Anduli
Revista Andaluza de Ciencias Sociales
ISSN: 1696-0270 • e-ISSN: 2340-4973

NO NAME, NO FAME: A BIBLIOMETRIC ANALYSIS OF PUBLICATIONS OF GIFTEDNESS IN ADULTS

SIN NOMBRE NO HAY FAMA: UN ANALISIS BIBLIOMETRICO SOBRE ALTAS CAPACIDADES EN ADULTOS

Eduardo Infante Rejano
Universidad de Sevilla
einfante@us.es
https://orcid.org/0000-0002-5252-1858

Annabel Jiménez-Soto
Universidad de Sevilla
ajsoto@us.es
https://orcid.org/0000-0003-3840-7319

Maria-Claudia Scurtu-Tura
Universidad de Sevilla
mscurtu@us.es
https://orcid.org/0000-0003-1914-1084

Mónica Santana
Universidad Pablo de Olavide
msanher@upo.es
https://orcid.org/0000-0003-1761-3180

Abstract

The aim of the present study is to conduct a systematic review and analysis of the literature on gifted adults to explore the state of research in this area. A bibliometric science mapping tool, based on co-word analysis and h-index, is applied using the Science Mapping Analysis Software Tool (SciMAT). Initially, 661 articles published between 1948 and 2022 were retrieved from the Web of Science (WoS). Refined by English language and specific descriptors, 376 results were considered, and 28 themes and 32 clusters were identified as significant in the giftedness literature. Supported by life-span studies and earlier work on ability, data analysis revealed that adult giftedness is an emerging topic of research with a tentative development only a decade ago. The emergence of studies on giftedness in adults appears to be driven not only by cognitive testing (i.e., intelligence studies) or achievement research, but also, and more recently, by life satisfaction studies and the use of qualitative methodologies.

Keywords: adult giftedness, bibliometrics, SciMAT, h-index, thematic evolution, science mapping analysis

Resumen

El objetivo del presente estudio es realizar una revisión sistemática y un análisis de la literatura sobre adultos con altas capacidades para explorar el estado de la investigación en esta área. Se aplica una herramienta de mapeo científico bibliométrico, basada en el análisis de co-palabras y el índice h y se utiliza el software de análisis de mapeo científico (SciMAT). Inicialmente, se recuperaron de Web of Science (WoS) 661 artículos publicados entre 1948 y 2022. Refinados por idioma inglés y descriptores específicos, se consideraron 376 resultados y se identificaron 28 temas y 32 grupos como significativos en la literatura sobre las altas capacidades. Los análisis de datos revelaron que el área de las altas capacidades en adultos es un tema de investigación emergente hace solo una década y nace tímidamente respaldado por los estudios evolutivos y aptitudinales. El origen de esta área de estudio resulta ser impulsado no solo por pruebas cognitivas (es decir, estudios de inteligencia) o investigación sobre el rendimiento, sino también, y más recientemente, por estudios que se centran en cuestiones relacionadas con la satisfacción en la vida y el uso de metodologías cualitativas.

Palabras claves: altas capacidades en adultos, bibliometría, SciMAT, índice H, evolución temática, análisis de mapeo científico.

Cómo citar este artículo/ citation: Infante-Rejano, Eduardo; Scurtu-Tura, María-Claudia; Jiménez-Soto, Annabel; Santana, Mónica (2023). No Name, no Fame: A Bibliometric Analysis of Publications of Giftedness in Adults. ANDULI. Revista Andaluza de Ciencias Sociales, (24), 123-149. https://doi.org/10.12795/anduli.2023.i24.06

Recibido: 11.05.2023. Revisado: 15.06.2023 Aceptado: 25.06.2023 DOI: https://doi.org/10.12795/anduli.2023.i24.06

1. Introduction

The advance of gifted studies in early stages of basic education is a fact that contrasts with the few attempts at expanding what is already known about giftedness in adults. Despite the growing interest in research in the last decade on how giftedness evolves in adulthood (Fiedler, 2015; Brown et al., 2020), there is a widespread opinion that there is still a great deal to learn from gifted adults (Alshehri, 2020; Bazler et al., 2015; Rinn & Bishop, 2015; Silverman, 2013). As stated by Perrone and her team, there is a clear paucity when it comes to refer to the empirical research focusing on gifted adults (Perrone et al., 2007). This is certainly surprising when ponder the question of where all investment in effort and resources throughout the educational system end up after the formal period. In the end, gifted education is about helping gifted individuals to be successfully eminent in their future personal and working lives for the sake of society (Subotnik & Rickoff, 2010). Consequently, the scientific community should be aware of the extent to which gifted adults are being left apart. If is unable to identify, understand, and assist gifted adults, they will never succeed in fulfilling their natural skills and therefore, turning early identification into a waste of time. Although many cases are yet to be unveiled, there are informal estimations indicating that at least one out of two gifted adults will fail or quit from tertiary education while other survey documents figure University gifted underachievers between 50 and 70% (Infante, 2015).

While there is a great deal of surprising information posted via Internet blogs about the characteristics of gifted adult people, the scientific community rarely comments on gifted adults nor gifted workers. Few exceptions are recent research on creativity, emotional intelligence, or coping styles of intellectually gifted adults (Angela & Caterina, 2022; Schlegler, 2022). However, scientific debate about giftedness after adulthood is rare, and training programmes for gifted children are limited to specific talent competitions - usually called Olympiads, contests, tournaments, or fairs - that take place alongside formal, official education. The research evidence regarding the education of gifted and talented children is predominantly based on high cognitive ability and academic testing. However, strategically adapted curricula are seldom implemented in adulthood, when the concept of exceptional talent becomes evident. Under a coaching perspective in both adult social and work spheres, it seems as if *giftedness* concept would have replaced by that other of *talent* after childhood and, in doing so, the consideration of a certain kind of high skills throughout the general population is democratised. Both universities and organizations promote talent programmes, many of which encourage any individual to look for a specific talent regardless IQ. In addition, the decrease in academic demands enables high academic achievements for everyone, and, therefore, moving talent assessment towards the subjective concept of working competence (Kabalina & Osipova, 2022). Talent identification and evaluation process through competences lead practitioners to consider that talent and related phenomena can be trained and not naturally gained. For instance, *impostor syndrome* that was once associated with highly gifted and successful working women of managerial positions (Clance, 1985; Clance & Imes, 1978), is being linked today to general working samples with some studies that even stating that between 58 up to 70% of working people experience the phenomenon at one point in their lives (Bravata et al., 2019).

Talent and giftedness are terms that need to be further distinguished in their definitions and perspectives. While coaching field uses a rather motivational point of view in the attention to adults, there is an urgent need to recover long traditional

literature on cognitive testing and to be able to properly apply it to adult groups (Rayo Lombardo, 2015). Most of the previous studies, however, are just based on youth IQ scores, standardised test scores, academic grades, or adult accomplishments with lack of adequate group comparisons (Rinn & Bishop, 2015). For instance, Terman's classic longitudinal study with 1,500 gifted children, while certainly influential in the field, did not include individuals from underprivileged backgrounds and most of the selected children were White and of middle-to-upper class socioeconomic status (Terman, 1925). In 1971, the American psychologist Julian Stanley from the Johns Hopkins University conducted another longitudinal study with several cohorts that were tracked 3 times at several ages. More than 5,000 children were selected based on the Scholastic Aptitude Test (SAT) in the Mathematically Precocious Youth (SMPY) survey. While general research has certainly found high SAT´s scores indicative of high IQ (Frey & Detterman, 2004), the use of an academic selection criterion may leave behind many gifted underachievers. Another known attempt was longitudinally conducted by Perrone and colleagues in 1988 (published in 2010a), when they carried out a study that followed up with students for more than 20 years. While the production was prolific to acknowledge relevant aspects of gifted adult lives, the extent of those was limited by the lack of inclusion of other psychometric measures other than academic graduation rankings (Perrone et al., 2007, 2010b, 2012). In a more recent study, Maggie Brown and colleagues specifically explored the research with gifted adults using a Delphi technique (Brown et al., 2020). In general, problems with a disciplinary definition of *gifted adult* itself, disconnection between research and practice, and fragmentation of the field were identified by the international respondents. Precisely, experts agreed on holistically and qualitatively expanding the concept of *gifted adult* beyond cognitive skills to capture the complexity of adulthood.

Therefore, sound indicators of adult giftedness referring to both cognitive and non-cognitive assets are still pending to be discovered and improved at the light of expanded definitions of giftedness to also include an individual´s potential and behaviour excellence in the measurement with various methodologies. Precisely, the prospective work should focus on the ways to identify gifted individuals by means of both traditional testing and multisource direct, external criteria that must also include screening tests to avoid time-consuming practices.

Identifying gifted adults is an important duty of education agents and scientists for a variety of reasons. First, from the individual point of view, many adults are unaware of their high skills and remain unproductively silent and awkwardly different on a daily basis. Identifying their giftedness can help them to increase self-awareness and social integration. Second, the understanding of giftedness in adults will certainly help us to erase their potential social maladjustment as being very different from the rest and therefore, ameliorate their mental health. Finally, and perhaps most relevant, gifted individuals that are scientifically identified can contribute positively to their society with excellence. People do not really exist until you name them. Gifted adults are a minority group still to be defined and understood. For some, this group accounts for only 2% of the total population while most optimistic researchers increase the prevalence up to 20% (Infante, 2015).

In this line of discourse, the present study aims to explore the state of research in this area through a systematic review and analysis of the literature on *gifted adults*. To date, there have been no studies in this field that have used performance analysis and science mapping to directly address sets of terms shared by articles and reviews. In doing so, the literature is mapped directly from the interaction of key terms. This is the first science mapping analysis in the field of adult giftedness to show

its conceptual structure and literature development, using research performance measurement or bibliometrics. Bibliometrics is the discipline that quantifies the performance of a researcher, a collection of selected articles, a scientific journal or an institute. Ideally, research performance is a broad assessment that takes into account a range of quantitative metrics and combines them with qualitative data. Quantitative metrics are emphasised because they facilitate the comparison, both objectively and globally, of all that is important in an effective bibliometric study. Bibliometric analysis is recognised as a powerful method for describing publishing trends and highlighting relationships between published papers. Using statistics, bibliometrics unravels and displays the cumulative scientific knowledge and evolutionary nuances of subject areas from a large volume of unstructured data. Bibliometric methods can be divided into two categories: evaluative and relational. *Evaluative bibliometrics* are used to describe characteristics of published information such as the evolution of a topic (Ninkov et al., 2022) while *Relational bibliometrics* provide an overview of the relationships between different actors (Stuart, 2014) by examining common metadata occurrences (citations, keywords, authors, etc.). A co-word analysis was carried out using a longitudinal framework. This produced strategic diagrams to categorize the themes identified in relation to giftedness in adults. Furthermore, constructing a map of relationships of giftedness could show us areas that are close to each other and facilitate the creation of new connections between them.

The aim of this study is to explore the themes that have been the focus of research on high abilities in adults throughout history. By examining the literature and conducting a comprehensive bibliometric analysis, we aim to identify the key areas of investigation and understand the evolving trends and patterns in the study of giftedness in the adult population. This exploration will provide valuable insights into the research landscape and shed light on the topics that have garnered significant scholarly attention, as well as uncover potential gaps or emerging areas of interest in the field of adult high abilities.

2. Method and materials

To accomplish our purpose and to reach scientific conclusions, first it was performed an analysis of science mapping for detecting and visualizing conceptual subdomains. Mapping analyses were done with SciMAT an open-source software tool, proposed by Cobo et al. (2012). It has three key features: (1) one module dedicated to the management of the knowledge base and its entities (document, author, affiliation, keyword, reference, author of reference, source of reference, period, etc.), (2) another module responsible for carrying out the science mapping analysis, and (3), a final module to visualize the generated results and maps. SciMAT knowledge includes 16 entities: affiliation, author, author group, author-reference, author-reference group, document, journal, publish date, period, reference, reference group, reference-source, reference-source group, subject-category, word, and word group. A rigorous step-by-step analysis was followed to reach scientific conclusions based on data search, data refinement, standardization and creation of the network, map creation, analysis and visualization, and performance analysis.

Web of Science (WoS) Core Collection was used to run SciMAT analyses. Compared with Scopus (another popular database used for bibliometric purposes), WoS has good coverage of publications (Harzing & Alakangas, 2016) and an extensive reach in social sciences literature (Norris & Oppenheim, 2007). Consequently, appropriate publications linked with the main topic were selected using the following keywords: “gifted” and “adult”, “gifted” and “worker”, “gifted” and “employee”, “talent” and “adult,”

"eminent adult", "high achieving adult", "adult divergent thinking", "adult creative thinking". This advanced search retrieved 661 (review) articles from 1948[1] to 2022. Only English (632) written items were selected for the purpose. Considering WoS categories, 376 results were considered for the next step (Table 1).

Table 1. *Web of Science refined elements.*

Document types (661)	Article	620
	Review article	41
By language (632)	English	632
Web of Science categories (376)	Education Special	128
	Psychology Educational	68
	Education, Educational Research	61
	Psychology Multidisciplinary	57
	Management	20
	Neurosciences, Psychology	19
	Psychology Social	14
	Behavioral sciences	9

Note. Source: own elaboration.

In an attempt to follow the on-going research on adult giftedness, three periods have been considered for the following analyses; (a) from 1948 to 2000; (b) from 2001 to 2011, and (c), from 2012 to 2022.

It can be admitted that consolidation of IQ measures can be dated in 1948 when so-called *Flynn effect* -i.e., continuous increase of IQ in 4.4 points every decade-, forced practitioners to interpret people´s results by using adjusted IQ score ranges (Tuddenham, 1948) The first period ends in 2000, at the advance of the so-called *Era of Neurology* in applied sciences, where neural evidence in the neuropsychology of intelligence was shown that clearly influenced the scientific community's definition of intelligence beyond psychometric properties (Craggs et al., 2006; De Mirandés, 2016; Pickersgill, 2013). Therefore, the concept of human intelligence was redefined in a multidimensional and integrated way so as to include brain-based evidence affecting mind functioning such as emotional intelligence, self-awareness, anxiety or motivation. A paradigmatic shift from the positivist conception of intelligence took place in gifted education from *identification* to *transaction* paradigm (*see* Lo & Porath, 2017). The third period under consideration in the present analysis begins in 2012 and encompass a critical 10-year period to apprehend the impact of the effects of the twenty-first century education of digital generations (*see* Renzulli, 2012).

The data refinement and reduction step are aimed at identifying incorrect, duplicate, or misspelled items and so 376 items were obtained. For the standardization and creation stage, a co-occurrence network standardized through the equivalence index was used. Then, *simple center* algorithms were employed to obtain the science map and its clusters (Coulter et al., 1998). The co-occurrence frequency of two keywords was extracted from document corpora by counting the number of elements where the

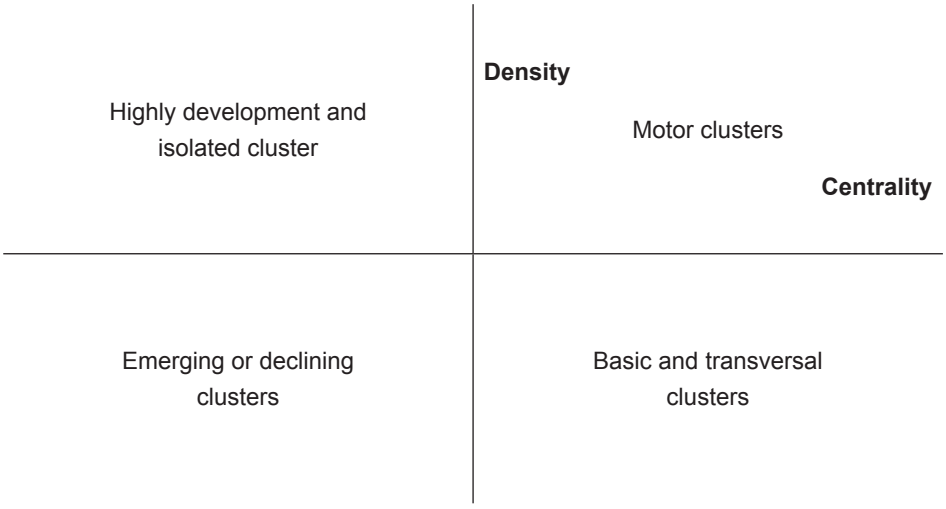
1 The initial year is embedded in the Space Race period between U.S. and former U.S.S.R. and precisely, 1948 is remembered for having sent the first monkey into Space and thus making the dream of reaching the moon for human beings closer. Since then, U.S. federal funding has been targeted to support programmes to develop talent within this competitive scope (Roberts, 1999).

two keywords appear together. This can be used to build co-word networks (Krsul, 1998) associated with research themes using clustering tools. Then, the co-word analysis is based on the computation of the co-occurrence keywords frequencies.

I. Detection and visualization of research topics

To identify research-related themes in each period, the algorithm of simple centers was applied to a normalised network of co-words analysis of all articles and reviews processed by WoS. The grouping process locates networks of keywords that are highly interconnected and that correspond to areas of interest or research problems that are of great interest to researchers. Detected themes are visualized using graphics of strategic diagrams and thematic networks (Cobo et al., 2011). The strategic diagram shows the detected clusters of each period in a two-dimensional space and categorizes them according to measures of density and centrality (Callon et al., 1991). Centrality measures the degree of interaction of a network with other networks and can be seen as a measure of that theme's importance in developing the entire research field analyzed. Density collects the internal strength of the network and represents a measure of the theme's development. Considering both measures, four groups of research themes are derived. First, motor ones (top right) referring to strong centrality and high-density values; second, specialized or peripheral (upper left) depicting well-developed internal ties and unimportant external ties, not relevant to the advancement of the field; third, emerging or disappearing (lower left) identifying both weakly developed and marginal, with low density and centrality; and finally basic or transversal themes (right lower) showing important but not sufficiently developed themes (Figure 1). The volume of the spheres is proportional to the number of documents corresponding to each keyword.

Figure 1. *Strategic diagram of SciMAT (Cobo et al., 2012).*



Note. Source (Cobo et al., 2012).

II. Thematic areas

At this stage, the evolution of the research topic over a series of time periods is first established. It is then analised to identify the main areas of evolution of the archived research, their origins and their interrelationships. This allows us to discover the conceptual, social or intellectual relationships of the field of interest.

III. Temporal or longitudinal analysis – evolution map and overlapping graph

SciMAT can provide the evolution map and the graph of overlapping objects to visualize the major trends in the field, their origins, their interrelationships, the target audience and the evolution of the research. To do this, the inclusion index is used to detect links between research topics in different time periods and, in this way, to identify thematic areas in the research field. In addition, as each theme is associated with a set of documents, each thematic area could also have an associated collection of documents, obtained by combining the documents associated with its set of themes. Thus, the *evolution map* shows the temporal evolution of research topics, and the *overlapping graph* represents the number of associated keywords.

By dividing the raw data into different consecutive periods of years, the evolution of the research field could be analysed in a longitudinal way.

3. Results

The presentation of the results was divided into four categories: general bibliometrics (document production, author production and performance, and the most prolific journals), thematic networks and representation of themes, thematic areas, and temporal or longitudinal analysis – evolution map and overlapping graph.

3.1. General bibliometrics

The most prominent, productive, and highest impact subfields can be established by measuring bibliometric performance indicators such as the number of published documents, number of citations, and h-index (Alonso et al., 2009).

Document production

The first results of this bibliometric analysis show the volume of documents published in the periods studied, the number of citations and the h-index proposed by Hirsch (2005), which measures both the productivity and the impact of citations on publications.

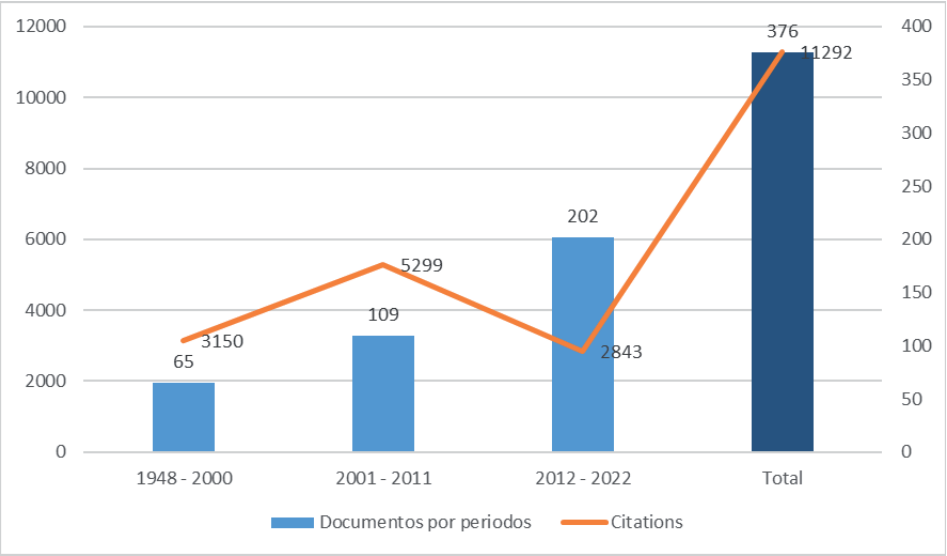
As Table 2 and Figure 2 show, the number of articles in the field has been growing in the last decades. There were found 65 papers for the first period, 109 for the second and 202 for the third. This is not the case for the number of citations, where there is an increase from the first period (3,150) to the second (5,299), but a substantial reduction in the third period (2,843).

Table 2. *Document production per period.*

Periods	Nº Documents	% of total	Nº Citations
1 (1948 – 2000)	65	17.29	3,150
2 (2001 – 2011)	109	28.99	5,299
3 (2012 – 2022)	202	53.72	2,843
All (1948 – 2022)	376	100	11,292

Note. Source: own elaboration.

Figure 2. *Evolution of document production per period.*



Note. Source: own elaboration.

Author´s production and performance

The most prolific authors are shown in Table 3. A total of 904 authors were identified through the following data: number of publications in the area, citations of these documents, total number of citations per author's publications and their h-index.

Table 3. *Production and performance by authors (1948-2022).*

Author	Nº documents	Nº citations	Total citations	Total h-index
Lubinski, D.	10	792	2,272	26
Benbow, C.P.	7	420	6,661	44
Worrell, F.C.	5	450	3,053	27
Vannatter, A.	4	23	23	3
Subotnik, R.F.	4	450	996	14
Olszewski-Kubilius, P.	4	450	1,291	18
Votter, B.	3	27	30	2
Wirthwein, L.	3	62	597	14
Rost, D.H.	3	62	1,001	18
Schnell, T.	3	43	937	15

Note. Source: own elaboration.

According to these figures, 1.1% of the total number of authors encompass 12.2% of total publications in the field of giftedness (and related terms), thus fulfilling Lotka's bibliometric law for his author selection by which there is a tendency towards a bibliometric rate of 20-80 (i.e., 20% of authors yielding 80% of production) (Lotka, 1989). Precisely, four longitudinal studies stand out in Lubinski´s research work referring to the evolution of maths abilities, vocational interests, creative, occupational, and life

accomplishments, and values (Lubinski et al., 1995; Lubinski et al., 1996; Lubinski & Benbow, 2006; Lubinski et al., 2006). In almost a four-decade research periods, Lubinski and his colleague Camilla Benbow – second most prolific author from our list- have proved the power of psychological assessments at age 12 in predicting adult accomplishments and contributions at least in the academic realm and assuming that talents are cultivated. Therefore, our data also indicates that prevalent research is aimed at documenting gifted children becoming gifted adults with few attempts to analyse unidentified adults as gifted themselves (Alshehri, 2020).

The most prolific journals

Table 4 summarizes the most prolific journals related to the area. The analysis identified a total of 184 items with four journals accounting for more than 25% of paper production: Gifted Child Quarterly (36 documents), Roeper Review – A Journal on Gifted Education (34 documents), Journal for the Education of the Gifted (25 documents) and Frontiers in Psychology (18 documents). Despite the variety of journals with publications in the area, just these four journals alone accumulated to one-third of the production.

Table 4. *Most prolific journals.*

Journal	Country	Nº documents	% of total	IF	IF (last 5 years)
Gifted Child Quarterly	USA	36	9.57	2.409	2.982
Roeper Review – A Journal on Gifted Education	GB	34	9.04	0.64	0.61
Journal for the Education of the Gifted	USA	25	6.64	0.61	0.65
Frontiers in Psychology	Switzer-land	18	4.78	4.232	4.426
High Ability Studies	UK	9	2.39	1.563	1.859
Journal of Advanced Academics	USA	9	2.39	0.91	0.97
Journal of Counseling and Development	USA	7	1.86	2.455	3.152
Personality and Individual Differences	UK	6	1.59	3.95	4.276
Psychology of Sport and Exercise	Nether-lands	6	1.59	5.118	5.147
International Journal of Sports Science & Coaching	UK	6	1.59	2.029	2.294

Note. Source: own elaboration.

3.2. Thematic networks and themes representation

The cluster information identified for the whole network and for the performance over the whole period (1948-2022) is presented in the tables below. Specifically, as Table 5 shows, the networks more connected with giftedness (centrality) are *students (84.49), disorders (79.17) and intelligence* (67.05) and the least connected are *eudaimonia* (4.23), *gifted adults* (5.65), and *high-IQ* (7.54). The most developed themes with internal network strength (density) are *disorders* (37.16), *stress* (33.33), and *high-IQ* (26.67) and the less developed are *performance* (3.66), *gender* (6.27), and *validity* (6.41).

Table 5. *Performance measures (1948-2022).*

Name	Centrality	Density	Document count	Docu-menth-Index	Document citations
Disorders	79.17	37.16	35	13	844
Sport	45.37	21.54	61	19	2,566
Counseling-psychology	34.09	22.87	60	22	2,879
Students	84.49	10.09	127	22	1,984
Children	66.13	10.72	107	28	3,063
Experiences	52.31	9.69	53	19	1,534
Intelligence	67.05	24.02	60	19	1,301
Motivation	38.57	15.5	48	15	1,580
Performance	46.66	3.66	77	22	1,944
Gender	41.8	6.27	61	19	1,068
Development	54.89	11.83	46	16	2,027
Gifted-adults	5.65	11.84	25	8	206
Stress	24.14	33.33	14	5	152
Autism	16.91	10.79	25	11	770
Validity	26.57	6.41	24	11	220
High-IQ	7.54	26.67	8	8	122
Eudaimonia	4.23	16.67	11	6	1,252
Psychological-Characteristics	10.64	14.44	11	8	250

Note. Source: own elaboration.

On the other hand, most of the documents published during the whore study period are about students (127 document, h-Index of 22 and 1.984 citations), children (107 documents, h-Index of 28 and 3.063 citations), and by far, about performance (77 documents, h-Index of 22 and 1.944 citations).

Table 6 shows the information regarding the most relevant documents found in the studied area, according to the number of citations. Within subareas of giftedness, papers refer to studies on *ability, well-being, clinical neuropsychology, gifted education,* and *personality.*

Table 6. *Most cited documents (1948-2022).*

Document title	Authors	Year	Journal	Nº Citations
Varieties of numerical abilities	Dehaene, S.	1992	Cognition	1,227
Psychological Well-Being Revisited: Advances in the Science and Practice of Eudaimonia	Ryff, C.D.	2014	Psychotherapy and Psychosomatics	911

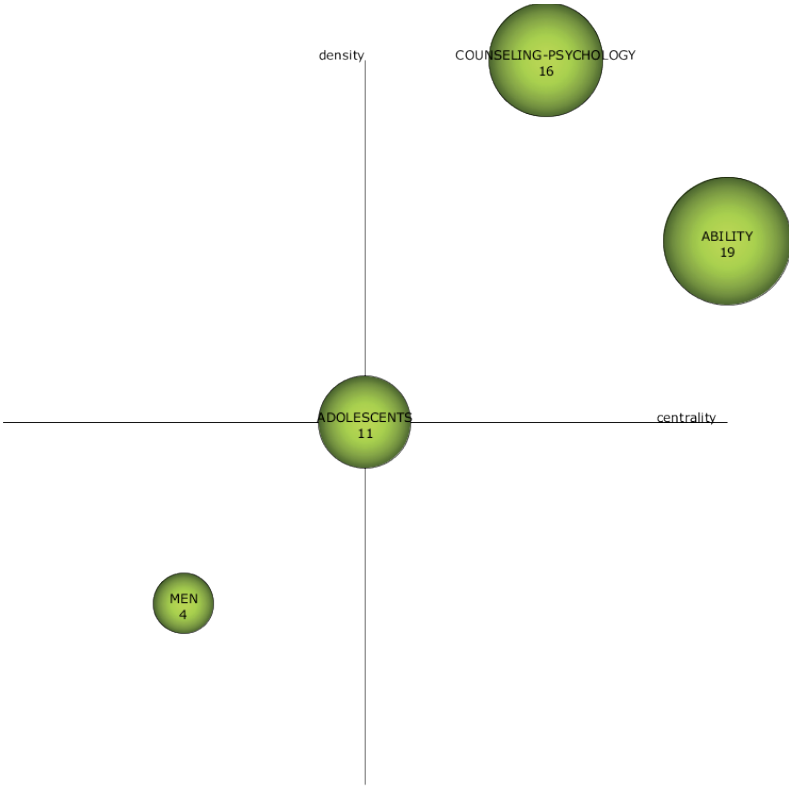
Adolescent cortical development: A critical period of vulnerability for addiction	Crews, F., He, J., & Hodge, C.	2007	Pharmacology Biochemistry and Behavior	676
Rethinking Giftedness and Gifted Education: A Proposed Direction Forward Based on Psychological Science	Subotnik, R.F., Olszewski-Kubilius, P., & Worrell, F.C.	2011	Psychological Science in the Public Interest	419
Personality trait development from age 12 to age 18: Longitudinal, cross-sectional, and cross-cultural analyses.	McCrae, R.R., Costa, P.T., Terracciano, A., Parker, W.D., Mills, C.J., De Fruyt, F. & Mervielde, I.	2002	Journal of Personality and Social Psychology	263

Note. Source: own elaboration

First period analysis: 1948-2000

During this period, four pivotal themes were identified: two motor ones (*counseling-psychology* and *ability)*, one right in the center of the diagram (*adolescents*) and the last one, *men*, which could act as either an emerging or declining theme within the research field (Figure 3). Sphere size is proportional to the number of published documents linked to each research theme.

Figure 3. *Strategic diagram by document counts during first period (1948 – 2000).*



Note. Source: own elaboration using SciMAT software.

According to performance measures (Table 7), it was found that *men* is the less relevant theme during this period with only four documents, 78 citations and an h-index of 4. On the other hand, *adolescents'* studies account for 11 documents (366 citations; h-index = 8) and *counselling-psychology* some up to 16 documents (812 citations; h-index = 14).

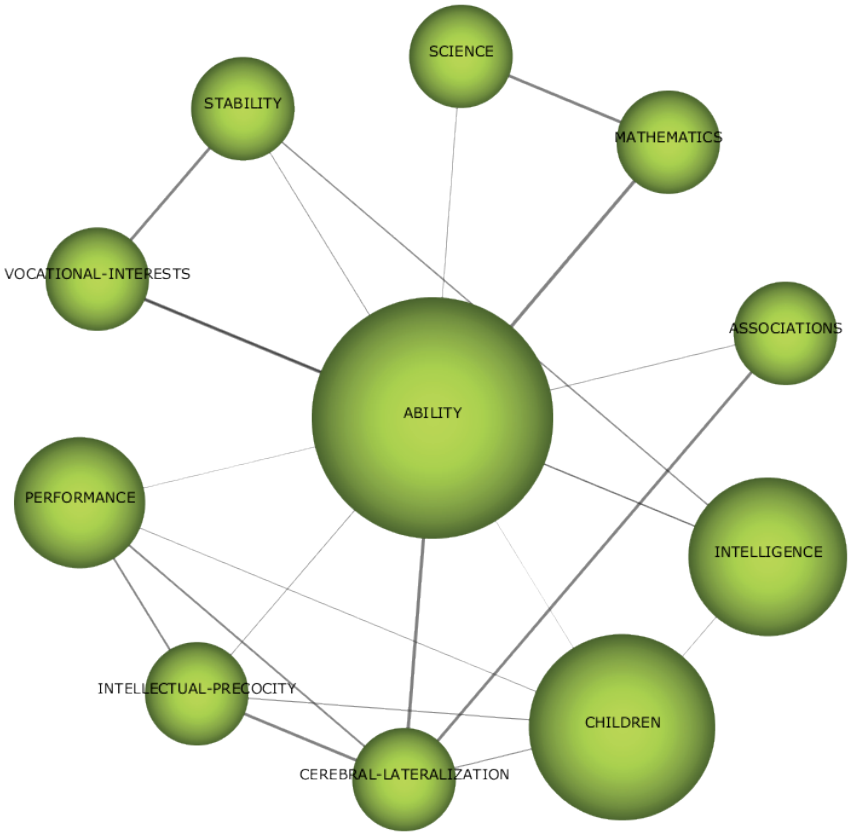
Table 7. Performance measures during the first period (1948-2000).

Name	Centrality	Density	Document count	Document h-Index	Document citations
Ability	64.99	28.68	19	16	1,126
Counseling Psychology	47.14	100.59	16	14	812
Adolescents	31.33	17.5	11	8	366
Men	17.5	16.67	4	4	78

Note. Source: own elaboration

Finally, *ability* as a motor theme (well developed and important for discipline) achieved the largest number of documents (19), citations (1,126), and the highest impact (h-index = 16), which represents research conducted mainly on *children*, *intelligence* and *performance* (Figure 4).

Figure 4. *Ability Cluster's network for the first period (1948 – 2000).*

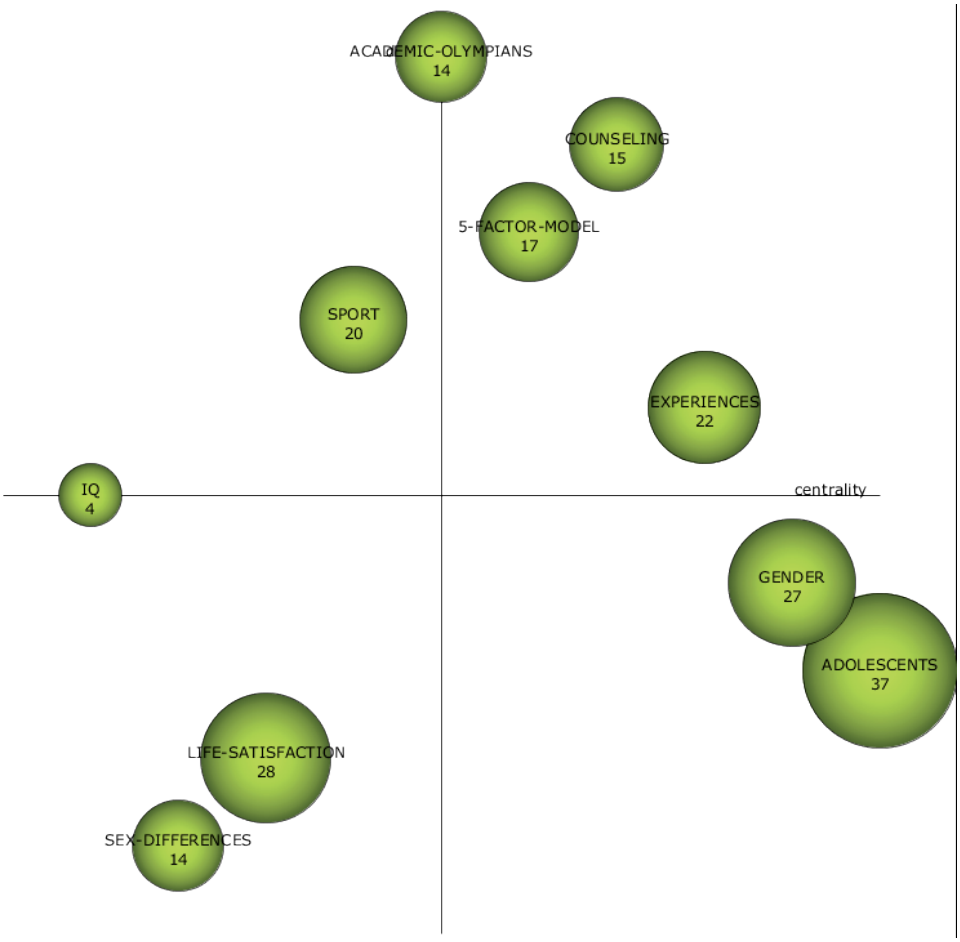


Note. Source: own elaboration using SciMAT software.

Second period analysis: 2001-2011

Figure 5 shows ten relevant themes during the second period as follows: four motor ones (*experience*, *5-Factor model*, *counselling* and *Academic Olympians*), two basic and transversal themes (*adolescents* and *gender*), two emerging ones (*life-satisfaction* and *sex-differences*), and two highly developed or isolated themes (*sports* and *IQ*).

Figure 5. *Strategic diagram by document count during the second period (2001 – 2011).*



Note. Source: own elaboration using SciMAT software

According to performance measures (Table 8), themes that stand out for number of documents are *adolescents* (37), *life-satisfaction* (28) and *gender* (27). Considering the h-index, the order changes to *adolescents* (18), *sport* (17) and *experiences* (16). Paying attention to citations, the three themes with a higher impact were *experiences* (2,120), *sport* (1,749) and *counseling* (1,579).

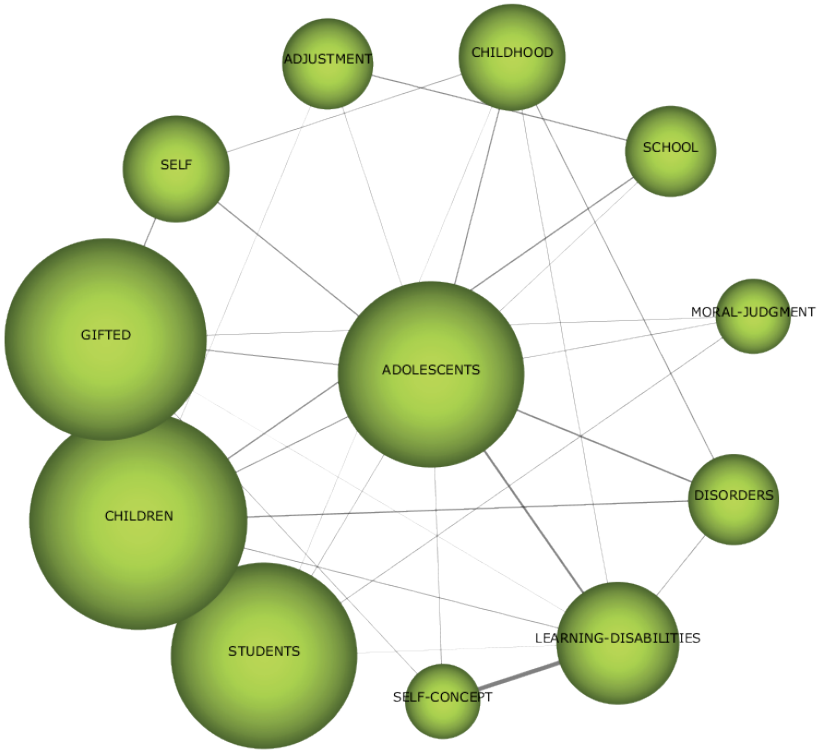
Table 8. *Performance measures during the second period (2001-2011).*

Name	Centrality	Density	Documents count	Documents h-Index	Documents citations
Experiences	130.29	33.91	22	16	2,120
Sport	84.01	47.16	20	17	1,749
Counseling	113.74	70.49	15	11	1,579
Adolescents	143.49	20.79	37	18	1,427
Gender	137.27	23.2	27	15	1,137
Academic-Olympians	85.9	147.59	14	11	793
Sex-differences	61.3	6.8	14	11	792
5-Factor Model	92.8	60.65	17	11	729
IQ	27.21	27.78	4	4	602
Life satisfaction	72.51	20.72	28	13	593

Note. Source: own elaboration

Figure 6 shows the corresponding cluster network for the *adolescent's* theme. It seems mainly related to *children*, *students* and *gifted* and for the first time *gifted* and *adolescents* appear as related themes.

Figure 6. *Adolescents Cluster's network for the second period (2000 – 2011).*

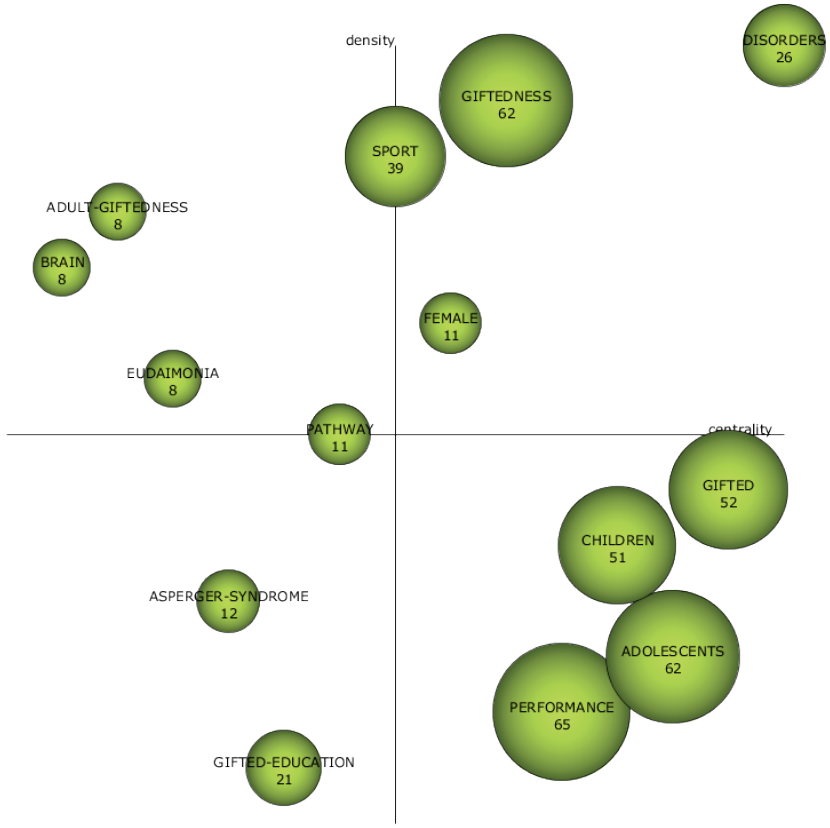


Note. Source: own elaboration using SciMAT software.

Third period analysis: 2012-2022

During this period (Figure 7), 15 themes were identified as follows: four motors ones (*giftedness, sport, disorders, female*), four basic and transversal (*performance*, *adolescents*, *gifted* and *children*), three emerging or declining (*gifted education, Asperger syndrome* and *pathway*) and four specialized or isolated (*agency*, *eudaimonia*, *brain*, and *adult giftedness*).

Figure 7. *Strategic diagram by document count during the third period (2012 – 2022).*



Note. Source: own elaboration using SciMAT software

According to performance measures (Table 9) the most prolific themes for this period were *performance* (65), *giftedness* (62), a*dolescents* (62), and *gifted* (52). Related to the highest h-index, results were similar: *performance* (16), *giftedness* (15), *adolescents* (15), *children* (15) and *gifted* (12). Regarding citations, the most relevant topics were *performance* (1,674), followed by *giftedness* (1,454) and far from them *eudaimonia* (1,121).

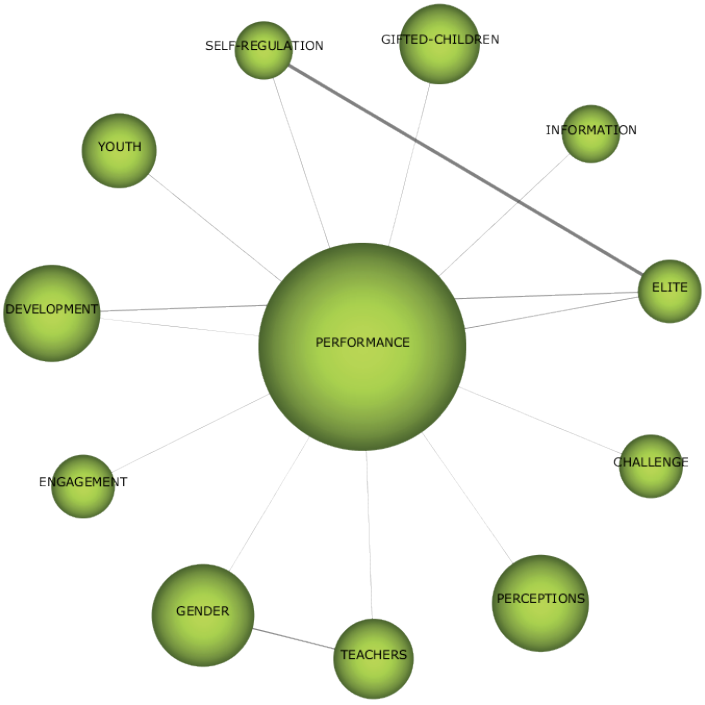
Table 9. *Performance measures during the third period (2012 – 2022).*

Name	Centrality	Density	Documents count	Documents h-Index	Documents citations
Performance	56.08	8.36	65	16	1,674
Giftedness	51.25	35.93	62	15	1,454
Eudaimonia	2.67	20	8	4	1,121
Children	57.43	17.73	51	15	766
Adolescents	64.31	9.96	62	15	569
Gifted	73.55	18.1	52	12	418
Sport	29.36	30.01	39	10	374
Gifted education	10.42	7.58	21	8	260
Brain	0	22.22	8	6	257
Disorders	81.07	57.07	26	11	252
Pathway	14.38	18.15	11	6	168
Asperger-Syndrome	5.55	12.47	12	8	130
Female	31.15	20.83	11	4	29
Adult-Giftedness	1.91	26.67	8	3	18

Note. Source: own elaboration.

The cluster network for *performance* represents research conducted during this period, especially on *development*, *gender*, *perceptions*, and *gifted children* (Figure 8).

Figure 8. *Performance Cluster's network for the third period (2012 – 2022).*



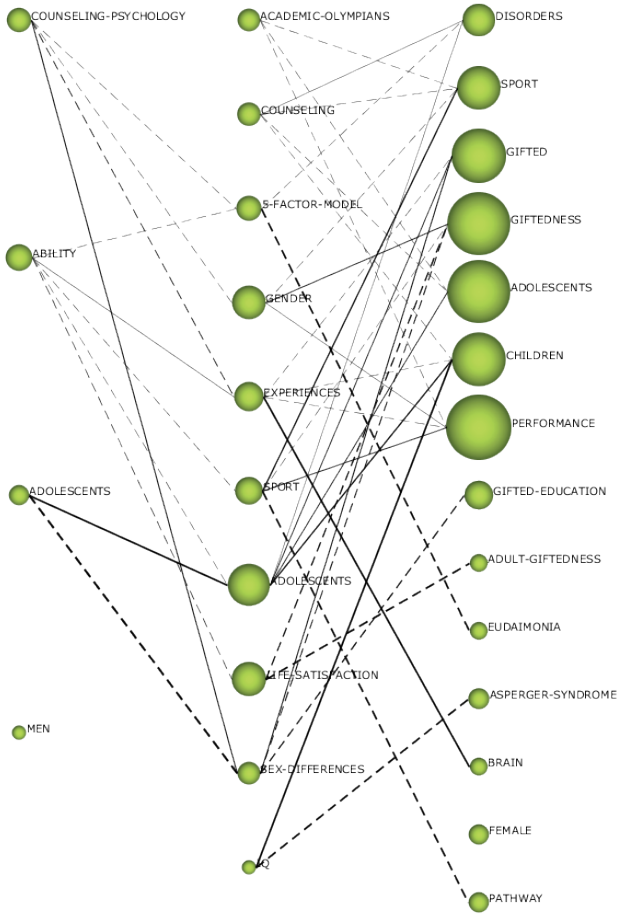
Note. Source: own elaboration using SciMAT software.

3.3. Thematic areas

The following figures display the evolution maps according to number of documents (Figure 9), number of citations (Figure 10) and h-Index (Figure 11). Vertical lines are used to divide the time periods. The spheres show the most relevant themes of each period, and their size is relative to the number of documents associated with the theme. When the lines between clusters are continuous, it means they share the most significant elements or the main element of the topic. Discontinuous or dotted lines indicate that themes share some elements, but not the main one. The thicker the line, the higher the inclusion index.

Relations between periods and themes/keywords.

Figure 9. *Thematic evolution. Structural analysis.*



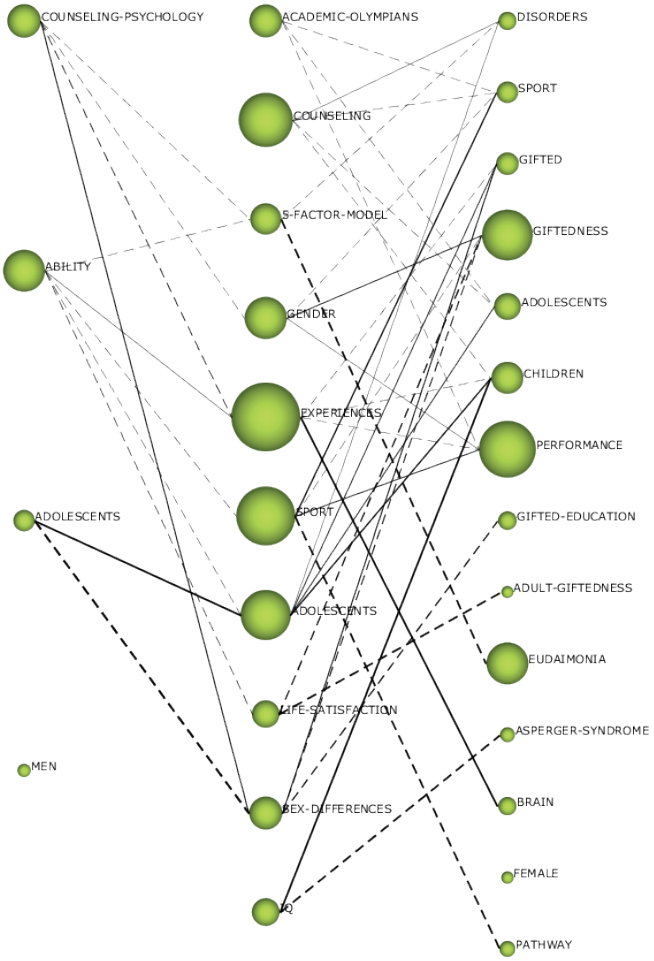
Note. Source: own elaboration using SciMAT software.

The in-between period appears to be the most important in number of citations whose contents on *experiences, sports,* and *adolescents* were connected primarily with research topics on performance, *brain, sports,* and *children* respectively, in the third period.

In this first thematic evolution, there seems to be at least six longitudinal thematic associations between papers in relation to the number of documents. Consequently, initial papers on *ability* studies seem to be significantly connected with papers on

experiences, and later on with *brain* studies. To a lesser extent, *ability* studies are connected to *sport* whose production has been reinforced in the last period, and to *personality* papers (i.e., 5-factor model) that seem to be associated with *well-being* (i.e., eudaimonia[2]) studies in the last decade. Paradoxically, within the area of giftedness, *ability* papers are not linked to a yielding production of *IQ* studies on children. On the other hand, papers on general issues on *adolescents* within gifted terms has evolved as a strong thematic area nowadays linked to papers on *children*. Initial papers of *counseling* seem to have progressed in the second period towards a connection with *disorder* studies on the last period. Interestingly, *men* and *female* studies on the issue are isolated topics in the first and last period, respectively. To be precise, *adult giftedness* papers only appear in the last decade reinforced by studies on *life-satisfaction* – in the second period - and, to a lesser extent, with *ability* studies during the 20th Century.

Figure 10. *Thematic evolution. Performance analysis by citations.*

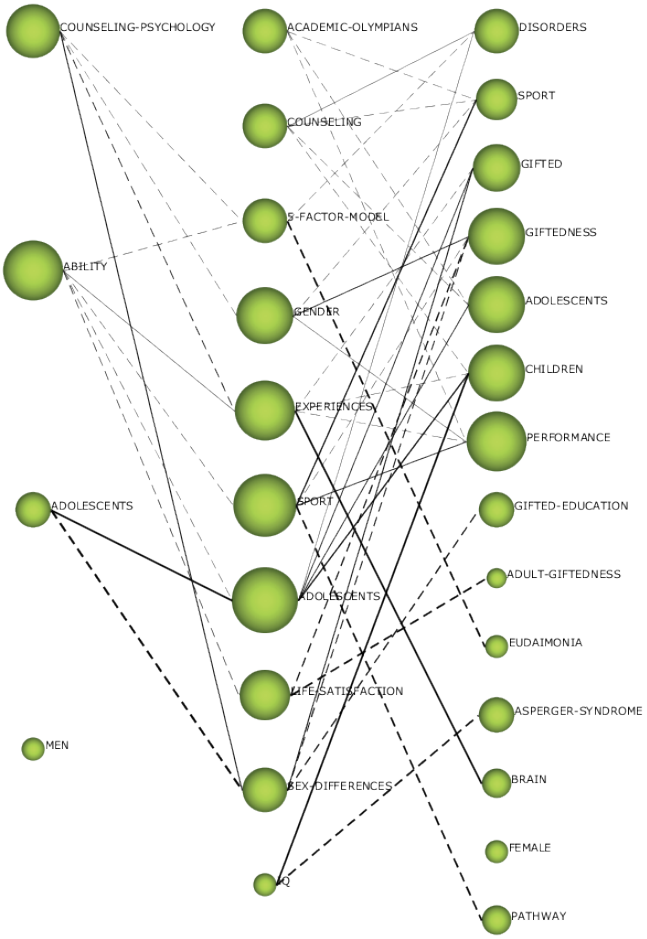


Note. Source: own elaboration using SciMAT software.

2 In Aristotelian ethics, eudaimonia is the condition of human flourishing or of well-being. The conventional translation that refers to "happiness" is inadequate because eudaimonia does not consist of a positive state of mind or a pleasant feeling. Instead, eudaimonia is the highest human feeling of satisfaction due to a state of being in the right place in one´s life.

Expressed by citation statistics, relationships between the three periods are weaker. While previous links are confirmed, it appears that *sex-differences* studies have been pivotal to connect past studies on both *adolescents* and *counseling* with general studies on *gifted education/gifted/giftedness.* There is also a strong isolated connection between *IQ* studies and papers on *children* of two different research decades. There were found the same thematic evolutions using an H-index analysis (Figure 11).

Figure 11. *Thematic evolution. Performance analysis by h-index.*



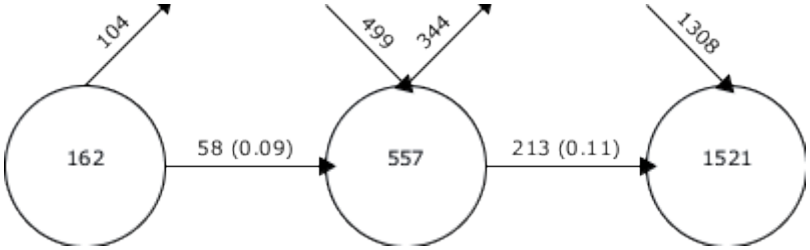
Note. Source: own elaboration using SciMAT software.

3.4. Temporal or longitudinal analysis – evolution map and overlapping graph

The evolution of keywords is represented by the overlapping map (Figure 12). The circles represent each period and within them the total number of keywords for that period. The horizontal arrows between periods correspond to the number of shared words, which means words that continue to be used in the subsequent period. The similarity or overlap index is shown in parentheses. The outgoing diagonal arrows represent the number of words that have no temporal continuation

in the following period. The incoming diagonal arrows show the number of new words in the period.

Figure 12. *Overlapping map.*



Note. Source: own elaboration using SciMAT software.

In this case, the data shows that the keywords in the area are increasing in the last decades. The first period is comprised of 162 keywords with 104 of them not remaining in the second period, and only 58 were shared through the next. These 58 keywords from the first period and 499 genuine keywords from the second resulted in a total of 557 keywords for the second period, of which 344 did not persist in the next period. The third period received 213 keywords from the second one and presented 1,308 new keywords, resulting in a total of 1,521 keywords. To conclude, Table 10 shows a resume with the most relevant findings from the bibliometric analysis according to temporal periods.

Table 10. *Summary of general and specific development of adult giftedness theme within the periods.*

	Period 1 (1948-2000)	Period 2 (2001-2011)	Period 3 (2012-2022)
Nº themes	4	10	14
Most relevant themes	Ability	Adolescents	Performance
Nº of themes clusters	10	11	11
Secondary themes	Counselling Adolescents Men	Life-satisfaction Gender Experiences	Giftedness Adolescents
Developed	No	No	Yes, but isolated
Thematic connections	Ability	Life-satisfaction	Qualitative methodology

Note. Source: own elaboration.

4. Discussion

The present study was aimed to describe literature on adult giftedness using SciMAT software. General metrics, performance measures, and longitudinal thematic analyses were consequently conducted by introducing significant descriptors and three specific periods on the issue. As anticipated in literature (Alshehri, 2020; Brown & Peterson, 2022; Perrone et al., 2007), little results were obtained to label a solid-based research theme on adult giftedness at present times.

According to our data analyses, the evolution of giftedness literature has increased both in number of sound topics (themes) and network items (clusters). As depicted in

Table 10, the most relevant theme referred to *ability studies* during the 20th century (first period) that enabled the production of diverse subthemes within giftedness such as papers on *intelligence, performance*, and (*gifted*) *children*.

Papers on (gifted) *adolescents* seem to have been prolific during the first decade of the new Century (second period) and beyond. However, three additional themes that expanded gifted literature were so introduced; (1) studies on *experiences,* that evolved studies of the *brain* probably connected with the advance of neurosciences, and consequently, of a neuropsychology of giftedness (De Mirandés, 2016; Descheemaeker et al, 2005; Pickersgill, 2013), (2) papers on *life-satisfaction,* later linked to the onset of timid *adult gifted* area of research in the third period, and (3), *gender papers,* that have had a transversal role on general studies on *giftedness* because they do not have specific links to concrete themes at present.

Data from the three analyses did confirm that *academic Olympiads* studies are connected to both papers on *adolescent, performance* and *sport,* as early anticipated. Despite delimiting our bibliometric analysis to focus on adults, the relationship between the discovered topics reveals a substantial body of research that has been conducted in children and adolescents. This indicates a significant amount of scholarly interest and investigation in understanding the developmental aspects and educational needs of younger populations.

Consequently, *adult gifted* is an emerging study area in giftedness that has started with a timid development only a decade ago with the support of studies on life-satisfaction and earlier papers on ability. Notably, the interest in giftedness in adults does not seem to come exclusively from cognitive testing (i.e., intelligence studies) or performance research, but also and more recently by studies focusing on life-span issues (such as *life satisfaction*) and *qualitative methodologies*. No doubt that today's expanded definition of giftedness beyond quantitative, cognitive criteria – i.e., IQ measurements - that once characterised first longitudinal studies of the realm (Terman, 1925, Frey & Detterman, 2004)-, has been influenced by the inclusion of these new themes. In this sense, present factors for giftedness assessment include personality (Hébert, 2019; Piechowski, 2017), performance, general satisfaction (e.g., Perrone et al., 2012), development (Kaufmann & Matthews, 2012), perception (e.g., Mun & Hertzog, 2019), and gender, which suit a complex and more realistic evaluation of both (gifted) children and adults (Brown & Peterson, 2022; Brown et al., 2020). In addition, the data retrieved has proved that giftedness studies during the last Century used children as subjects inside educational settings while later moving interests to attend adolescents and adults in various scenarios (Schlegler, 2022) and methodologies in the last two decades.

These results seem to suggest that the *giftedness* area of study is in full development and currently supported by a diversity of topics and relationships between terms in different periods. However, while the shown trends suggest that the number of keywords and themes will continue to increase in the future, *adult giftedness* is not a major issue of concern at present. As denounced by Alshehri (2020) in his recent review of the literature, gifted adults remain a relatively untested group in the field of research. Many social issues and concerns about adult giftedness that are not being debated have not been captured or linked in our analysis. Issues such as impostor syndrome, ethical values, job hopping, personality traits, competence assessment, work-life satisfaction, mental health and others, are poorly known and understood in gifted adults. Therefore, our work support voices that claim further research on giftedness with adult subjects considering the rich evolution of giftedness in the past.

Studies on giftedness cannot stop in the stage of adulthood pretending to admit that all has been said and done during early stages. Gifted adults should not be abandoned to their fate because they need special care and attention, different from ordinary people. The research community has the duty to increase our knowledge on how gifted adults can better adapt themselves to the demands of development at universities and/or companies, how can they cope with uncomprehensive values and unfair hidden norms that modern societies seem to promote, or how they can overcome discrimination and mobbing situations. The advance in this area will help us to save and develop the talent of the most valued citizens of our society.

Our bibliometric study has some methodological limitations due to the subjectively in the definition of exclusion criteria (type of document, research area, language). Consequentially, different inclusion and exclusion criteria could lead to a more thorough review of the field. In addition, there are authors who do not mention all relevant keywords, or there may be some bias in the selected keywords. The results found in our analysis may be influenced by variables that have not been taken into account, such as cultural differences between countries. Therefore, further research is necessary to shed light on the role of these and other variables. Conducting additional investigations could provide valuable insights into how cultural factors and other unexplored variables may impact the outcomes and help us better understand their implications.

This study has retrieved articles and reviews from the WoS and thus, it restricts the research to the approach of the documents included in this database. Moreover, the document selection was grounded on certain WoS descriptors and subsequent SciMAT categories. In that sense, some research could be included in other categories (Martínez et al., 2015). Although it is a complete and powerful science mapping tool, SciMAT can only calculate two network measures (centrality and density) whereas other software tools allow more network measures (i.e., Science of Science Tool) (Callon et al., 1991). However, a strong point of SciMAT is the possibility of refining the keywords to obtain more accurate results.

5. Conclusions

The presented bibliometric study reveals that research on high abilities has predominantly focused on childhood and adolescence. However, a promising trend is emerging with a growing emphasis on investigating high abilities in adults. This shift in attention indicates a recognition of the lifelong significance of giftedness and the need to explore the unique characteristics and developmental trajectories of gifted individuals as they mature. As researchers increasingly turn their focus to understanding high abilities in adulthood, it is anticipated that new insights and perspectives will emerge, contributing to a more comprehensive understanding of giftedness across the lifespan.

Research on high abilities in adults is of paramount importance due to several reasons. Firstly, it helps us understand the lifelong trajectory of gifted individuals and how their abilities may evolve over time. This knowledge is crucial for tailoring appropriate educational and career development strategies that can fully harness their potential. Secondly, studying high abilities in adults allows us to identify the factors that contribute to their continued success and well-being, leading to insights on how to support and nurture gifted individuals in various domains. Additionally, research in this area can also shed light on the underrepresentation of gifted adults

in certain fields or professions, offering opportunities to address barriers and promote diversity and inclusion. Ultimately, by investigating high abilities in adults, we can gain a comprehensive understanding of their impact on society and explore ways to foster a more supportive and equitable environment for individuals with exceptional talents.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

This investigation has not received any specific aid from public agencies, the commercial sector, or non-profit entities.

Contribution

These authors have contributed equally to this work.

References

Alonso, S., Cabrerizo, F., Herrera-Viedma, E., & Herrera, F. (2009). H-index: A review focused on its variants, computation and standardization for different scientific fields. *Journal of Informetrics, 3*(4), 273–289. https://doi.org/10.1016/j.joi.2009.04.001.

Alshehri, R. M. (2020). Gifted Adults Career as a Reflection of Gifted Education: A Systematic Review of the Literature. II IOSR *Journal of Research & Method in Education (IOSR-JRME), 10(2),* 38-45.

Angela, F. R., & Caterina, B. (2022). Creativity, emotional intelligence, and coping style in intellectually gifted adults. *Current Psychology, 41*, 1191–1197. https://doi.org/10.1007/s12144-020-00651-1.

Bazler, J. A., Graybill, L., & Sickle, M. L. (2015). Historical Overview of Adult Gifted Education in the United States. In Lennex, L., & Nettleton, K. F. (Eds.). *Cases on Instructional Technology in Gifted and Talented Education* (pp 1-10). IGI Global. https://10.4018/978-1-5225-0034-6.ch001.

Bravata, D. M., Watts, S. A., Keefer, A. L., Madhusudhan, D. K., Taylor, K. T., Clark, D. M., Nelson, R. S., Cokley, K. O., & Hagg, H. K. (2019). Prevalence, predictors, and treatment of impostor syndrome: A systematic review. *Journal of General Internal Medicine, 35(4*), 1252-1275. https://doi.org/10.1007/s11606-019-05364-1.

Brown, M., & Peterson, E. (2022). Current approaches to research with gifted adults: differences known and unknown. *Roeper Review 44*(1), 6-18. https://doi.org/10.1080/02783193.2021.2005207.

Brown, M., Peterson, E.R., & Rawlinson, C. (2020). Research with Gifted Adults: What International Experts Think Needs to Happen to Move the Field Forward, *Roeper Review, 42*(2), 95-108. https://doi.org/10.1080/02783193.2020.1728797.

Kabalina, V., & Osipova, A. (2022). Identifying and assessing talent potential for future needs of a company, *Journal of Management Development*, *41*(3), 147-162. https://doi.org/10.1108/JMD-11-2021-0319.

Callon, M., Courtial, J. P., & Laville, F. (1991). Co-word analysis as a tool for describing the network of interactions between basic and technological research: The case of polymer chemistry. *Scientometrics, 22*(1), 155-205. https://doi.org/10.1007/BF02019280.

Clance, P. R. (1985). *The impostor phenomenon: Overcoming the fear that haunts your success.* Peachtree.

Clance, P. R., & Imes, S. A. (1978). The imposter phenomenon in high achieving women: Dynamics and therapeutic intervention. *Psychotherapy: Theory, Research & Practice, 15*(3), 241–247. https://doi.org/10.1037/h0086006.

Craggs, J. G., Sanchez, J., Kibby, M. Y., Gilger, J. W., & Hynd, G. W. (2006). Brain morphology and neuropsychological profiles in a family displaying dyslexia and superior nonverbal intelligence, *Cortex, 42*(8), 1107-1118. https://doi.org/10.1016/S0010-9452(08)70222-3.

Crews, F., He, J., & Hodge, C. (2007). Adolescent cortical development: A critical period of vulnerability for addiction. *Pharmacology Biochemistry and Behavior, 86*(2). https://doi.org/10.1016/j.pbb.2006.12.001

Cobo, M. J., López-Herrera, A. G., Herrera-Viedma, E., & Herrera, F. (2011). An approach for detecting, quantifying, and visualizing the evolution of a research field: A practical application to the fuzzy sets' theory field. *Journal of Informetrics, 5*(1), 146-166. https://doi.org/10.1016/J.JOI.2010.10.002.

Cobo, M., López-Herrera, A. G., Herrera-Viedma, E., & Herrera, F. (2012). SciMAT: A new science mapping analysis software tool. *Journal of the American Society for Information Science and Technology, 63*, 1609–1630. https://doi.org/10.1002/asi.22688.

Coulter, N., Monarch, I., & Konda, S. (1998). Software engineering as seen through its research literature: A study in co-word analysis. *Journal of the American Society for Information Science, 49*(13), 1206-1223. https://doi.org/10.1002/(SICI)1097-4571(1998)49:13<1206::AID-ASI7>3.0.CO;2-F.

Dehaene, S. (1992). Varieties of numerical abilities. *Cognition*, 44(1–2). https://doi.org/10.1016/0010-0277(92)90049-N

De Mirandés, J. (2016). Convenio internacional de los derechos de las personas con discapacidad. *Neurodesarrollo y Educación*. Meeting organized by UNED. Barbastro, Spain. (International Convention on the Rights of Persons with Disabilities. *Neurodevelopment and Education*. Meeting organized by UNED. Barbastro, Spain.

Descheemaeker, M. J., Ghesquière, P., Symons, H., Fryns, J. P., & Legius, E. (2005). Behavioural, academic, and neuropsychological profile of normally gifted neurofibromatosis type 1 children. *Journal of intellectual disability research, 49*(1), 33–46. https://doi.org/10.1111/j.1365-2788.2005.00660.x.

Fiedler, E. D. (2015). *Bright adults: Uniqueness and belonging across the lifespan*. Tucson, AZ: Great Potential Press.

Frey, M. C., & Detterman, D. K. (2004). Scholastic Assessment or G? The relationship between the Scholastic Assessment Test and general cognitive ability. *Psychological science*, *15*(6), 373–378. https://doi.org/10.1111/j.0956-7976.2004.00687.x.

Harzing, A. W., & Alakangas, S. (2016). Google Scholar, Scopus and the Web of Science: a longitudinal and cross-disciplinary comparison, *Scientometrics, 106* (2),787–804. https://doi.org/10.1007/s11192-015-1798-9.

Hébert, T. P. (2019). A Longitudinal Case Study of Exceptional Leadership Talent. *Gifted Child Quarterly*, *63*(1), 22-35. https://doi.org/10.1177/0016986218800068.

Hirsch, J. E. (2005). An index to quantify an individual's scientific research output. *Proceedings of the National Academy of Sciences (PNAS), 102* (46), 16569-16572. https://doi.org/10.1073/pnas.0507655102.

Infante, E. (2015). *Manual SHINING de atención a las altas capacidades intelectuales.* Granada: Aconcagua. (*SHINING* handbook to high abilities management. Granada: Aconcagua.)

Kaufmann, F. A., & Matthews, D. J. (2012). On Becoming Themselves: The 1964-1968 Presidential Scholars 40 Years Later. R*oeper Review, 34*(2), 83-93. https://doi.org/10.1080/02783193.2012.660682.

Krsul, I. (1998). Software vulnerability analysis (PhD thesis, Purdue University). Retrieved from https://www.cerias.purdue.edu/assets/pdf/bibtex_archive/98-09.pdf.

Lo, O., & Porath, M. (2017). Paradigm Shifts in Gifted Education: An Examination Vis-à-Vis Its Historical Situatedness and Pedagogical Sensibilities. *Gifted Child Quarterly. 61.* https://dou.org/10.1177/0016986217722840.

Lotka, A. J. (1989). Lotka on Population Study, Ecology, and Evolution. *Population and Development Review, 15*(3), 539–550. https://doi.org/10.2307/1972445.

Lubinski, D., & Benbow, C. P. (2006). Study of mathematically precocious youth after 35 years: Uncovering antecedents for the development of math-science expertise. *Perspectives on Psychological Science, 1,* 316-345. https://doi.org/10.1111/j.1745-6916.2006.00019.x.

Lubinski, D., Benbow, C. P., Webb, R. M., & Bleske-Rechek, A. (2006). Tracking exceptional human capital over two decades. *Psychological Science, 17,* 194-199. https://doi.org/10.1111/j.1467-9280.2006.01685.x.

Lubinski, D., Schmidt, D. B., & Benbow, C. P. (1996). A 20-year stability analysis of the Study of Values for intellectually gifted individuals from adolescence to adulthood. *Journal of Applied Psychology, 81,* 443-451. https://doi.org/10.1037/0021-9010.81.4.443.

Lubinski, D., Benbow, C. P., & Ryan, J. (1995). Stability of vocational interests among the intellectually gifted from adolescent to adulthood: A 15-year longitudinal study. *Journal of Applied Psychology, 80,* 196-200. doi:10.1037/0021-9010.80.1.196.

Martínez, M. A., Cobo, M. J., Herrera, M., & Herrera-Viedma, E. (2015). Analyzing the Scientific Evolution of Social Work Using Science Mapping. *Research on Social Work Practice*, *25*(2), 257–277. https://doi.org/10.1177/1049731514522101.

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.

Mun, R. U., & Hertzog, N. B. (2019). The Influence of Parental and Self-Expectations on Asian American Women Who Entered College Early. *Gifted Child Quarterly*, *63*(2), 120–140. https://doi.org/10.1177/0016986218823559.

Ninkov, A., Frank, J. R., & Maggio, L. A. (2022). Bibliometrics: Methods for studying academic publishing. *Perspectives on Medical Education, 11*(3). 173–176. https://doi.org/10.1007/s40037-021-00695-4.

Norris, M., & Oppenheim, C. (2007). Comparing alternatives to the Web of Science for coverage of the social sciences' literature. *Journal of Informetrics, 1*(2), 161-169. https://doi.org/10.1016/J.JOI.2006.12.001.

Perrone, K. M., Boo, J. N., & Vannatter, A. (2012). Marital and Life Satisfaction Among Gifted Adults, R*oeper Review, 34(*1), 46-52. https://doi.org/10.1080/02783193.2012.627552.

Perrone, K.M., Ksiazak, T.M., Wright, S.L., Vannatter, A., Crane, A.L., & Tanney, A. (2010a). Multigenerational Giftedness: Perceptions of Giftedness across Three Generations. *Journal for the Education of the Gifted, 33*(4), 606–627. https://doi.org/10.1177/016235321003300407.

Perrone, K. M., Tschopp, M., Snyder, E., Boo, J., & Hyatt, C. (2010b). A Longitudinal Examination of Career Expectations and Outcomes of Academically Talented Students 10 and 20 Years Post—High School Graduation. *Journal of Career Development, 36*. 291-309. https://doi.org/10.1177/0894845309359347.

Perrone, K. M., Perrone, P. A., Ksiazak, T. M., Wright, S. L., & Jackson, Z. V. (2007). Self-perception of gifts and talents among adults in a longitudinal study of academically talented high-school graduates, *Roeper Review, 29*(4), 259-264. https://doi.org/10.1080/02783190709554420.

Piechowski, M. M. (2017). Rethinking Dabrowski's Theory II: it's not all flat here. *Roeper Review 39*(2), 87-95. https://doi.org/10.1080/02783193.2017.1289487.

Pickersgill M. (2013). The social life of the brain: Neuroscience in society. *Current Sociology, 61*(3):322-340. https://doi.org/10.1177/0011392113476464.

Rayo Lombardo, J. (2015). Identificación y valoración. In E. Infante (Coord). *Manual SHINING de atención a las altas capacidades intelectuales,* (pp. 115-152). Granada: Aconcagua (*SHINING* handbook to high abilities management. Granada: Aconcagua).

Renzulli, J. (2012). Reexamining the Role of Gifted Education and Talent Development for the 21st Century: A Four-Part Theoretical Approach. *Gifted Child Quarterly, 56.* 150-159. https://doi.org/10.1177/0016986212444901.

Rinn, A. N., & Bishop, J. (2015). Gifted Adults: A Systematic Review and Analysis of the Literature. *Gifted Child Quarterly, 59(4)*, 213 -235. https://doi.org/10.1177/0016986215600795.

Roberts, J. L. (1999). The Top 10 Events Creating Gifted Education for the New Century. *Gifted Child Today*, *22*(6), 53–55. https://doi.org/10.1177/107621759902200615

Ryff, C. D. (2013). Psychological well-being revisited: Advances in the science and practice of eudaimonia. *Psychotherapy and Psychosomatics*, 83(1). https://doi.org/10.1159/000353263

Schlegler, M. (2022). Systematic Literature Review: Professional Situation of Gifted Adults. *Frontiers in psychology*, *13*, 736487. https://doi.org/10.3389/fpsyg.2022.736487.

Silverman, L. K. (2013). *Giftedness 101*. Springer Publishing

Stuart, D. (2014). *Web metrics for library and information professionals*. Facet

Subotnik, R. F., & Rickoff, R. (2010). Should eminence based on outstanding innovation be the goal of gifted education and talent development? Implications for policy and research. *Learning and Individual Differences, 20*(4), 358-364. https://doi.org/10.1016/j.lindif.2009.12.005.

Subotnik, R. F., Olszewski-Kubilius, P., & Worrell, F. C. (2011). Rethinking Giftedness and Gifted Education. *Psychological Science in the Public Interest*, 12(1). https://doi.org/10.1177/1529100611418056

Terman, L. M. (1925). Mental and physical traits of a thousand gifted children. In *Genetic studies of genius* (Vol. 1). Stanford University Press.

Tuddenham, R. D. (1948). Soldier intelligence in World Wars I and II. *American Psychologist, 3*(2), 54–56. https://doi.org/10.1037/h0054962