4219/jsge-2006-682

Ritchotte, J. A., Suhr, D., Alfurayh, N. F., & Graefe, A. K. (2016). An Exploration of the Psychosocial Characteristics of High Achieving Students and Identified Gifted Students: Implications for Practice. *Journal of Advanced Academics*, *27*(1), 23–38. https://doi.org/10.1177/1932202X15615316

Rohrmann, T. (2009). *Individuelle Förderung begabter Grundschüler* [Individual promotion of gifted primary school students]. Wiesbaden: Springer-VS.

Rost, D. H. (1993). Persönlichkeitsmerkmale hochbegabter Kinder [Personality traits of gifted children]. In D. H. Rost (Ed.), *Lebensumweltanalyse hochbegabter Kinder* [Life environmenal analysis of highly gifted children] (pp. 105–137). Göttingen: Hogrefe.

Rost, D. H., Sparfeldt, J. R., & Schilling, S. R. (2007). *Differentielles schulisches Selbstkonzept-Gitter mit Skala zur Erfassung des Selbstkonzepts schulischer Leistungen und Fähigkeiten: Disk-Gitter mit SKSLF-8 Sparfeldt* [DISK-GRID with SKSLF-8. Differential Academic Self-Concept Grid with a Scale to Assess the Self-Concept of Academic Achievements and Abilities]. Göttingen [u.a.]: Hogrefe.

Rost, D. H., & Hanses, P. (2000). Selbstkonzept [Self-concept]. In D. H. Rost (Ed.), *Hochbegabte und hochleistende Jugendliche: Neue Ergebnisse aus dem Marburger Hochbegabtenprojekt* [Highly gifted and highly performing adolescents: New results from the project for highly gifted adolescents of Marburg] (pp. 211–278). Münster: Waxmann.

Rudasill, K. M., Capper, M. R., Foust, R. C., Callahan, C. M., & Albaugh, S. B. (2009). Grade and gender differences in gifted students' self-concepts. *Journal for the Education of the Gifted*, *32*(3), 340–367. https://doi.org/10.4219/jeg-2009-862

Sarouphim, K. (2011). Gifted and Non-Gifted Lebanese Adolescents: Gender Differences in Self-Concept, Self-Esteem, and Depression. *International Education*, *41*(1), 26–41. https://search.proquest.com/openview/9dad6e27f0dcd5057e3f96ad8b716d05/1?cbl=33115&pq-origsite=gscholar

Schöne, C., Dickhäuser, O., Spinath, B., & Stiensmeier-Pelster, J. (2012). *Skalen zur Erfassung des schulischen Selbstkonzepts (SESSKO)* [Academic self-concept scales]. Göttingen: Hogrefe.

Schulthess-Singeisen, L., Herzog, W., & Neuenschwander, M. P. (2008). Development of academic self-concept of primary school children nominated as gifted by their teachers. *Psychologie in Erziehung Und Unterricht*, *55*(2), 143–151. https://doi.org/10.5167/uzh-6181

Shavelson, R. J., Hubner, J. J., & Stanton, G. C. (1976). Self-concept: Validation of construct interpretations. *Review of Educational Research*, *46*(3), 407–441. https://doi.org/10.3102/00346543046003407

Sternberg, R. J., & Davidson, J. E. (Eds.). (2005). *Conceptions of giftedness*. Cambridge University Press. https://doi.org/10.1017/cbo9780511610455

Sturma A., Ritschl V., Dennhardt S., Stamm T. (2016) Reviews. In: Ritschl V., Weigl R., Stamm T. (eds.) *Wissenschaftliches Arbeiten und Schreiben. Studium Pflege, Therapie,* Gesundheit [Scientific work and writing. Study nursing, therapy, health]. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-662-49908-5_8

Terman L. M. (1925). *Genetic Studies of Genius.* Stanford, CA: Stanford University Press.

Tupes, E. C., & Christal, R. E. (1961). *Recurrent personality factors based on trait ratings (USAF ASD Technical Report No. 61-97).* Lackland Air Force Base, Texas: U.S. Air Force. https://doi.org/10.21236/ad0267778

Tupes, E. C, & Christal, R. E. (1992). Recurrent personality factors based on trait ratings. Journal of Personality, 60, 225-251. https://doi.org/10.1111/j.1467-6494.1992.tb00973.x

van der Meulen, R. T., van der Bruggen, C. O., Spilt, J. L., Verouden, J., Berkhout, M., & Bögels, S. M. (2014). The Pullout Program Day a Week School for Gifted Children: Effects on Social-Emotional and Academic Functioning. *Child and Youth Care Forum*, *43*(3), 287–314. https://doi.org/10.1007/s10566-013-9239-5

Vogl, K., & Preckel, F. (2014). Full-time ability grouping of gifted students: Impacts on social self-concept and school-related attitudes. *Gifted Child Quarterly*, *58*(1), 51-68. https://doi.org/10.1177/0016986213513795

Wegner, C. (2014). Fachdidaktik Biologie / Naturwissenschaften [Didactics Biology / STEM]. In iPEGE (2014). *Professionelle Begabtenförderung. Fachdidaktik und Begabtenförderung* [Professional gifted education. Didactics and gifted education] (pp. 215–230) Salzburg: ÖZBF.

Wirthwein, L., Bergold, S., Preckel, F., & Steinmayr, R. (2019). Personality and school functioning of intellectually gifted and nongifted adolescents: Self-perceptions and parents' assessments. *Learning And Individual Differences*, *73*, 16–29. https://doi.org/10.1016/j.lindif.2019.04.003

Yeung, A. S., Chow, A. P. Y., Chow, P. C. W., & Liu, W. P. (2005). *Self-Concept of Gifted Students : The Reddening and Blackening Effects , Hong Kong Institute of Education Alan , Hong Kong Institute of Education Phoebe Ching Wa Chow , Hong Kong Council of the Church of Christ in Ch*. https://eric.ed.gov/?id=ED490058

Zeidner, M., & Shani-Zinovich, I. (2011). Do academically gifted and nongifted students differ on the Big-Five and adaptive status? Some recent data and conclusions. *Personality and Individual Differences*, *51*(5), 566–570. https://doi.org/10.1016/j.paid.2011.05.007

Author Information

Colin Peperkorn
Bielefeld University
Faculty of Biology
Universitätsstraße 25, 33615 Bielefeld
Germany
Contact e-mail: *colin.peperkorn@uni-bielefeld.de*

Claas Wegner
Bielefeld University
Faculty of Biology
Universitätsstraße 25, 33615 Bielefeld
Germany