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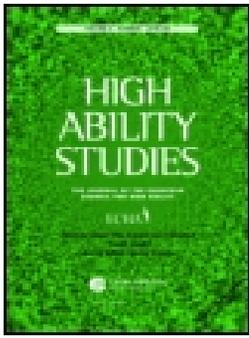
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Sense of belonging or feeling marginalized? Using PISA 2012 to assess the state of academically gifted students within the EU

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ABSTRACT

There are two competing stereotypes of gifted students: harmony theory (gifted students are well adjusted and successful in life) and disharmony theory (giftedness forms a threat to a harmonious development). In this context, the PISA 2012 data were used to explore middle-school students' experiences in terms of sense of belonging, student–teacher relations and attitudes toward school concerning learning activities/outcomes. Fifteen-year-old students from 13 European countries were selected for this data-set (normative = 79,550, gifted = 1956). Student's scores on the four scales were tested for significant differences with students from that same country. Tests revealed no significant differences for 55% of the comparisons, 40% of comparisons had positive effect sizes for gifted students, and 4% had negative effect sizes. The evidence presented in this study supports the existence of harmony theory. More specifically, the vast majority of gifted students in this study reported equal or higher level of belonging. Contained within the findings in this study on students' to the sense of belonging is a lack of evidence of gifted students reporting higher levels of loneliness. These findings strongly reflect the Terman's assertion almost a century ago stating the lack of gifted children tending to be more socially maladjusted.

KEYWORDS

Gifted students; academic integration; sense of belonging; European Union; student–teacher relationship; PISA

Introduction

It should go without saying that a nation's resources of intellectual talent are among the most precious it will ever have. (Terman, 1925, p. V)

In the current academic discourse concerning gifted students, there exist two competing stereotypes: harmony theory vs. disharmony theory. Harmony theory suggests that gifted students are well adjusted and successful in life. This

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stereotype stems from the seminal work by Terman, where he asserts “there is no evidence from these reports that gifted children tend more often than others to be socially maladjusted” (1925, p. 433). Building on this, Persson (1998) identified that teachers’ conceptions about the character traits of gifted children are stereotypical in which teachers attributed qualities such as independence, initiative takers, more compliant, and cooperative to gifted children. Additionally, Baker (1995) reported no differences between regular students and gifted students in levels of depression or suicide idealization. Martin, Burns, and Schonlau (2010) conducted an extensive review of the epidemiologic literature investigating published differences between gifted and normative students. In this literature review, there were no significant differences found between gifted and normative students for depression, suicidal ideation, or sustained attention tests (Tests of Variables of Attention). In the nine articles reviewed that focused on anxiety, significant lower levels of anxiety were found in gifted students compared to their non-gifted peers.

On the other hand, disharmony theory asserts that high intellect comes at a cost. Gifted students are seen as possessing many characteristics that have been suggested as risk factors: sensitivity, intensity, and over-excitabilities (Peterson, 2009). Gallagher in his editorial “The Public and Professional Perception of the Emotional Status of Gifted Children” (1990) reports that gifted children are more pessimistic than their non-gifted peers and have the potential to develop deep levels of guilt due to their perceived own higher levels of talent and capabilities compared to non-gifted children. Manaster and Powell (1983) add: “certain kinds of problems are more probable for gifted adolescents” (p. 70) such as social and psychological difficulties. Heller (2005) maintains that giftedness forms a threat to a harmonious development in students. Additionally, concerns about the effect of acceleration on gifted students’ social and emotional well-being have also been identified in the literature (Brookhart, 1993).

Integration and engagement

School experiences for gifted students can be examined through their interactions and relationships with: classmates (sense of belonging), teachers, and the curriculum. This forms the foundation for integration into an academic community (Tinto, 1975). Integration for Tinto is a combination of two types of interactions: academic and social. Academic integration is achieved by frequent and quality interactions with teachers or peer-students concerning school-related issues (e.g. homework, assessments, lectures, and etc.). On the other hand, frequent and quality interactions with teachers or peer-students concerning non-school-related issues (e.g. hobbies, sports, current events, and etc.) can lead to social integration.

In other words, the more students feel that they belong to a group and have interactions with that group’s members, in this case the academic community, the

higher their integration into that group. If students are academically integrated, the higher their engagement will be and thus feel a greater sense of being part of the classroom discourse (Reid & Solomonides, 2007). This notion of students' "sense of belonging" is often used as a proxy for integration and thus an indicator of both study success (Kahu, 2013; Meeuwisse, Severiens, & Born, 2010) as well as, academic persistence (Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008; Thomas, 2002).

Relationships with classmates (Sense of belonging)

The ability to make and keep friends has been reported as one of the hardest challenges of gifted adolescents (Peterson, Duncan, & Canady, 2009; Piechowski, 2006). Salmela and Määttä (2015) found in their study that straight "A" students found it difficult to maintain their high grades and have many friends. Peterson et al. (2009) focused on negative life events of gifted students over an 11-year period. "The strongest language and most elaboration in connection with challenges occurred when students wrote about social difficulties or concerns about distressed peers." (Peterson et al., 2009, p. 40). Loneliness in gifted students has also been recognized in combination with depression and anger (Kaiser & Berndt, 1985). In this study, one in eight of the gifted participants reported significant levels of loneliness, depression, and anger.

Additionally, gifted students' sense of belonging can be put in jeopardy if they feel marginalized by not fitting into any group within the classroom (Manaster & Powell, 1983; Peterson et al., 2009). Isolation and social issues are frequent topics of stress for gifted students.

Relationships with teachers

Teachers' views of gifted students tend to be mixed depending on the gender of the student and the ways in which gifted students display their intellect. Geake and Gross (2008) found that while teachers recognized advanced academic capabilities of gifted students, they harbored negative beliefs toward them and ascribed negative characteristics to gifted students such as disrespectful to authority, elitist, or superior, or too critical, and insensitive to hurting the feelings of other students. Gifted students who exhibit behaviors that can be viewed as "teacher-pleaser behaviors" (conformity, working quietly) tend to be more often recommended for special gifted programming. On the other hand, gifted students who do not engage in such teacher-pleasing behavior may not be recommended for gifted programs (Harradine, Coleman, & Winn, 2014). This being said, the role of teachers and more specifically the quality of support and openness of teachers, plays a crucial role in students' participation in the academic community (Freeman, Anderman, & Jensen, 2007; Parkes, 2014).

Relationship with the curriculum

The mismatch between the specific educational needs of gifted students and the offered curriculum may lead to underachievement or disengagement with school (Landis & Reschly, 2013). The notion of gifted underachievers creates the impression of an oxymoron; a concept that remains difficult for many to grasp. Since gifted students possess high intellect they are expected to perform well in school (Hoover-Schultz, 2005). However, this is not always the case. Gifted students drop-out of school at a rate similar to their peers (Matthews, 2006). Tomlinson et al. (2009) note the importance of matching the curriculum to students' individual needs. "There is a substantial body of theory and research to suggest that a student will learn best when curriculum and instruction are congruent with a learner's particular needs" (p. 11). Additionally, VanTassel-Baska stressed the importance of curriculum: "without a challenging curriculum, well-delivered and appropriately assessed, there is no viable gifted program that is defensible." (2000, p. 14).

Assessing engagement via the programme for international student assessment (PISA)

PISA is a global study by the Organisation for Economic Co-operation and Development (OECD). The aim of this project is to assess students' performance on mathematics, science, and reading. Similar to earlier versions, the 2012 version also included questions about student engagement and attitudes toward school. The PISA data-set contains more than 400,000 15-year-old students representing 65 nations.

The PISA questionnaire builds the concept of engagement by including constructs such as sense of belonging, attitudes toward school (toward learning activities and learning outcomes), and teacher–student relations (OECD, 2013). The sense of belonging scale includes nine items and focuses on social connectedness (e.g. make friends easily or feel awkward and out of place). Attitudes toward school contain two scales: attitudes toward learning activities and learning outcomes. The learning activities scale has four items and focuses on the perceived importance of and pleasure students receive from working hard at school (e.g. I enjoy receiving good grades and trying hard at school is important). The learning outcomes scale also has four items, but a different focus: the perceived importance of school for their future (e.g. school has done little to prepare me for adult life when I leave school and School has taught me things which could be useful in a job). Perceived quality of teacher–student relations contained were five items (e.g. most teachers are interested in students' well-being and most of my teachers really listen to what I have to say).

Gifted education in the European Union

Although the European Union has created an economic union of 28 countries, there still is wide disparity among the countries when it comes to the education of its citizens. These variances also extend to gifted education. Policies for gifted education throughout Europe are quite diverse. Some countries have virtually no provisions for educational modifications, others have moderate policies such as early entry to kindergarten, while a few countries include curriculum modification and flexibility at every educational level (Hoogeveen, 2015). The differences in providing curricular modification illustrate the tension between identifying and meeting the needs of gifted learners on one side and societal beliefs regarding the individual abilities and the roles of the school on the other.

Mönks and Pflüger (2005) investigated 21 European Union member countries in regards to their provision of services for gifted learners (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Luxemburg, Netherlands, Poland, Portugal, Romania, Slovenia, Spain, Sweden, Switzerland, and United Kingdom). Only eight countries, (Austria, Switzerland, Germany, Spain, Hungary, Poland, Romania, and Slovenia) explicitly used the term giftedness in current legislation and five countries (Belgium, Ireland, Luxemburg, Netherlands, and Sweden) recognized gifted students as a specific subgroup of students with unique needs. Having said this, all 21 countries acknowledged that guidelines for gifted education are set by the local school authority.

Though the years, the European Union has indirectly focused on gifted students. In 1995, the European Union declared 1996 as the “European Year of Lifelong Learning” as an initiative to offer high quality education that focused on lifelong learning, in order to enable its inhabitants to fully contribute to a modern democratic society. These initiatives were connected to both economic as well as, social growth. They also specifically addressed the need to promote creativity and innovation during all stages of lifelong learning. Through a higher awareness of the importance of talent development, creativity and innovation for modern economies, educational opportunities that apply to gifted students have received more focus. However, this focus comes through a lens that is not specifically aimed at the unique needs of gifted students.

Current research focus

Against this complex background, the current research aims to investigate the existence of either harmony or disharmony in gifted students within the European Union by assessing students’ engagement with and at school. This research utilizes the Programme for International Student Assessment (PISA) 2012 data-set. More specifically, this study will focus on four engagement scales contained in PISA:

sense of belonging, perceived student–teacher relationships, attitudes toward school concerning learning activities, and attitudes toward school concerning learning outcomes.

In order to ascertain the existence of harmony or disharmony in gifted students, two groups of students will be created in the PISA data-set; gifted and normative students. Harmony or disharmony theory will be tested by comparisons of these two groups within the same country.

The main research question driving this study is as follows:

- Is there evidence of harmony or disharmony in gifted students when compared to normative students in their country?

To investigate this question, four sub-questions have been formulated:

- Are there differences in “sense of belonging” between gifted and normative students per country?
- Are there differences in “perceived student-teacher relations” between gifted and normative students per country?
- Are there differences in “attitudes toward school concerning learning activities” support between gifted and normative students per country?
- Are there differences in “attitudes toward school concerning learning outcomes” between gifted and normative students per country?

Method

Participants

The PISA survey has its focus on 15-year-old students. The 2012 PISA survey contains more than 510,000 students worldwide. Pisa reported an age range from 15 years and 3 months to 16 years and 2 months. A total of 65 countries participated in 2012, 34 OECD member countries, and 31 partner countries (OECD, 2013).

PISA and IQ

In this project, the identification of academically gifted students¹ in the PISA data-set is based upon the work of Rindermann (2007) and Weiss (2009). Both of these studies demonstrate a high correlation between all the facets of the PISA (math, science, and reading) with national IQ scores (for a detailed overview see Rindermann, 2007). In this study, math scores were used to identify academically gifted students. This is due to the fact that all three facets of the PISA heavily focus on cognitive ability, and therefore there is no essential difference between solely using students’ math score instead of combined scores for all three facets (Rindermann, 2007; Weiss, 2009). Contained in the PISA 2012 data-set are five plausible math score values for each student. All five plausible values were then ranked per student for 95 percentile within the whole

data-set ($n = 485,490$). However, this ranking process was executed per gender. This is akin to similar techniques employed in earlier studies of mathematical giftedness (Lubinski & Humphreys, 1990; Roznowski, Hong, & Reith, 2000). Only when all five plausible scores were ranked in the 95 percentile were students labeled as gifted. This resulted in 2.2% ($n = 10,886$) labeled as gifted and 97.8 ($n = 474,604$) as normative.

Instruments

The Sense of belonging scale includes nine items and focuses on social connectedness (e.g. make friends easily or feel awkward and out of place). Since four items were negatively formulated, these items were recoded. However, reliability tests revealed a non-acceptable value ($\alpha < .70$) (Cronbach, 1951) for this scale. Reliability tests revealed that two items, if removed, would lead to an acceptable reliability level. Since the scale focuses on social connectedness, these two items were examined in terms content to ascertain whether their removal would endanger this scale's validity. Taking this into account, the two items, "things are ideal at school" (ST87Q08) and "satisfied at school" (ST87Q09) were deemed to focus on students' perceptions about the school environment rather than "social connectedness." Therefore, these two items were eliminated and an acceptable reliability level was achieved ($\alpha = .82$).

The attitudes toward school (learning activities) scale contains four items and assessed students' perceptions about the utility of school in terms of getting a good job, getting into college, enjoyment of receiving good grades, and the importance of effort at school. The answer anchors ranged from 1, strongly agree to 4, strongly disagree. Reliability tests for this scales were acceptable ($\alpha = .79$). The attitudes toward school (learning outcomes) scale also contained four items and assessed students' perceptions about the effect of school in terms of preparing for adult life, a waste time, confidence to make decisions, and taught me things which could be useful in a job. The answer anchors ranged from 1, strongly agree to 4, strongly disagree. Reliability tests for this scales were acceptable ($\alpha = .70$). The scale teacher-student relations assessed five aspects of students' perception of the teacher-student relationship such as; getting along well with most of one's teachers, teacher's interests in student's well-being, teachers really listening, receiving extra help from teachers when needed, and being treated fairly by teachers. The answer anchors ranged from 1, strongly disagree, to 4, strongly agree. Reliability tests for this scales were acceptable ($\alpha = .82$).

Country selection

Twenty-six EU member states participated in the 2012 version of PISA: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden,

Table 1. Descriptive statistics of participants per country.

	Normative	Gifted students
Belgium	5152	295
Czech Republic	3285	165
Estonia	3069	94
Finland	5556	126
France	2907	83
Germany	2647	122
Italy	20,128	352
Netherlands	2762	93
Poland	2893	142
Slovak Republic	2980	72
Slovenia	3694	74
Spain	16,342	196
United Kingdom	8135	142

and the United Kingdom. Careful consideration was taken in the selection of countries for this study which led to a selection of countries ($n = 13$) that had more than 70 academically gifted students. This was partly based on achieving a balance between both having enough students in each country's sample and including enough EU ($n = 13$) countries to best answer the research question (Table 1).

Data analysis

OECD recommends the use of effect sizes in the analysis of PISA data-set (Programme for International Student Assessment, & Organisation for Economic Co-operation & Development, 2009). Therefore, effect sizes for differences in mean scores between academically gifted and normative students from the same country were calculated using Hedges' g . This slightly more conservative effect size estimation as it is an extension of Cohen's d and included a correction for sample size bias. Cohen (1988) suggests the following magnitudes for interpretation: small .20, medium .50, and large .80. Additionally, Sawilowsky (2009) has suggested an expansion to these magnitudes: very small .10, very large 1.2, and huge 2.0. Please note that the PISA data-set does include standardized indices, however, these indices allow researchers to make cross-national comparisons for certain scales in the PISA data-set. Since this research project's goal is to investigate intra-country differences between academically gifted and normative students, scales scores and effects sizes will be reported.

Results

Sense of belonging

For 69% of the Countries ($n = 9$), tests for mean differences revealed no significant differences ($p > .05$) for sense of belonging between academically gifted and

Table 2. International comparisons: Gifted vs. normative students and sense of belonging.

	Normative		Gifted		<i>p</i>	Hedges' <i>g</i>	95% CI
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Belgium	3.15	.48	3.19	.42	.18	.08	.10–.07
Czech Republic	3.04	.46	3.07	.46	.40	.07	.08–.05
Estonia	3.06	.47	3.11	.47	.31	.11	.12–.09
Finland	3.13	.50	3.08	.47	.24	.10	.09–.11
France	3.07	.47	3.24	.46	.00	.36	.38–.34
Germany	3.33	.51	3.35	.44	.67	.04	.06–.02
Italy	3.17	.48	3.22	.42	.05	.10	.11–.10
Netherlands	3.19	.43	3.21	.40	.68	.05	.06–.03
Poland	3.08	.49	3.10	.50	.60	.04	.06–.02
Slovak Republic	2.99	.47	3.15	.31	.00	.34	.36–.33
Slovenia	3.18	.48	3.33	.41	.01	.31	.33–.30
Spain	3.35	.48	3.32	.44	.45	.06	.06–.07
United Kingdom	3.15	.50	3.21	.43	.09	.12	.13–.011

Table 3. International comparisons: Gifted vs. normative students student–teacher relations.

	Normative		Gifted		<i>p</i>	Hedges' <i>g</i>	95% CI
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Belgium	2.10	.51	2.01	.43	.01	.18	.16–.19
Czech Republic	2.14	.52	2.10	.45	.38	.08	.06–.09
Estonia	2.07	.48	1.97	.43	.07	.21	.19–.23
Finland	2.05	.52	2.01	.36	.41	.08	.06–.09
France	2.13	.55	2.01	.47	.04	.22	.20–.24
Germany	2.17	.60	2.03	.41	.01	.24	.21–.26
Italy	2.14	.58	2.15	.49	.74	.02	.03–.01
Netherlands	2.10	.44	1.98	.38	.04	.27	.26–.29
Poland	2.27	.58	2.28	.55	.83	.02	.04–.00
Slovak Republic	2.13	.51	2.14	.45	.85	.02	.04–.00
Slovenia	2.15	.55	2.03	.45	.06	.22	.20–.24
Spain	2.09	.57	2.02	.46	.10	.12	.11–.13
United Kingdom	1.95	.52	1.75	.44	.00	.39	.37–.40

normative students in that country. Of the remaining four countries, Hedges' *g* effect sizes revealed three countries with small to medium positive effect ($g = .31$ to $.36$) and one country with a less than small positive effect ($g = .10$) (Table 2).

Student–teacher relations

For 62% of the Countries ($n = 8$), tests for mean differences revealed no significant differences ($p > .05$) for student–teacher relations between academically gifted and normative students in that country. Hedges' *g* effect sizes revealed one country with a less than small positive effect ($g = .18$). Additionally, effect size tests for scores for academically gifted students from four countries revealed a small to moderate positive effect ($g = .22$ to $.39$) (Table 3).

Table 4. International comparisons: Attitudes toward school concerning learning activities gifted vs. normative students.

	Normative		Gifted		<i>p</i>	Hedges' <i>g</i>	95% CI
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Belgium	1.73	.49	1.70	.44	.42	.06	.05–.07
Czech Republic	1.70	.50	1.84	.48	.00	–.28	–.30 to –.26
Estonia	1.62	.49	1.63	.45	.81	.02	.04–.00
Finland	1.62	.50	1.53	.45	.04	.18	.17–.19
France	1.62	.51	1.55	.47	.19	.14	.12–.16
Germany	1.52	.48	1.45	.45	.15	.15	.13–.16
Italy	1.63	.50	1.58	.45	.03	.10	.09–.11
Netherlands	1.72	.48	1.64	.46	.10	.17	.15–.18
Poland	1.79	.52	1.76	.52	.48	.06	.04–.08
Slovak Republic	1.77	.50	1.75	.47	.73	.04	.02–.06
Slovenia	1.63	.50	1.51	.42	.04	.24	.22–.26
Spain	1.54	.51	1.41	.43	.00	.26	.25–.26
United Kingdom	1.43	.48	1.27	.36	.00	.33	.32–.34

Table 5. International comparisons: Attitudes toward school concerning learning outcomes gifted vs. normative students.

	Normative		Gifted		<i>p</i>	Hedges' <i>g</i>	95% CI
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Belgium	2.01	.50	1.91	.45	.00	.20	.19–.21
Czech Republic	2.07	.49	2.01	.47	.10	.12	.11–.14
Estonia	1.94	.49	1.89	.49	.43	.10	.08–.12
Finland	1.92	.51	1.76	.45	.00	.31	.30–.33
France	1.92	.53	1.72	.50	.00	.38	.36–.40
Germany	2.00	.59	2.02	.54	.81	.03	.06–.01
Italy	1.96	.52	1.85	.49	.00	.21	.20–.22
Netherlands	2.15	.44	2.06	.37	.13	.21	.19–.22
Poland	2.21	.58	2.29	.60	.08	.14	.16–.12
Slovak Republic	2.09	.50	2.03	.52	.32	.12	.10–.14
Slovenia	1.97	.51	1.88	.41	.12	.18	.16–.19
Spain	1.85	.54	1.69	.54	.00	.30	.29–.30
United Kingdom	1.89	.53	1.78	.49	.01	.21	.20–.22

Attitudes toward school concerning learning activities

For 53% of the Countries ($n = 7$), tests for mean differences revealed no significant differences ($p > .05$) for student–teacher relations between academically gifted and normative students in that country. Of the remaining six countries, Hedges' g effect sizes revealed three countries with small to medium positive effect ($g = .24$ to $.33$) and two countries with a less than small positive effect ($g = .10$ to $.18$). However, for academically gifted students from the Czech Republic, tests for mean differences revealed a small to moderate negative effect ($g = -.28$) (Table 4).

Attitudes toward school concerning learning outcomes

For 53% of the Countries ($n = 7$), tests for mean differences revealed no significant differences ($p > .05$) for student–teacher relations between academically gifted and

normative students in that country. For all the remaining six countries, Hedges' g effect sizes revealed a small to moderate positive effect ($g = .20$ to $.38$) (Table 5).

Discussion

The main goal of this study was to ascertain if there evidence of harmony or disharmony in intra-country comparisons of gifted students and normative students within the EU in terms of: sense of belonging, perceived student–teacher relationships, attitudes toward school concerning learning activities, and attitudes toward school concerning learning outcomes. In order to achieve this goal, the current research investigated student engagement using the PISA data-set.

This research contributes to the academic literature on engagement and giftedness by employing a large data-set that contains 13 EU Countries to empirically test for harmony or disharmony theory in academically gifted students. To the author's knowledge, this is the first large-scale investigation into this phenomenon (academically gifted = 1956, normative = 79,550). Moreover, the use of intra-country comparisons between academically gifted and normative students allows for the elimination of any potential bias due to specific country differences (i.e. educational and/or cultural). In other words, the presented differences allow for a more in-depth review of how each country's education is experienced between these two types of students.

The main research question driving this study was: "Is there evidence of harmony or disharmony in academically gifted students when compared to normative students in their country?" Negative effect sizes were found for only two (4%) of the 52 intra-country comparisons in this study (13 Countries x 4 scales between academically gifted and normative students). Additionally, 55% of comparisons were not significant. When the scores were significantly different, 91% of these comparisons revealed higher positive scores for academically gifted students. The evidence presented in this study supports the existence of harmony theory. In the following paragraphs, each engagement scale will be presented separately and the evidence supporting harmony theory will be discussed.

Sense of belonging

The Sense of belonging scale included nine items and focused on social connectedness (e.g. make friends easily or feel awkward and out of place). For nine Countries, no significant differences were found between academically gifted and normative students and the remaining other four Countries had positive effects sizes. Manaster and Powell (1983) assert that a higher probability of social difficulties in school for academically gifted adolescents. However, there were neither differences nor negative effect sizes between academically gifted and normative students for items such as: feeling like outsider, making friends easily, and feeling awkward at school. Since academically gifted students reported similar or *higher*

levels for these items, there seems to be a lack of reported social difficulties. In other words, gifted students face either the same or less amount of difficulties than normative students in their country.

Additionally, in that same study, Manaster & Powell (Manaster & Powell, 1983) assert that gifted students' sense of belonging can be put in jeopardy if they feel marginalized by not fitting into any group within the classroom. Since academically gifted students in this study are reporting same or higher levels of belonging, the feeling of fitting into a group within the classroom is present and thus these students are not experiencing school as marginalizing. Loneliness in gifted students has also been previously identified in gifted students (Kaiser & Berndt, 1985) as part of disharmony theory. However, the results in this study support the contrary. The sense of belonging scales specifically included items such as: feeling lonely at school, liked by other students, and feeling happy at school. If gifted students in this study do indeed feel lonely, their reported levels of loneliness are, not significantly different than the levels of loneliness reported by normative students.

Student–teacher relations

In order for students to continue with their studies, they need to integrate into the academic community (Tinto, 1975). Integration is achieved through both the quantity and quality of student–teacher interactions. Therefore, the student–teacher relationship plays a key role in the integration process. Sixty-two percent of countries did not have significant differences while 30% of countries had significantly positive effect sizes when exploring student–teacher relations scores between gifted and normative students. Gifted students in this study generally reported higher levels for the student–teacher relations scale, which included items such as: getting along with teachers, the teachers are interested, teachers listen to students, and teachers treat student fairly. For gifted students, the engagement process is generally more complex (Little, 2012) than for normative students. Gifted students require special curricular attention and instructional differentiation, in general, and specifically for gifted students, this remains a challenge for teachers. If the student–teacher relationship is such that if students feel heard and have the feeling that teachers are listening, then there is less of a chance for a perceived mismatch between the curriculum and gifted students. When a mismatch does occur, it increases the risk for underachievement in gifted students and can eventually lead to departure from the education system (Landis & Reschly, 2013). However, this study does not contain indications that gifted students are struggling with integration in terms of student–teacher interactions. On the contrary, gifted students generally report higher levels of integration in terms of the perceived quality of their interactions with teachers.

Relationship with the curriculum

Attitudes toward school concerning learning activities

Slightly more than half of the intra-country comparisons (53%) revealed no significant differences between gifted and normative students. For the remaining six countries, five countries had a small or a small to moderate positive effect size and one country had a moderate negative effect size (Czech Republic, $g = -.28$). This means that academically gifted students do not report a mismatch between their specific educational needs and the curriculum they are receiving. Moreover, 46% of the country comparisons revealed a more positive attitude toward their curriculum compared to normative students. This seems to be evidence that they are receiving a viable (VanTassel-Baska, 2000) curriculum that contains the correct amount of challenge, is properly implemented, and appropriately assessed.

Attitudes toward school concerning learning outcomes

Slightly more than half of the intra-country comparisons (53%) revealed no significant differences between academically gifted and normative students. For all the remaining six countries, Hedges' g effect sizes revealed a small to moderate positive effect ($g = .21$ to $.38$). This means that academically gifted students had similar or more positive attitudes than normative students toward the effect of school in preparing for adult life, confidence to make decisions, and being taught things which could be useful in a job.

Limitations and future research

This research explored intra-country differences between academically gifted and normative students. However, in such a large scale data-set as PISA 2012 student data, the specific contextual factors, such as school environment and types of classrooms, classroom size, and teacher quality are not taken into consideration. Additionally, many secondary schools have separate tracks for students of differing ability and future scholastic aspirations. These tracks are more homogeneous in terms of types of students and student backgrounds. This being said, the perception of the sense of belonging might be augmented as opposed to school situations where classrooms are heterogeneous. Future studies should explore what effect, if any, heterogeneous/homogeneous grouping approaches have on students' perceived sense of belonging.

Conclusion

For the last 40 years, the student engagement literature has been dominated by the work of Tinto and his model on student persistence. Tinto, employing an interactionist approach, asserts that engagement occurs when students are able to integrate into the academic community. However, integration is achieved through

both the quantity and quality of student–teacher and student–student interactions (Tinto, 1975). The more students feel that they belong to a group and have interactions with that group’s members, in this case the academic community, the higher their integration into that group. Additionally, the benefits of students being engaged in their studies have also been well documented: higher level of academic success (Astin, 1984; Carini, Kuh, & Klein, 2006; Tinto, 1988; You & Sharkey, 2009) greater sense of being part of the classroom discourse (Reid & Solomonides, 2007), greater sense of pride and satisfaction (Skinner & Belmont, 1993), earn higher grades, score higher on standardized tests of achievement (Skinner & Belmont, 1993), and reducing underachievement, especially in gifted students (Landis & Reschly, 2013).

However, the fact that two competing stereotypes (harmony theory vs. disharmony theory) in the current academic discourse concerning gifted students exists creates difficulties in assessing the well-being, promoting academic success, and creating a curriculum for gifted students. Additionally, many of the “issues” raised concerning gifted students are viewed as causes for their difficulties (i.e. socially inept, and over sensitive), but may be in fact reactions to repeated exposure to a mismatch in their curriculum, being treated as misfits, and viewed as socially maladjusted. Moreover, teachers’ conceptions as to what a gifted student is by assigning attributes such as independence, initiative takers, more compliant and cooperative may be rooted more in teachers’ own epistemology and may not necessarily be built upon scientific evidence.

The 2012 PISA data-set offers the opportunity to assess four important aspects of student engagement that can allow a rich and deep view of the state of giftedness within the EU. The richness of the current research project can be characterized by the variety of countries contained within the data-set and the large amount of respondents in this study provides depth to the analysis. Having said this, the crucial concerns raised by the proponents of disharmony theory are not evidenced in this study. The potential social and psychological difficulties advanced by these proponents stemming from, for example, curricular acceleration, loneliness, and overexciteabilities are not reflected in the sense of belonging scores in this population. On the contrary, the vast majority of academically gifted students reported equal or higher level of belonging. Additionally, contained within the findings on students’ to the sense of belonging are aspects of loneliness. These findings strongly reflect the seminal work of Terman, almost a century ago. Where he asserts: “there is no evidence... that gifted children tend more often than others to be socially maladjusted” (1925, p. 433).

Note

1. The definition of “gifted students” remains contested in the academic literature. The author’s choice here is in line with the notion of academically gifted students see (Geake & Gross, 2008; Lohman, 2005).

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