

## **Being beautiful and successful: a bibliometric analysis on the consumption of orofacial harmonization for esthetic purposes, attractiveness, and materialism**

**Ser bonito e bem-sucedido: estudo bibliométrico sobre o consumo estético da harmonização orofacial, a atratividade e o materialismo**

**Ser bello y tener éxito: un estudio bibliométrico sobre el consumo de armonización orofacial con fines estéticos, atractivo y materialismo**

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**João Roberto Rocha Lemos**

ORCID: <https://orcid.org/0000-0001-8211-2636>

Universidade do Vale do Itajaí, Brazil

E-mail: [joaorobertolemos@gmail.com](mailto:joaorobertolemos@gmail.com)

**Danielle Cristina Alves Rigo**

ORCID: <https://orcid.org/0000-0002-7683-1180>

Universidade Federal de Santa Catarina, Brazil

E-mail: [dani-riggo@hotmail.com](mailto:dani-riggo@hotmail.com)

**Mariane Cardoso**

ORCID: <https://orcid.org/0000-0001-9936-7942>

Universidade Federal de Santa Catarina, Brazil

E-mail: [mariane\\_cardoso@hotmail.com](mailto:mariane_cardoso@hotmail.com)

**Luciana Merlin Bervian**

ORCID: <https://orcid.org/0000-0002-8683-4190>

Universidade do Vale do Itajaí, Brazil

E-mail: [lumerlin@univali.br](mailto:lumerlin@univali.br)

### **Abstract**

Actuality there is a consumer trend focused on body image, where being beautiful is synonymous with being successful. The search for attractiveness and the emphasis on materialistic values influence the consumption of products that can enhance appearance. The belief that symmetrical and more attractive faces indicate more successful people can lead to a significant increase in demand for esthetic procedures for orofacial harmonization. A bibliometric study at Web of Science Core Collection (WoS-CC) was conducted on July 03, 2021, to examine the scientific production on the influence of materialism and attractiveness on the demand procedures for orofacial harmonization with esthetic purposes. A search was conducted in WoS-CC from 2005 to 2021. The results showed that the year with the greatest scientific production on the proposed topic was 2020, and the country with the highest number of publications was the United States. The most frequently used keywords were "attractiveness," "beauty," "face," and "body image," and the two most cited authors were Laura Hurd Clarke and Meredith Griffin, who each had 151 citations. The subject area with the highest production was surgery. This study presented an overview of the global trend of scientific production on the subject. The results presented here also allow us to conclude that there seems to be a tendency to study the follow-up of changes in the behavior of the consumer of aesthetic orofacial harmonization procedures.

**Keywords:** Bibliometric analysis; Esthetics; Consumption; Cosmetic techniques.

### **Resumo**

As tendências do consumo contemporâneo estão voltadas para a estetização do corpo-imagem, onde ser bonito, significa ser bem-sucedido, indicando que a atratividade e o materialismo influenciam no consumo de produtos que possam agregar valor à imagem. Nesse enfoque, rostos simétricos e visivelmente mais agradáveis e atraentes, sugerem que as pessoas tenham mais sucesso, o que podem estar desencadeando um aumento significativo na procura de procedimentos estéticos de harmonização orofacial. Baseado nisso essa pesquisa objetivou apresentar um estudo bibliométrico relacionando as influências do materialismo e da atratividade física ao consumo estético de harmonização orofacial. Este estudo é caracterizado como uma pesquisa bibliométrica. Foi utilizada a base de dados Web of Science no período de 2005 a 2021. Os resultados mostraram que o ano de maior produção científica do tema proposto foi 2020, o país com maior número de publicações foram os EUA. As palavras-chave com maior frequência foram: "attractiveness", "beauty", "face" e "body-image", as duas autoras mais citadas foram Laura Hurd Clarke e Meredith Griffin que totalizaram 151 citações, cada. A área com maior produção foi o campo da cirurgia. Este estudo apresentou um panorama geral sobre a tendencia global da produção científica sobre o tema. Os resultados aqui

apresentados também permitem concluir que parece haver uma propensão ao estudo de acompanhamento das mudanças no comportamento do consumidor de procedimentos estéticos de harmonização orofacial.

**Palavras-chave:** Análise bibliométrica; Estética; Consumo; Técnicas cosméticas.

### Resumen

Hoy en día existe una tendencia de consumo centrada en la imagen corporal, en la que ser bello es sinónimo de tener éxito. La búsqueda del atractivo y el énfasis en los valores materialistas influyen en el consumo de productos que pueden mejorar la apariencia. La creencia de que los rostros simétricos y más atractivos revelan personas más exitosas puede llevar a un aumento significativo de la demanda de procedimientos estéticos para la armonización orofacial. Sobre esta base se realizó un estudio bibliométrico para examinar la producción científica sobre la influencia del materialismo y el atractivo en la demanda de procedimientos de armonización orofacial con fines estéticos, para lo cual se recogieron datos entre 2005 y 2021 de la base de datos Web of Science. Los resultados mostraron que el año con mayor producción científica sobre el tema propuesto fue 2020, y el país con mayor número de publicaciones fue Estados Unidos. Las palabras clave más utilizadas fueron "atractivo", "belleza", "rostro" e "imagen corporal" y las dos autoras más citadas fueron Laura Hurd Clarke y Meredith Griffin, con 151 citas cada una. El área temática con mayor producción fue la cirugía. Este estudio propuso un panorama general sobre la tendencia global de la producción científica sobre el tema. Los resultados también permiten concluir que parece haber una propensión al estudio de seguimiento de los cambios en el comportamiento del consumidor de procedimientos estéticos de armonización orofacial.

**Palabras clave:** Análisis bibliométrico; Estética; Consumo; Técnicas cosméticas.

## 1. Introduction

The trend for esthetic consumption is a phenomenon caused by the incentive to consume and is currently observed in the aestheticization of body image for self-promotion (Benevides et al., 2020). In general, esthetic consumption refers to the use of products or procedures that convey a sense of pleasure, change, and symbolism (Venkatesh & Meamber, 2008), which may be based on intrinsic ideas that don't necessarily correspond to the biological need for intervention (Charters, 2006). Thus, it is often observed that the pursuit of esthetic consumption tends to have materialistic aspects, i.e., appearance enhancement for social and financial benefits rather than needs (Dion et al., 1972; Kasser & Ahuvia, 2002; Kasser & Ryan, 2016).

A study on the relationship between esthetic consumption and materialism concluded that most people that undergo esthetic procedures are more materialistically inclined and see their body as a project and therefore use such procedures as a means to improve their social status and career (Henderson-King & Brooks, 2009).

The pursuit of material goods, money, and good looks is often linked to consumerist social norms on what it means to be beautiful and successful (Ching & Xu, 2019). This is because people who live in a culture that promotes the consumption of material goods are more likely to develop materialistic ideals (Ching & Xu, 2019; Henderson-King & Henderson-King, 2005). Higher levels of attractiveness are associated with greater demand for esthetic interventions, including surgery (Henderson-King & Henderson-King, 2005).

There are several studies on the influence of appearance on attractiveness in the context of social relationships (Assawavichairoj & Taghian, 2017; Bashour, 2006; Dion et al., 1972; Phillips et al., 1992; Tran Cao, 2020) and on the extent to which oral-dental aspects are important to both individuals (de Assis Braga et al., 2021; Henson et al., 2011) and dentists (Batwa, 2018). Individuals with more attractive appearance are perceived to have more positive personalities, to be more reliable and superior, and tend to have more professional and social success (Tran Cao, 2020). Good appearance is associated with social leadership roles (Di Francesco et al., 2022).

One study found that beauty and attractiveness was associated with a more symmetrical face (Fink & Penton-Voak, 2016). On the other hand, people with unusual facial asymmetry were considered unreliable, lazy, and less intelligent (Tran Cao, 2020). Facial esthetic procedures account for approximately 60% of overall esthetic procedures, which have as main goal the improvement of quality of life and satisfaction through a better appearance (Guthrie et al., 2017), in most cases, by improving facial symmetry (Kaipainen et al., 2016).

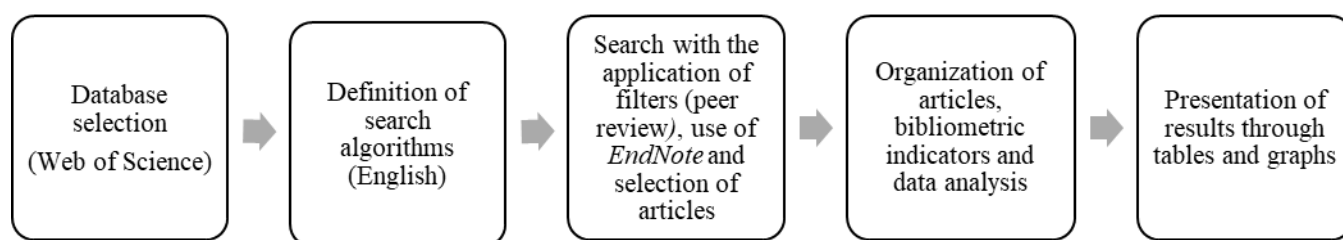
The growing demand for a more symmetrical face, a more beautiful and attractive smile in a wide variety of specialties, especially in dentistry, has led to an increase in cosmetic procedures such as orofacial harmonization (Tran Cao, 2020). Orofacial harmonization is any treatment performed with the goal of creating balance and symmetry between the facial thirds that can integrate function, esthetics, and health (Bass, 2015).

The aim of the present study was to present a bibliometric review of materialism and physical attractiveness in relation to consumption of orofacial harmonization for cosmetic purposes.

## 2. Methodology

This was a descriptive, exploratory, and bibliometric study. The three main laws of bibliometrics were used: Lotka's law (measures author productivity), Zipf's law (measures keyword frequency), and Bradford's law (measures journal productivity) (Broadus, 1987). The methodological steps based on the above laws are shown in Figure 1.

**Figure 1** - Methodological stages of the study.



Source: Authors.

A protocol consisting of nine steps was elaborated. First, the Web of Science Core Collection (WoS-CC) database was selected. The second step was to define the search algorithms in English focusing on the objective of the study - the terms esthetic consumption, attractiveness, materialism, marketing, orofacial harmonization, and consumption were defined. The database search was performed using Boolean operators and synonyms to retrieve more results. After a detailed study of the terms to be used, 4 search keys were determined (Table 1). Third, the actual search was performed. Fourth, search filters were applied that included articles in peer-reviewed journals, publications between 2005 and 2021, and available publications. The data was extracted on July 03, 2021.

**Table 1** - Search keys.

Ranking	Results	Search - Web of Science
# 1	223	TS=(("Aesthetic consumption") OR("Facial cosmetic surgery" OR "orofacial harmonization" OR "cosmetic") AND (materialism OR attractiveness OR marketing))
# 2	222	TS=(("cosmetic surgery") and (attractiveness or marketing or consumption or materialism or "orofacial harmonization"))
# 3	2	TS=(("Aesthetic consumption" OR esthetic consumption OR aesthetic* dentistry OR facial aesthetic* OR "facial cosmetic" OR "orofacial harmonization" OR "facial cosmetic surgery") AND (materialism OR attractiveness OR marketing))
# 4	595	TS=(("Aesthetic consumption" OR esthetic consumption OR aesthetic* dentistry OR facial aesthetic* OR "facial cosmetic" OR "orofacial harmonization" OR "facial cosmetic surgery") AND (materialism OR attractiveness OR marketing))

Source: Authors.

In the fifth step, the EndNote software was used to select articles by title, keywords, and abstract, based on the objective of the study. The sixth step consisted of organizing the selected articles in an Excel spreadsheet that indicated the

authors, year of publication, and source of each article. In addition, the "most frequent topics", the "most frequently used keywords", and the "field" were entered. In the seventh step, the bibliometric indicators for each article were calculated: number of citations of the article and authors. Other variables such as year of publication, country, language, and journal name were also included for explanatory purposes. In the eighth step, the bibliometric data were analyzed, and the results were presented in tables and graphs. The first eight steps took place on the same day to avoid bias. Finally, in the ninth step, the empirical analysis of the bibliometric data was performed, relating the theories to the algorithms and their relationships.

VOSviewer™ software was used to create graphical bibliometric networks. In the keyword map, a co-occurrence analysis was performed using the "all keywords" unit of analysis, considering those with at least three occurrences. In the map of citations per document, the minimum number of occurrences was five. On the maps, each cluster has a color and represents a group of closely related nodes. Terms with strong relationships are placed closer together. The lines connecting the results denote existing relationships, and the thicker lines indicate a stronger connection between two authors (Van & Waltman, 2018).

### 3. Results and Discussion

After applying the search keys, 1,042 articles were identified. After an individual analysis of the articles based on the eligibility criteria, 77 articles related to esthetic consumption of orofacial harmonization, materialism, and attractiveness were selected. Most of the scientific production were research articles (96.1%), followed by reviews (3.9%), and 1 article (1.3%) was written in a non-English language (German) (Leifeld et al.). The 10 most cited articles are listed in Table 2.

**Table 2** - Description of the 10 most cited articles.

Ranking	Authors	Article title	Journal	Citation	Year	Country
1	Clarke, Laura Hurd Griffin, Meridith	<i>Visible and invisible ageing: beauty work as a response to ageism</i>	<i>Aging &amp; Society</i>	117	2008	Canada
2	Bashour, Mounir	<i>History and current concepts in the analysis of facial attractiveness</i>	<i>Plastic And Reconstructive Surgery</i>	97	2006	Canada
3	Swami, Viren; Chamorro-Premuzic, Tomas Bridges, Stacey Furnham, Adrian	<i>Acceptance of cosmetic surgery: personality and individual difference predictors</i>	<i>Body Image</i>	90	2009	England
4	Henderson-King, Donna Brooks, Kelly	<i>Materialism, sociocultural appearance messages, and paternal attitudes predict college women's attitudes about cosmetic surgery</i>	<i>Psychology of Women Quarterly</i>	61	2009	USA
5	Nabi, Robin	<i>Cosmetic Surgery Makeover Programs and Intentions to Undergo Cosmetic Enhancements: a consideration of three models of media effects</i>	<i>Human Communication Research</i>	46	2009	USA

6	Mayes, Andrew; Murray, Paul Gerard; Gunn, David Andrew; Tomlin, Cyrena C.; Catt, Sharon; Wen, YB; Zhou, L.P; Wang, HQ; Catt, Michael; Granger.	<i>Aging appearance in China: biophysical profile of facial skin and its relationship to perceived age</i>	<i>Journal of The European Academy of Dermatology and Venereology</i>	33	2010	England
7	Clarke, Laura Hurd Repta, Robin Griffin, Meredith	<i>Non-surgical cosmetic procedures: older women's perceptions and experiences</i>	<i>Journal of Women &amp; Aging</i>	32	2007	Canada
	Zimm, A. Joshua Modabber, Milad Fernandes, Vinay Karimi, Kian Adamson, Peter A.	<i>Objective assessment of perceived age reversal and improvement in attractiveness after aging face surgery</i>	<i>Jama Facial Plastic Surgery</i>	30	2013	USA
9	Calogero, Rachel M. Pina, Aphrodit Sutton, Robbie M.	<i>Cutting words: priming self-objectification increases women's intention to pursue cosmetic surgery</i>	<i>Psychology of Women Quarterly</i>	25	2014	England
10	Carruthers, Alastair Sadick, Neil Brandt, Frederic Trindade de Almeida, Ada Regina Fagien, Steve Goodman, Greg J. Rapaldo, Herve Smith, Kevin Darmody, Sarah Gallagher, Conor J. Street, James Romagnano, Linda.	<i>Evolution of facial aesthetic treatment over five or more years: a retrospective cross-sectional analysis of continuous onabotulinumtoxin a treatment</i>	<i>Dermatologic Surgery</i>	21	2015	Canada

Source: Authors.

The selected articles had a total of 887 citations. After excluding self-citations (5.54%), 837 remained. The total number of citations ranged from 0 to 118 (mean 11.52). The h-index was 16, i.e., 16 articles were cited at least 16 times, of which (Bashour, 2006; Clarke & Griffin, 2008) two, were cited more than 90 times and can be considered classics (Garfield, 2013).

The authors who contributed most to the number of published articles are listed in Table 3. Eight authors published three studies each, and yet none is among the 10 most cited authors (Table 4). A total of 326 authors received 3,087 citations, of which 950 (30.79%) were among the 10 most cited authors. Laura Hurd Clarke and Meredith Griffin published 2 articles together in 2007 and 2008, receiving a total of 151 citations. The other authors were each cited 47 to 97 times.

**Table 3** - Main authors and number of publications.

Authors	Publications	%
Braz, Andre	3	3.9
Gallagher, Conor J.	3	3.9
Ishii, Lisa E.	3	3.9
Ishii, Masaru	3	3.9
Kontis, Theda C.	3	3.9
Nellis, Jason C.	3	3.9
Paper, Ira D.	3	3.9
Rhee, Seung Chul	3	3.9
Others	53	68.8
Total	77	100

Source: Authors.

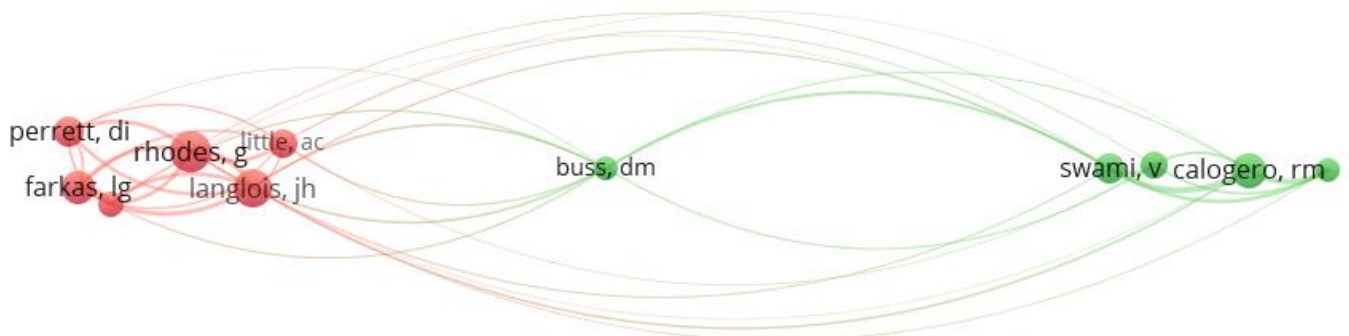
**Table 4** - Most cited authors and number of publications.

Authors	Publications	Citations
Clarke, Laura Hurd	2	151
Griffin, Meridith	2	151
Bashour, Mounir	1	97
Bridges, Stacey	1	95
Chamorro-Premuzic, Tomas	1	95
Furnham, Adrian	1	95
Swami, Viren	1	95
brooks, kelly	1	62
Henderson-King, Donna	1	62
Nabi, Robin L.	1	47
Total	12	950

Source: Authors.

The VOSviewer™ program was used to create a chart for co-citations, considering a minimum of 15 co-citations per author. Figure 2 shows a larger concentration of authors around the main authors, which brought together 6 different authors. In joint studies, David Michael Buss was linked to authors from the two different clusters.

**Figure 2** - Diagram of authors with a minimum of 15 co-citations.



Source: Authors.

A total of 26 publications (33.8%) were from the USA. The second most cited country was China, with 11 (14.3%) citations, followed by Canada with 7 (9.1%). The contribution from Brazil was 2.6%. Of the fields involved, surgery (25 articles), dermatology (12 articles), social psychology (4 articles), and multidisciplinary psychology (4 articles) accounted for 58.5% of the most cited publications. In addition to these, anatomy and morphology, anthropology, biology, public, environmental and occupational health, business, computing, artificial intelligence, engineering, dentistry, oral surgery and medicine, and multidisciplinary sciences were also involved.

The selected articles were from seven main institutions. Because of the similar number of studies, all institutions that contributed with at least 2 publications were selected. The institutions with the highest production were Johns Hopkins University and Northwest University, both higher private institutions in the United States, and the University of British Columbia, a Canadian public university. All had 3 (3.9%) publications each (Table 5).

**Table 5** - Institutions with the highest number of publications.

Institutions	Publications	%
<i>Johns Hopkins University</i>	3	3.9
<i>Northwest University</i>	3	3.9
<i>University British Columbia</i>	3	3.9
<i>Penn State University</i>	2	2.6
<i>Teuim Aesthet Plast Surg Clin</i>	2	2.6
<i>Toronto University</i>	2	2.6
<i>Wuhan University</i>	2	2.6
Others	60	77.9
Total	77	100

Source: Authors.

Table 6 shows the journals with the most publications, with emphasis on JAMA Facial Plastic Surgery with 7 publications (9.1%), Journal of Cosmetic Dermatology with 6 publications (7.8%), and Esthetics Surgery Journal with 5 publications (6.5%), all from the field of cosmetic surgery.

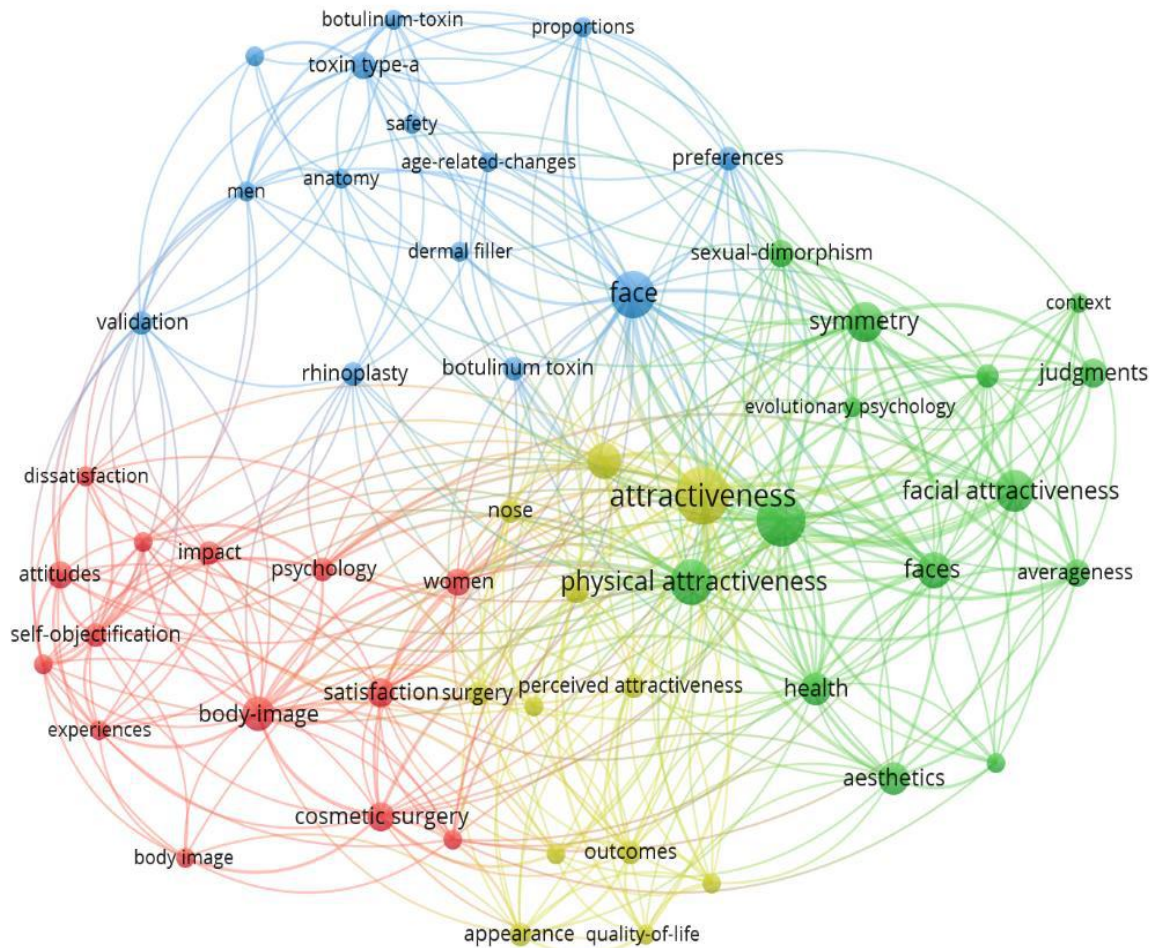
**Table 6** - Most cited journals.

periodicals	Publications	%
<i>Jama Facial Plastic Surgery</i>	7	9.1
<i>Journal Of Cosmetic Dermatology</i>	6	7.8
<i>Aesthetic Surgery Journal</i>	5	6.5
<i>Frontiers In Psychology</i>	4	5.2
<i>Dermatologic Surgery</i>	3	3.9
<i>Journal Of Drugs In Dermatology</i>	3	3.9
<i>Aesthetic Plastic Surgery</i>	2	2.6
<i>Archives Of Plastic Surgery-Aps</i>	2	2.6
<i>Body Image</i>	2	2.6
<i>Journal Of Experimental Social Psychology</i>	2	2.6
<i>Plastic And Reconstructive Surgery</i>	2	2.6
<i>Plos One</i>	2	2.6
<i>Psychology Of Women Quarterly</i>	2	2.6
Others	32	45.4
Total	77	100

Source: Authors.

Keyword co-occurrence analysis revealed 56 keywords distributed in 4 different clusters: "attractiveness" (22 occurrences), "beauty" (19 occurrences), "face" (15 occurrences), and "body image" (8 occurrences) (Figure 3).

**Figure 3** - Frequency of keywords.

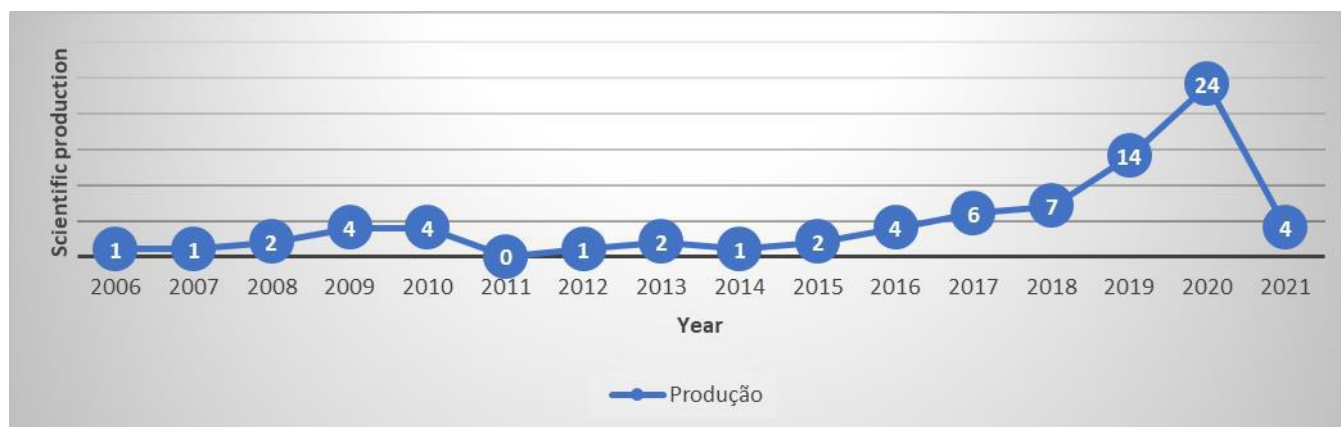


Source: Authors.

The year with the greatest scientific production on consumption of cosmetic orofacial harmonization, materialism, and attractiveness was 2020 with 24 articles (31.2%), followed by 2019 with 14 articles (18.2%). The year 2021 accounted for 5.2% with 4 publications. The number of citations followed the same order, that is, there was a trend in the increase of citations in recent years, with 2020 standing out in the research on esthetic consumption and its characteristics (Figure 4).



**Figure 4** - Annual scientific production.



Source: Authors.

#### 4. Final Considerations

Due to the importance of the growing demand for esthetic procedures for orofacial harmonization, this study aimed to analyze the scientific production on this topic from 2005 to 2021 using the Web of Science database. A combination of English keywords was used in the investigation. Using the developed search keys, 1,042 articles were identified, of which 77 were selected based on the inclusion criteria: 19 related to esthetic consumption, 40 to attractiveness, 2 to esthetic consumption and materialism, and 16 to esthetic consumption and attractiveness. None of the articles combined the terms esthetic consumption, materialism, and attractiveness. The 10 most cited articles, the most cited authors and the number of articles published, and the authors with the most links in co-citations were presented. In addition, the frequency of countries, productions, institutions, research areas, journals, keywords, and year of publication were analyzed.

Regarding Lotka's Law, the authors with the most publications were: Braz, Andre; Gallagher, Conor J.; Ishii, Lisa E.; Ishii, Masaru; Kontis, Theda C.; Nellis, Jason C.; Paper, Ira D; and Rhee, Seung Chul. Regarding Zipf's Law, four clusters were found: "attractiveness"; "beauty"; "face"; and "body image". Regarding the Bradford Law, the main journals were: *Jama Facial, Plastic Surgery, Journal of cosmetic Dermatology, Aesthetic surgery Journal, Frontiers in Psychology, Dermatologic Surgery, Journal of Drugs in Dermatology, Aesthetic plastic Surgery, Archives of plastic Surgery-Aps, Body Image, Journal of Experimental Social Psychology, Plastic and reconstructive Surgery, Plos One, Psychology of Women Quarterly*.

Our analysis shows that the scientific production on the studied topic has been increasing since 2015, which supports the fact that it is a new topic that has been gaining importance in the scientific arena.

The results of this study suggest that the scientific production on orofacial harmonization has followed consumer behavior. According to the International Society of Esthetic Plastic Surgery (2021), surgical esthetic procedures for the face and head are increasing in Brazil.

This article can serve as a bibliographic basis for studies on orofacial harmonization in the context of materialism and attractiveness and help researchers understand the development of research on this topic. In terms of practical contributions, this study shows that professionals directly involved in the provision of this type of service, such as dentists, have a good scientific basis from current studies to understand the motivations that lead to the consumption of orofacial harmonization and, consequently, to develop efficient marketing and business strategies focused on consumer behavior.

As a limitation, this study was based on only one database as a source of articles, thus some publications on the topic might have been missed. The reason for using WoS is that it is a database that contains the most important journals on the subject. Therefore, it appears that the subject still needs to be explored. Future studies should analyze the relationship between

the consumption of orofacial harmonization and materialism and attractiveness, as well as the effects of materialism and attractiveness on consumption of orofacial harmonization for esthetic purposes.

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