

Mapping the landscape: A comprehensive bibliometric and visualization analysis of ethnic-racial socialization research

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Abstract Ethnic-racial socialization serves as a critical protective mechanism in the psychological development and identity formation of minority youth. Despite its increasing relevance in today's multicultural societies, a systematic overview of the scholarly evolution and intellectual structure of this domain remains limited. This study aims to bridge this gap by performing a comprehensive bibliometric and visualization analysis of the ERS research landscape spanning two decades, from 2004–2024. Bibliographic data were meticulously retrieved from the Web of Science Core Collection, yielding a final dataset of 2,646 relevant articles. The advanced visualization capabilities of CiteSpace 6.3 are utilized. R1, we conducted a multidimensional analysis of annual publication trajectories, geographic collaboration networks, and thematic clusters to decipher key trends. The results demonstrate a substantial exponential increase in publication volume, reflecting a rapidly growing academic interest globally. Geographically, the discourse is driven predominantly by scholars in the United States, followed by Canada and the Netherlands, with multidisciplinary contributions integrating psychology, family studies, sociology, and ethnic studies. The identification of major thematic clusters reveals that core research foci have shifted from foundational concepts such as "ethnic identity," "racial discrimination," and "African Americans" to more nuanced domains such as "social cognition" and "transracial adoption." Currently, research hotspots heavily emphasize developmental outcomes, including "self-esteem," "mental health," "family dynamics," and "academic achievement." Furthermore, burst detection analysis identifies emerging frontiers such as "psychological adjustment," "racial socialization practices," "color-blind ideologies," and the impact of "low income" contexts. These findings not only highlight the interdisciplinary nature of the field but also provide a strategic roadmap for researchers and practitioners to identify existing gaps, fostering future cross-cultural investigations and evidence-based interventions in contemporary society.

Keywords: scientometrics, citespace, minority youth, science mapping, identity development

1. Introduction

Ethnic-racial socialization research began over four decades ago, initially focusing on ethnic minorities in the United States (Kulish et al., 2019). Ethnic-racial socialization refers to the process through which parents convey information about race and ethnicity to their children (Hughes et al., 2006). This process plays a crucial role in minority families, helping children value their ethnic identity, understand diversity, and prepare for potential discrimination, which, in turn, fosters their ethnic identity and self-esteem (Dimitrova et al., 2018; Yip et al., 2019). It is a core component of child-rearing in these families. Parents from diverse ethnic backgrounds impart information about ethnic characteristics and racial identity to their children, emphasizing the importance of their group membership (Hughes et al., 2006). This information may encompass various topics, including ethnic pride, ethnic history and traditions, awareness of discrimination, intergroup vigilance and mistrust, as well as concepts of intergroup diversity and equality (Richmond & Pittman, 2016; Hughes et al., 2006; Umaña-Taylor & Fine, 2004). Parents are central agents in the ethnic-racial socialization process, with peer influence (Rivas-Drake et al., 2009) and a broader neighborhood and community context (Smith et al., 2003) complementing their role. Research has shown that ethnic-racial socialization serves as a protective factor for minority adolescents, helping them cope with negative experiences related to their disadvantaged status (Coll et al., 1996) while also enhancing their ethnic identity (Yin et al., 2016), thereby promoting positive developmental outcomes among minority youth (Grills et al., 2016).

The United States leads in this research due to its racial and immigration issues, with a focus on both racial socialization and ethnic socialization. Early studies focused on African Americans, but recent research has expanded to include Chinese and Latino populations, exploring impacts on self-identity, self-esteem, and positive adaptation (Reynolds, 2017; Bentley-Edwards, 2009). In recent years, scholars have increasingly focused on the study of ethnic-racial socialization. In multiethnic countries, ethnic-racial socialization is crucial for national unity, progress, and development, significantly impacting the ethnic unity psychology of minority youth. Although ethnic-racial socialization does not prevent discrimination, it can alleviate its negative



psychological effects (Banerjee et al., 2011). Scholars from various fields have conducted theoretical and empirical studies on ethnic-racial socialization from different perspectives, yielding many research findings.

Although a substantial body of work exists regarding ethnic-racial socialization, it has predominantly centered on distinct outcomes or specific demographic subsets (Hughes et al., 2006; Umaña-Taylor & Hill, 2020), leaving the field's macrolevel evolutionary trajectories and burgeoning focal points largely unexplored. Furthermore, conventional literature reviews typically rely on descriptive summaries or qualitative synthesis, methodologies that may restrict the visibility of large-scale temporal shifts and structural patterns (Wang et al., 2020). To address this limitation, the present research employs a quantitative bibliometric strategy to systematically examine the scholarly literature indexed in the Web of Science Core Collection. Through this analytical framework, this study aims to construct a holistic map of the domain, providing researchers with a comprehensive perspective on the status quo and the dynamic evolution of ethnic-racial socialization inquiry (Chen, 2006; Donthu et al., 2021).

Bibliometric analysis employs mathematical and statistical methodologies to characterize the quantitative evolution, distribution, and structural patterns of scholarly documents (Guler et al., 2016). As a quantitative research method, bibliometrics has the advantage of identifying research patterns through the analysis of large volumes of academic publications. By mapping the evolution of research topics, key academic contributions, and existing gaps, this approach provides a comprehensive overview that may be overlooked in previous qualitative reviews. CiteSpace, a prominent visualization tool, is used to display the results of bibliometric studies via knowledge maps, facilitating a clearer understanding of complex data (Li & Chen, 2016).

This study addresses the following core questions: (1) How has the volume of publications and citation rates evolved in ethnic-racial socialization research over the last two decades? (2) What are the main research directions and hotspots within the field of ethnic-racial socialization? (3) Which research topics are currently at the forefront of the field and have strong potential for future development? These questions aim to provide readers with a clearer understanding of the current state of ethnic-racial socialization research.

The primary objectives of this study are to systematically review and summarize the existing body of research on ethnic-racial socialization, offering a comprehensive understanding of the current research landscape. This study aims to reveal key research areas, trace the development and evolution of ethnic-racial socialization research, and identify emerging trends. Furthermore, it seeks to outline the overall trajectory of the field, uncover research gaps, and propose future research directions. In doing so, this study hopes to offer new perspectives and insights for advancing research on ethnic-racial socialization, thereby contributing to the continued growth of the field.

2. Materials and Methods

2.1. Data sources

The data for this study were sourced from the Web of Science Core Collection, a widely recognized and authoritative academic database that spans multiple disciplines, ensuring the academic rigor and reliability of the data. The primary reasons for selecting this database are its extensive coverage and standardized data, which contribute to the reliability and reproducibility of the study's findings. Additionally, Web of Science offers detailed citation indexing, which facilitates bibliometric analysis and knowledge mapping via CiteSpace, enabling the identification of trends and research frontiers within the field.

To ensure comprehensive data collection, various search strategies were employed, including the use of different keywords and careful selection of the database. The search term was defined as TS = ("ethnic socialization" OR "racial socialization" OR "ethnic-racial socialization" OR "racial-ethnic socialization"). This set of search terms captures the range of expressions related to ethnic-racial socialization. The literature search was conducted for publications from 2004–2024, with data retrieval and download occurring on May 28, 2024. The search was limited exclusively to peer-reviewed journal articles, selecting only those classified as "articles." This search resulted in 2,646 relevant documents. Upon importing the data into CiteSpace for deduplication, no duplicates were found, confirming that all 2,646 documents were unique and relevant to the study. These documents were then exported and saved in TXT format to serve as the data sample for this analysis.

2.2. Research tools

The bibliometric analysis tool employed in this study is CiteSpace 6.3. R1, alongside the built-in analysis features of the Web of Science. CiteSpace, a Java-based software, facilitates the visualization of knowledge maps within specific research domains, allowing for the detection of emerging research trends (Chen et al., 2015). This tool is especially valuable for scholars seeking to understand and stay informed about the evolving dynamics within their field. The visual maps generated by CiteSpace consist primarily of nodes and links: nodes represent entities such as authors, institutions, and countries, whereas the links between nodes indicate collaborations, cooccurrences, or cocitations. The color of nodes and links represents different years, and the size of a node reflects its frequency of occurrence or citation (Chen et al., 2006). In this study, CiteSpace was

used to perform a bibliometric analysis on the literature data obtained, supplemented by analyses from the Web of Science to derive the research findings. All the tables included in this manuscript were created via Microsoft Word.

2.3. Parameter configuration and interface adjustment

In conducting the visualization analysis of authors, keywords, and cited references, time slicing was set to one year, with the top 50 items selected for analysis in each slice. Clustering within the documents utilized noun-based terminology from keywords and the latent semantic indexing (LSI) algorithm, with network pruning applied via Pathfinder and merging with the pruned network. The visualization settings were adjusted to "cluster view-static, merged network" for display. Initially, the bibliometric approach was used to present the annual publication volume and citation frequency of ethnic-racial socialization research over the past two decades, analyzing trends over this period to assess the development and research trajectory of the ethnic-racial socialization field in recent years.

In the scientific knowledge map analysis, CiteSpace visualization tools were subsequently employed to conduct frequency analysis and co-occurrence network visualization for two types of nodes: cited references (for clustering analysis of research directions and identification of key nodal documents) and keywords (for analyzing the evolution of research hotspots). This methodological framework provides a comprehensive overview, offering a deep understanding of the dynamics and progress within the field of ethnic-racial socialization.

2.4. Data validation and limitations

While this bibliometric analysis provides a comprehensive overview of the field, certain methodological limitations must be acknowledged. First, the data were exclusively retrieved from the Web of Science Core Collection (WoS). Although WoS is widely recognized for its high-quality indexing and suitability for visual analysis via CiteSpace, this reliance on a single database may inevitably exclude relevant publications found only in other repositories, such as Scopus or Google Scholar, as well as gray literature. Second, the restriction to English-language publications may introduce a linguistic bias, potentially underrepresenting indigenous perspectives or studies published in local languages, particularly from non-Western contexts.

With respect to data quality, strict quality control measures were implemented beyond automated retrieval. A manual expert validation process was performed to ensure the accuracy of the dataset. Two researchers independently screened the titles and abstracts of the retrieved records to verify their relevance to the topic of ethnic-racial socialization. Irrelevant articles, book reviews, and editorial materials were manually excluded to ensure that the final dataset used for visualization strictly represented high-quality, peer-reviewed academic research.

3. Results

3.1. Publication count

The annual volume of published papers is widely regarded as a crucial metric for assessing the evolution and current state of research fields. This study analyzes 2,646 articles on ethnic-racial socialization to uncover publication trends and citation dynamics from 2004--2024, thereby highlighting the growth and maturation of literature in this domain. As shown in Figure 1, there has been an overall increase in the number of published articles over the examined decades (see Figure 1). The publication period can be divided into three distinct phases.

Slow growth phase (2004--2013): During this period, the average annual publication volume remained relatively low, with the highest annual count not exceeding 95 articles. From 2004--2006, the number of publications gradually increased from 22--43, followed by steady growth through 2013.

Steady growth phase (2014--2018): This phase involves a significant increase in the average annual publication volume. The number of publications in 2014 was 90, which gradually increased over the following years, reaching a peak of 146 articles in 2016. The publication counts stabilized at approximately 133--142 articles in the subsequent years.

Rapid growth phase (2019--2023): This period experienced the most pronounced increase, with the annual publication count surpassing 100 articles. A sharp increase was observed, from 183 articles in 2019 to a peak of 326 articles in 2023. This rapid growth indicates increased academic interest and a focus on ethnic-racial socialization topics.

Since the year 2024 has not yet concluded, the number of published articles for this year remains uncertain. As such, the publication volume for 2024 is only an estimated prediction and is subject to increase as more articles are published by the end of the year.

Overall, the trend reflects a growing interest in ethnic-racial socialization research, with publication numbers peaking in recent years. This demonstrates the increasing relevance and attention the topic has garnered in the academic community.

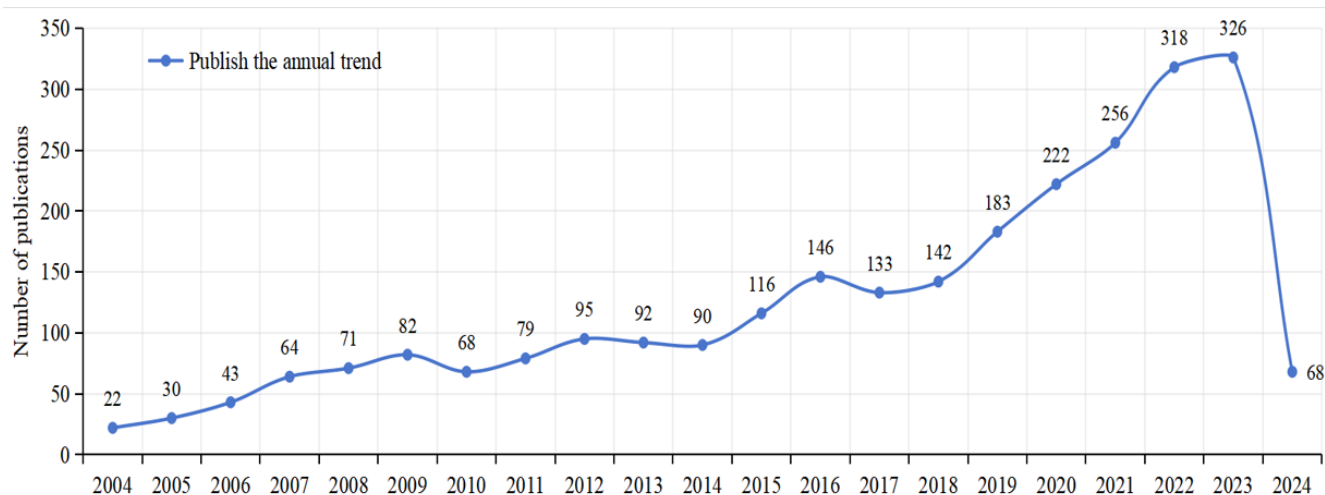


Figure 1 Annual trend distribution of the number of documents issued in the WoS core collection database from 2004—2024. *Source:* Compiled by the author Shujing Yao based on Web of Science Core Collection (2024).

3.2. Main country of study

From 2014–2024, the top five countries contributing to ethnic-racial socialization research were the United States, Canada, the Netherlands, the United Kingdom, and Germany, nations that are characterized by significant immigrant populations and have long-standing governmental focus on racial and ethnic issues. Notably, the United States led the field with 2,109 publications, accounting for approximately 79.71% of the total, as illustrated in Figure 2.

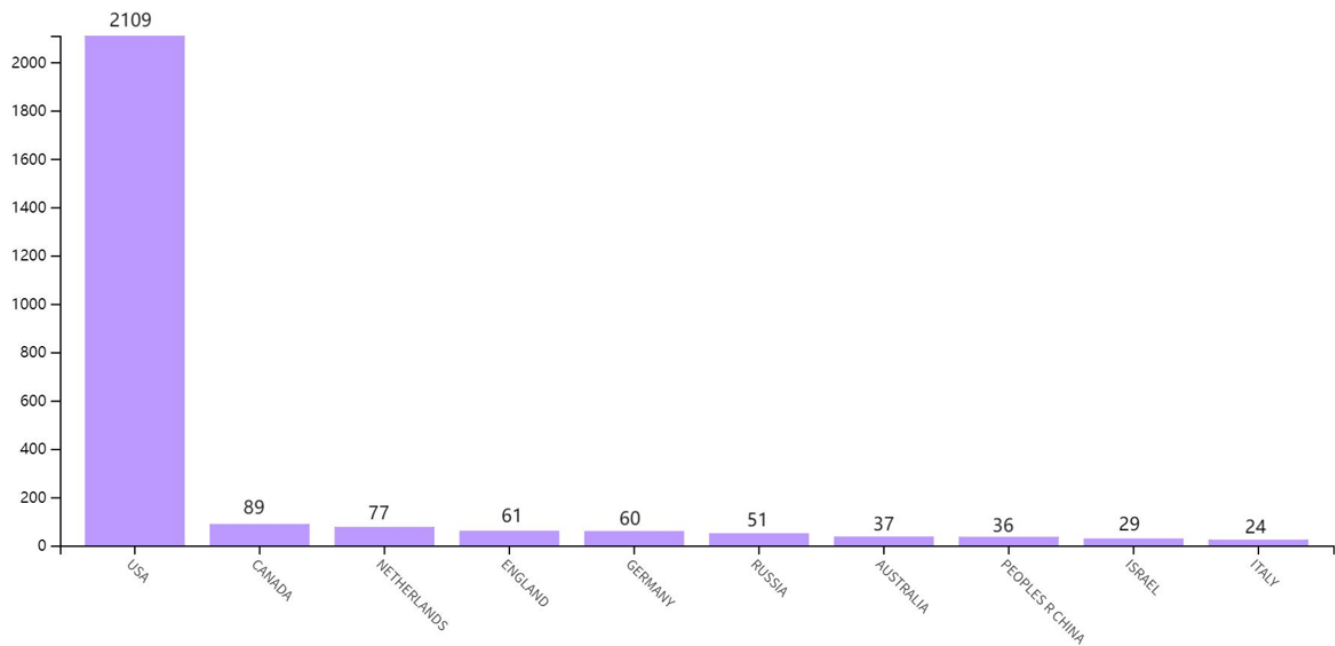


Figure 2 Distribution of Literature by Country. *Source:* Compiled by the author Shujing Yao based on Web of Science Core Collection (2024).

In bibliometric studies, while the information on the countries where research is published may not directly reflect the countries where the research samples are drawn from, it still provides valuable insights into the global academic focus on ethnic-racial socialization. Identifying the countries in which research on ethnic-racial socialization has been published offers a clear picture of the regions where significant academic efforts are being made. For example, the United States, Canada, and the Netherlands have emerged as key contributors to ethnic-racial socialization research because of their longstanding focus on racial and ethnic issues, as well as their multicultural societies. These countries have seen substantial academic output in the field of ethnic-racial socialization, making them central hubs of knowledge production and dissemination.

3.3. Distribution of research areas

From 2004–2024, research on ethnic-racial socialization spans multiple disciplines, primarily psychology, family studies, ethnic studies, sociology, and social work (only the top 10 research areas by publication count are presented in Table 1). This



highlights the multidisciplinary and interdisciplinary nature of the field. Notably, the literature exploring ethnic-racial socialization from a psychological perspective is the most prolific, with 1,413 publications, accounting for approximately 53.40% of the total (see Table 1).

Table 1 Distribution of research areas in ethnic-racial socialization studies.

Field (Research Areas)	Record Count	Proportion
Psychology	1413	53.40
Family Studies	396	14.97
Ethnic Studies	292	11.04
Sociology	280	10.58
Education Educational Research	275	10.39
Social Work	189	7.14
Social Sciences Other Topics	167	6.31
Psychiatry	125	4.72
Public Environmental Occupational Health	100	3.78
Government Law	97	3.67

Source: Compiled by the author Shujing Yao based on Web of Science Core Collection (2024).

3.4. Coauthor analysis

The coauthor analysis conducted in this study aims to illuminate collaboration patterns and identify key contributors within the field of ethnic-racial socialization (see Figure 3). By examining the frequency and structure of coauthorship relationships, this analysis offers valuable insights into the central scholars who are actively shaping the field, as well as the collaborative networks that facilitate knowledge production within this domain. Understanding these collaboration dynamics is essential for gaining a deeper comprehension of the development of ethnic-racial socialization research and for recognizing the prominent figures driving its advancement. The chosen time span covers the period from 2014--2024, with annual intervals serving as the time slices. The node type selected is "author," and the "Selection Criteria" section is set to "Thresholds," which facilitates the creation of an ethnic-socialization coauthor network map. In this visualization, each node represents an author; the size of the node corresponds to the number of publications by the author, with larger nodes indicating higher publication counts. The width of the links connecting the nodes serves as a visual indicator of the intensity of research cooperation; thicker lines denote stronger partnerships between the respective authors. The core collaborative relationships are relatively stable, yet there are also distinct groups and individual researchers who conduct their studies independently. The most prominent node in the map centers around the research team led by Umaña-Taylor, Adriana J (as shown in Figure 3), which has published 53 papers. Her extensive collaborations with other key researchers, such as Lisa Kiang, Howard C. Stevenson, and Deborah Rivas-Drake, underscore her influential role in the advancement of ethnic-racial socialization research. Other notable researchers, including Kimberly A. Updegraff, George P. Knight, and Su Yeong Kim, also exhibit significant centrality within the network. Their frequent coauthorships indicate their critical contributions and active engagement in collaborative research.

3.5. Knowledge base analysis

Cocitation refers to the relationship that arises when two publications cite the same prior work, providing insights into the foundational knowledge of a research area through cocitation analysis (Chen et al., 2012). Publications with high cocitation frequencies are considered key nodal documents that potentially represent significant theoretical innovations and emerging frontiers in their fields (Wei et al., 2020). As shown in Table 2, the five publications with the highest cocitation frequencies establish a solid knowledge base for the study of ethnic-racial socialization. Notably, the most cited work is by Umaña-Taylor, A. J., & Hill, N. E., published in 2020 in the Journal of Marriage and Family, titled "Ethnic-racial socialization in the family: A decade's advance on precursors and outcomes." This study offers a comprehensive review and synthesis of a decade of research progress in understanding the mechanisms and effects of ethnic-racial socialization within families. This work explores how various elements of family dynamics serve as both precursors to and outcomes of ethnic-racial socialization, highlighting the reciprocal relationships between these factors. This article is a critical resource for understanding the nuanced ways in which ethnic-racial socialization practices are embedded within the family context and how they shape the developmental trajectories of children in culturally diverse settings.



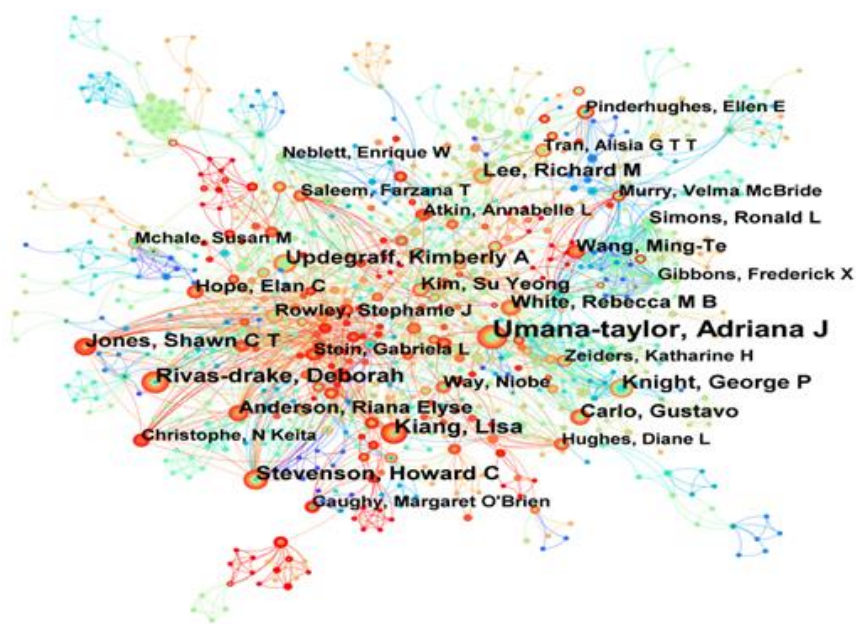


Figure 3 Coauthorship network map. *Source:* Compiled by the author Shujing Yao based on Web of Science Core Collection (2024).

The publication ranked second in terms of cocitation frequency by Anderson, R. E., & Stevenson, H. C., which was published in 2019 by American Psychologists. The article is titled "RECASTing racial stress and trauma: Theorizing the healing potential of racial socialization in families." This article argues for the essential role of racial socialization in promoting healing and resilience among family members facing racial adversities, emphasizing its potential to transform how individuals and families perceive and respond to racial challenges.

The publication ranked third in cocitation frequency is by Wang, M.-T., Henry, D., Smith, L., Huguley, J. P., & Guo, J., published in 2020. The article, titled "Parental ethnic-racial socialization practices and the construction of children of color's ethnic-racial identity: A research synthesis and meta-analysis," provides a comprehensive review and statistical analysis of the literature to elucidate the mechanisms through which parental ethnic-racial socialization influences the identity development of children. The study highlights the importance of these practices in fostering positive racial identities and coping strategies in racially diverse societies.

The publication ranked fourth in cocitation frequency is authored by Huguley, J. P., Wang, M.-T., Vasquez, A. C., & Guo, J., published in 2019 in the Psychological Bulletin. The article, also titled "Parental ethnic-racial socialization practices and the construction of children of color's ethnic-racial identity: A research synthesis and meta-analysis," compiles and analyzes various studies to evaluate how different parental socialization practices influence the development of ethnic-racial identity among children of color. It emphasizes the critical role of parental ethnic-racial socialization in shaping children's identities and their coping mechanisms in response to racial and ethnic experiences.

The fifth most cited publication is by Hughes, D., Rodriguez, J., Smith, E. P., Johnson, D. J., Stevenson, H. C., & Spicer, P., published in 2006. The article, titled "Parents' ethnic-racial socialization practices: A review of research and directions for future study," provides a comprehensive review of the existing research on parental ethnic-racial socialization practices, highlighting key findings and suggesting future research directions. This article serves as a foundational work that has guided subsequent research in the field, offering a detailed examination of the mechanisms through which parents influence their children's understanding and navigation of racial and ethnic contexts.

3.6. Major clusters of research directions

This study employed CiteSpace to conduct a cocitation analysis of the sampled literature from 2004--2024, using annual time slices. The node type was set to "Reference," and the threshold criterion selected the top 50% of the most cited references per slice, with a maximum of 100 references. To simplify the network and emphasize its key features, the "Pathfinder" algorithm and the "Pruning the Merged Network" strategy were applied, with all other parameters set to their default values. The resulting cocitation network map for ethnic-racial socialization research is shown in Figure 4.

The final cocitation network cluster map generated 10 clusters, with a modularity Q value of 0.84 (>0.3), indicating a well-defined cluster structure. The mean silhouette score was 0.9429 (>0.7), confirming that the clusters were efficiently and convincingly delineated (Chen et al., 2015). Owing to space limitations, this paper summarizes the top seven major clusters, each containing more than 50 nodes, representing the principal research directions in the field of ethnic-racial socialization from 2004--2024. Each node within these clusters had a silhouette score exceeding 0.8, reflecting excellent internal

homogeneity (Chen et al., 2015). Detailed information on the number of nodes, silhouette scores, and labels for these seven clusters is provided in Table 3.

Table 2 Information on the literature ranked in the top 5 in total citation frequency.

No.	Article Authors, Title, Published Journal and Time	Co-Citation Count
1	Umaña-Taylor, A. J., & Hill, N. E. (2020). Ethnic-racial socialization in the family: A decade's advance on precursors and outcomes. <i>Journal of Marriage and Family</i>	149
2	Anderson, R. E., & Stevenson, H. C. (2019). RECASTing racial stress and trauma: Theorizing the healing potential of racial socialization in families. <i>American Psychologist</i>	140
3	Wang, M.-T., Henry, D., Smith, L., Huguley, J. P., & Guo, J. (2020). Parental ethnic-racial socialization practices and children of color's psychosocial and behavioral adjustment: A systematic review and meta-analysis. <i>American Psychologist</i>	113
4	Huguley, J. P., Wang, M.-T., Vasquez, A. C., & Guo, J. (2019). Parental ethnic-racial socialization practices and the construction of children of color's ethnic-racial identity: A research synthesis and meta-analysis. <i>Psychological Bulletin</i>	111
5	Hughes, D., Rodriguez, J., Smith, E. P., Johnson, D. J., Stevenson, H. C., & Spicer, P. (2006). Parents' ethnic-racial socialization practices: A review of research and directions for future study. <i>Developmental Psychology</i>	85

Source: Compiled by the author Shujing Yao based on Web of Science Core Collection (2024).

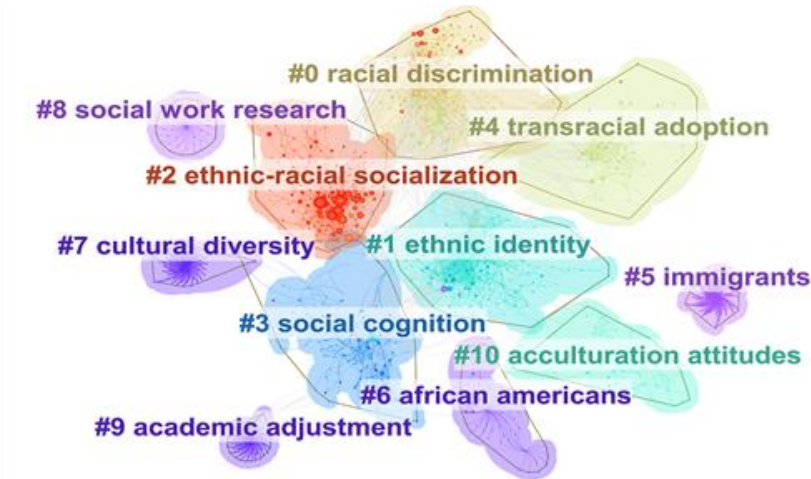


Figure 4 Cocitation network cluster map. Source: Compiled by the author Shujing Yao based on Web of Science Core Collection (2024).

Table 3 Main clusters of cocited references.

Cluster ID	Size	Silhouette	Cluster Labels
0	207	0.862	racial discrimination
1	202	0.919	ethnic identity
2	170	0.957	ethnic-racial socialization
3	113	0.873	social cognition
4	83	0.968	transracial adoption
5	64	1	immigrants
6	55	0.999	african americans

Source: Compiled by the author Shujing Yao based on Web of Science Core Collection (2024).

The seven clusters identified are "racial discrimination," "ethnic identity," "ethnic-racial socialization," "social cognition," "transracial adoption," "immigrants," and "African Americans." Through the analysis of these clusters and related literature, several key directions in ethnic-racial socialization research can be deduced.

The first category focuses on the evolution of the concept of ethnic socialization. Scholars initially studied ethnic and racial socialization separately on the basis of the demographic groups involved. Ethnic socialization is often associated with studies on multiethnic immigrants from Latin America, Asia, and the Caribbean, emphasizing how different ethnic youth and their families maintain cultural customs and ethnic identities while under pressure to assimilate into mainstream culture. In contrast, racial socialization is linked to studies involving African Americans, exploring how parents foster ethnic and racial awareness in their children and prepare them to face racial discrimination in the United States (Aldana & Byrd, 2015).



As immigration leads to the coexistence of diverse ethnic groups and transracial adoptions, researchers have noted considerable overlap between ethnic and racial socialization in practical research contexts. Consequently, some scholars have proposed the term "ethnic-racial socialization" to refer to the process by which parents transmit both ethnic and racial information to their children (Hughes et al., 2006).

The second thematic area in ethnic-racial socialization research centers on the types and components involved. Research indicates that for ethnic socialization to be effective, children must actively engage with and perceive the ethnic traits and racial information imparted by their parents, a process termed ethnic socialization awareness (Tran & Lee, 2010). Therefore, ethnic socialization comprises two distinct phases: the transmission of ethnic socialization content and the subsequent awareness of this content among children (Yin et al., 2016). Historically, as early as 1997, Hughes and Chen identified three critical components of ethnic socialization: cultural socialization, preparation for bias, and promotion of mistrust (Hughes & Chen, 1997). Hughes and her colleagues later expanded this framework to include a fourth component—racism—resulting in a widely accepted classification of ethnic socialization within the global academic community. Studies consistently show that parents most frequently convey cultural socialization messages that include information about ethnic heritage and history, cultural knowledge, and a sense of ethnic pride (Hughes et al., 2006).

The third category focuses on the pathways of transmitting ethnic-racial socialization information. The literature reveals that families and schools are pivotal in shaping the ethnic socialization of children and adolescents, with each playing a distinct role. Families are the most potent conduits of ethnic socialization information. Particularly in the United States, within African American and immigrant families, ethnic socialization is integral to teaching children about their racial and ethnic heritage, serving as a fundamental aspect of parenting in minority households (Yin et al., 2010). Researchers have also noted that in multiethnic societies, white children benefit from ethnic socialization to adapt better to a multicultural environment, necessitating that white parents proactively impart relevant ethnic and racial knowledge at home (Hughes et al., 2006). On the other hand, schools represent a crucial avenue for ethnic socialization. As children mature into teenagers and young adults, their sources of socialization information broaden to include interactions with peers, teachers, and the curricula offered at educational institutions. In general, the information schools provide encompasses cultural socialization, critical consciousness, the enhancement of cultural intelligence, mainstream cultural values, and approaches to colorblindness (Aldana & Byrd, 2015).

The fourth category explores the interplay between ethnic-racial socialization and other psychological variables. This research provides two main insights: ethnic and racial elements significantly foster the positive development of minority youth. Research indicates that the development and well-being of youth subjected to racial and ethnic discrimination are not universally impacted. Factors such as racial identity, racial socialization, and cultural orientation play both promotive and protective roles in the positive development of minority children and adolescents (Neblett et al., 2012). Therefore, when examining the relationship between ethnic socialization and psychological health, it is essential to consider the different dimensions of socialization, their interactions, and the influence of familial and environmental contexts.

Moreover, ethnic-racial socialization significantly influences individual psychological adaptation. Minority identity often subjects minority groups to various forms of stress. A meta-analysis revealed that African Americans' experiences of racial discrimination correlate with significant psychological distress (Pieterse, 2012). Ethnic socialization is identified as a pivotal predictor of the psychological adjustment of minority individuals (Umaña-Taylor & Hill, 2020). Research by Reynolds and colleagues has demonstrated that ethnic-racial socialization can mitigate anxiety and depression, enhance self-esteem and resilience, and alleviate the negative outcomes associated with discrimination (Reynolds & Gonzales-Backen, 2017).

3.7. Analysis of research hotspots and evolution

Research hotspots are key themes in a field that have attracted significant attention over a defined period, as evidenced by a substantial body of related academic work. Analyzing these hotspots enables researchers to identify the core areas that have attracted the most scholarly focus over time and to trace the evolution of research perspectives. Keyword co-occurrence frequency analysis provides valuable insights into identifying these research hotspots (Wei et al., 2020).

Therefore, we identify research hotspots in ethnic-racial socialization by analyzing keyword frequency in this study. In CiteSpace, the settings remained unchanged, with "keyword" selected as the node type. To observe the temporal evolution of research hotspots, we selected the "time zone" view, which resulted in the keyword co-occurrence network time zone map displayed in Figure 5.

On the basis of the timeline of the keyword co-occurrence of ethnic-racial socialization, we can discern significant thematic shifts and expansions over the decades. Initially, from 2004–2008, the dominant themes focused on the formation of ethnic and racial identities, with an emphasis on understanding how young people navigate and internalize their racial and ethnic backgrounds. During this period, key terms such as "identity," "ethnic/racial identity," and "self-esteem" were central, reflecting a psychological focus on individual identity development. This early phase predominantly focused on the intrapersonal aspects of ethnic-racial socialization, examining how identity formation influences self-perception and mental well-being. However, a closer look at the evolution of these themes reveals that the broad categorization of "identity formation" may obscure important distinctions between related concepts. For example, while "self-esteem" and "ethnic/racial identity" are closely linked, they are distinct constructs with different implications for socialization. Identity formation is

fundamentally tied to how individuals come to understand and define themselves in relation to their racial and ethnic contexts, whereas self-esteem deals more directly with an individual's valuation of themselves in the broader social landscape. Therefore, future research should carefully consider these distinctions and ensure that categories are not overly generalized.



Figure 5 Time Zone Map of the Keyword Co-occurrence Network.

Source: Compiled by the author Shujing Yao based on Web of Science Core Collection (2024).

As the field advanced into the next decade, particularly from 2009--2013, there was a noticeable broadening of the research scope. While the focus on identity persisted, new themes emerged, incorporating more social dynamics and developmental perspectives. Keywords such as "academic achievement," "school engagement," and "cognitive development" became prominent, signaling a shift toward examining how ethnic-racial socialization impacts educational trajectories and developmental milestones during childhood and adolescence.

The years 2014 to 2018 saw further diversification, with a growing emphasis on mental health and protective factors within the context of ethnic-racial socialization. The increasing frequency of terms such as "community," "mental health," and "protective factors" suggests a heightened interest in understanding how social support systems, including family, peers, and broader community structures, mitigate the negative effects of discrimination and stress. This shift reflects a broader trend in social science research that acknowledges the importance of community resources and resilience factors in mental health outcomes. However, the clustering of these themes requires further clarification. For example, while mental health and community are interconnected, they represent distinct areas of research. Mental health can be seen as an outcome of various protective factors, including community support, but it should not be conflated into a single category.

From 2019 onward, ethnic-racial socialization research expanded to engage with deeper, more complex aspects of identity and social justice. The increasing prevalence of terms such as microaggressions, racial discrimination, and critical consciousness signals a growing recognition of systemic inequality and the need for a more nuanced understanding of how discrimination affects ethnic minorities. These shifts reflect the field's responsiveness to ongoing social movements and its growing commitment to social justice. Additionally, the theme of family dynamics continues to emerge as a significant area of focus. Keywords such as "family," "parents," and "socialization" reflect the central role that family plays in shaping ethnic-racial identity. However, it is important to note that while socialization processes are often linked to family structures, this category must be treated separately from related themes such as adjustment and acculturation. The challenges of adapting to a new cultural environment and the psychological adjustments that accompany this process are crucial, but they should not be conflated with socialization, which is fundamentally about how individuals internalize and interact with societal values, norms, and racial/ethnic identity.

This evolution of research themes from focusing on individual identity development to examining the role of community, family dynamics, and systemic inequalities underscores the field's responsiveness to shifting societal challenges. This reflects a growing understanding of how ethnic-racial socialization shapes individuals' racial and ethnic identities within the broader sociocultural context. As the field progresses, it moves toward a more nuanced exploration of the intersecting influences of

social structures, cultural adaptation, and discrimination, offering a more holistic perspective on how ethnic-racial socialization impacts both individual well-being and societal cohesion.

Table 4 presents the high-frequency keywords used in the study of ethnic-racial socialization. An analysis of the data in Table 4 reveals the following primary research hotspots in the field of ethnic-racial socialization from 2004--2024. First, it focuses on identity development and psychological outcomes. This area is particularly concerned with the formative stages of identity formation among adolescents. Central terms such as "identity," "ethnic/racial identity," "self-esteem," and "mental health" converge to underline the intense focus on how young individuals understand and internalize their racial and ethnic backgrounds. The emphasis here is on the profound psychological effects that these identity processes have on self-perception and overall mental well-being.

Table 4 High-frequency keyword ranking table (top 30).

Keywords	Frequency	Keywords	Frequency
adolescents	886	perceptions	163
socialization	758	stress	163
discrimination	758	academic achievement	159
ethnic/racial socialization	717	black	147
ethnic/racial identity	557	behavior	146
identity	551	health	146
african american	499	school	145
race	434	parents	135
family	326	adjustment	132
experiences	292	acculturation	128
mental health	266	mothers	126
self esteem	212	achievement	117
american	201	model	117
attitudes	193	ethnic socialization	114
gender	191	latino	106

Source: Compiled by the author Shujing Yao based on Web of Science Core Collection (2024).

Second, the analysis extends to the role of family and social contexts. It is evident that the family unit and wider social interactions play critical roles in the transmission and shaping of racial and ethnic identities. Keywords such as "socialization," "family," and "parents" indicate an exploration into how these environments both support and challenge identity development. This segment of the research provides invaluable insights into the dynamics that either facilitate or impede effective socialization processes within familial and social settings.

Third, the influence of educational environments is examined. The keywords "academic achievement" and "school" reflect a sustained interest in how educational contexts affect ethnic-racial socialization. This theme scrutinizes the dual role of schools in influencing identity formation and either mitigating or reinforcing racial and ethnic discrimination. Understanding the educational sector's impact is crucial for deciphering how these institutions can support or obstruct the academic and social progress of ethnically diverse students.

Finally, the challenges of cultural adaptation and systemic discrimination should be considered. This area integrates terms such as "acculturation," "adjustment," and "discrimination," shedding light on the multifaceted challenges encountered by ethnic minorities across various cultural landscapes. This theme delves into the complex adaptive processes and the systemic barriers that affect cultural integration, with a particular focus on combating discrimination and fostering equality within different societal structures.

3.8. Analysis of emerging research fronts

In bibliometrics, "burst terms" refer to keywords that suddenly increase in frequency during a specific period, with higher burst strengths indicating cutting-edge research topics. Using CiteSpace software, the top 25 keywords with the strongest citation bursts were identified. Analysis of these burst terms revealed key concepts such as "transracial adoption," "psychological adjustment," "racial socialization practices," "color blind," "low income," "associations," and "Chinese" as the frontiers of relation research (see Table 5).

From the data, significant terms such as "Mexican American," "low income," "political socialization," and "transracial adoption" highlight ongoing shifts in research focus. These keywords reflect a broadening scope from initial studies centered on specific ethnic groups to a wider examination of how various sociopolitical and economic factors influence ethnic-racial identity formation and socialization practices.

The progression of keywords over time illustrates an adaptive response to changing societal conditions and emerging academic interests. For example, the focus on "college students" and "depressive symptoms" suggests increased attention to

the educational settings and mental health aspects of socialization, indicating a holistic approach to studying how environments influence ethnic-racial identity development.

Moreover, the introduction of terms such as “color blind” and “social consequences” in more recent years points toward a critical exploration of contemporary ideologies and their impact on social attitudes and behaviors concerning race and ethnicity. This shift underscores a growing scholarly interest in analyzing and addressing the outcomes of socialization strategies in a diverse and increasingly interconnected society.

The lifecycle of these burst terms, typically ranging from 3--6 years, with some persisting longer, provides insights into the dynamic nature of research focus areas in ethnic-racial socialization. The enduring presence of certain keywords over extended periods indicates their foundational role and sustained relevance in ongoing scholarly investigations.

Table 5 Top 25 keywords with the strongest citation bursts.

Keywords	Year	Strength	Begin	End	2014 - 2024
predictors	2004	6.96	2004	2010	
mexican american	2004	6.34	2004	2012	
political socialization	2004	5.85	2004	2011	
intergenerational transmission	2004	5.39	2004	2016	
competence	2005	7.9	2006	2011	
ethnic differences	2005	6.77	2007	2018	
beliefs	2007	5.81	2007	2017	
academic achievement	2005	8.13	2009	2012	
patterns	2004	6.25	2010	2017	
transracial adoption	2007	7.88	2011	2019	
low income	2005	8.71	2012	2017	
self	2005	7.31	2014	2016	
Chinese	2005	8.43	2015	2019	
depressive symptoms	2005	6.6	2015	2019	
racial socialization practices	2007	7.59	2016	2020	
mexican	2009	6.38	2016	2019	
white	2004	6.68	2017	2019	
perspective	2009	7.34	2018	2021	
psychological adjustment	2010	8.3	2019	2021	
socialization practices	2016	6.02	2019	2022	
consequences	2004	5.69	2019	2021	
minority	2009	14.31	2020	2024	
associations	2013	11.82	2020	2022	
color blind	2018	11.47	2020	2024	
college students	2011	6.1	2020	2022	

Source: Compiled by the author Shujing Yao based on Web of Science Core Collection (2024).

In summary, the emergent keyword analysis not only delineates the evolving landscape of ethnic-racial socialization research but also highlights how the field is responding to broader societal changes and deepens its inquiry into complex, multidimensional factors affecting ethnic and racial groups. This evolving focus reflects a maturing discipline that increasingly values interdisciplinary approaches and comprehensive understandings of how individual and collective identities are shaped by a myriad of social forces.

4. Discussion

This paper offers a thorough bibliometric analysis of the ethnic-racial socialization literature spanning from 2004--2024, highlighting publication trends, key research directions, influential works, and emerging research frontiers. The findings are summarized as follows:

The overall landscape of publications and citations in the field of ethnic-racial socialization has shown a steady upward trajectory. Over the past two decades, there has been a significant increase in the annual volume of publications, reflecting the growing academic interest and the recognized importance of this area of research. Geographically, countries such as the United States, Canada, and the Netherlands are prominent in the network because of their multicultural societies and active engagement with racial and ethnic issues. These regions have seen an increase in publications driven by societal focuses on race dynamics (Martsinkovskaya et al., 2019). However, it is important to distinguish between the country of publication and

the country of the research sample. The country of publication reflects the location of the scholar or institution, while the research sample may come from various regions. For example, European researchers may examine ethnic-racial socialization in African American communities. Therefore, while knowing where research is published helps track global interest, understanding the country of the sample is equally crucial for assessing applicability (Byrd & Hope, 2020).

A critical observation from this geographic analysis is the heavy concentration of research within Western contexts (Henrich et al., 2010). This distribution highlights a significant gap in the literature regarding the Global South and non-Western societies. Ethnic-racial socialization is not a phenomenon unique to Western minority groups; it is equally relevant in multiethnic societies in Africa, Asia, and Latin America, where colonial histories and migration patterns shape identity dynamics. The current reliance on Western frameworks may limit the cross-cultural applicability of existing theories. For example, socialization practices in the Global South may be driven more by indigenous cultural preservation or nation-building than by the minority-majority dynamics typical of the U.S. (Nsamenang, 2007). Future scholarship must expand to include these underrepresented regions to validate the universality of ERS constructs and understand how socialization practices adapt to different sociopolitical landscapes (Bornstein, 2017).

In terms of the knowledge base, high-impact publications such as Umaña-Taylor and Hill's (2020) review on ethnic-racial socialization within families and Anderson and Stevenson's (2019) study on racial stress and trauma underscore the importance of these works in shaping the field. These seminal publications form a solid theoretical framework, elucidating the mechanisms and outcomes of socialization (Rosnati & Ferrari, 2014; Ferrari et al., 2015). The key research directions identified include "ethnic identity," "racial discrimination," "social cognition," and "transracial adoption" (Farr & Hrapczynski, 2020). These areas often overlap, with foundational works acting as bridges that facilitate the transition from one phase of theoretical development to another.

Keyword co-occurrence analysis highlights the main research hotspots and their evolution over time. High-frequency keywords such as "identity," "self-esteem," "mental health," "family," and "academic achievement" suggest a progression from focusing on intrapersonal and familial aspects to addressing broader social dynamics and mental health implications. This shift reflects the interdisciplinary nature of the field. For example, research on Black college students revealed that ethnic identity exploration was associated with academic achievement, although mental health factors, such as depressive symptoms, moderated this relationship (DeLaney et al., 2022). Similarly, strong and positive ethnic identity is linked to better adolescent mental health, particularly through the impact of racial socialization.

Finally, the emergent research frontiers underscore the field's maturation, addressing complex issues such as transracial adoption, socioeconomic influences, and critical consciousness. These trends are evidenced by studies showing how ethnic identity buffers against the stress of racial discrimination (Huguley et al., 2019). The increasing focus on identity-based coping mechanisms and "low income" contexts reflects a deeper understanding of how ethnic identity interacts with societal structures. The field has progressively expanded from focusing on individual identity formation to addressing broader social justice issues. Future research should continue to explore these complex dimensions, fostering a comprehensive understanding of ethnic-racial socialization in an increasingly interconnected and diverse world.

5. Final Considerations

This comprehensive bibliometric analysis mapped the intellectual structure and evolution of research on ethnic-racial socialization (ERS) over the past two decades. By visualizing the data from 2004 to 2024, the study answers the central research questions regarding publication trends, key thematic clusters, and collaborative networks. The findings reveal that the field has undergone exponential growth, particularly following 2019, reflecting a heightened academic responsiveness to global racial justice movements.

The analysis identified that the core of ERS research rests on four fundamental pillars: ethnic-racial identity, racial discrimination, transracial adoption, and mental health. These themes demonstrate that the scientific community views socialization not merely as a parenting practice but as a crucial protective mechanism against systemic racism and a foundational element of psychological well-being. Furthermore, the evolution of keywords indicates a significant theoretical shift in the field, moving from descriptive studies of family practices toward more complex frameworks integrating social justice, racial trauma, and psychological adaptation.

A critical contribution of this work is the identification of a persistent geographical imbalance. The intense concentration of knowledge production in the United States, Canada, and the Netherlands highlights a Western-centric bias in current literature. This suggests that existing theoretical models may not fully capture the nuances of racial socialization in the Global South or in contexts with different historical racial dynamics.

In conclusion, this study consolidates the understanding of ERS as a multidimensional and expanding field. It contributes to the literature by delineating the "invisible colleges" of authors and institutions driving this domain and by pinpointing the urgent need for cross-cultural diversification. Future research agendas should prioritize validating ERS constructs in non-Western populations and exploring the intersectionality of race with other social identities, ensuring that the scientific understanding of socialization is as diverse as the families it seeks to serve.

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6. Declarations

6.1. Ethical considerations

Not applicable. This study is a bibliometric analysis of existing published literature and does not involve primary data collection from human or animal subjects.

6.2. Use of artificial intelligence (AI)

The authors declare that the generative artificial intelligence (AI) tool Gemini was used exclusively for initial translation and language editing. The use of AI was limited to linguistic improvement and did not influence the scientific content, study design, data analysis, data interpretation, results, or conclusions of the manuscript. Full responsibility for the content remains with the authors.

6.3. Conflict of interest

The authors declare that they have no conflicts of interest.

6.4. Funding

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