Review

2Ws + 1H Systematic Review to (Re)Draw Actors and Challenges of Participation(s): Focus on Cultural Heritage

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Abstract: The Council of Europe Framework Convention on the Value of Cultural Heritage for Society, better known as the Faro Convention, emphasizes the relevance of participation in cultural heritage and its clear potential benefits. Despite the growing literature on participation in cultural heritage, little research through systematic reviews has been conducted in this field. This paper explores definitions of participation, its actors, and its challenges with a focus on cultural heritage, and it aims to fill this gap by providing a systematic literature review based on PRISMA 2020 guidelines and Okoli guidelines. The results reflect on the definition of participation, the different actors involved, and the challenges facing participation in cultural heritage, based on the interactions of actors. Results further indicate that participation in cultural heritage specifically is in an early stage of adoption and that considerable effort is needed in assessing the adequate methodologies to face the challenges.

Keywords: participation; cultural heritage; state of art; cultural heritage; actors of participation; challenges of participation; democracy

1. Introduction

Participation has been an important topic in research across different disciplines, including cultural heritage. The panoply of definitions of participation, whether specific to a discipline or not, makes us acknowledge controversy over the term “participation”. Since 2005, the relevance of participation in cultural heritage has been institutionalized through The Council of Europe Framework Convention on the Value of Cultural Heritage for Society, better known as the Faro Convention. It emphasizes that the significance of cultural heritage lies less in the material aspect than in the meanings and uses people attach to them and the values they represent. The Faro Convention puts the people at the heart of the processes of identification, management, and sustainable use of heritage. This can have clear potential benefits [1], such as creating synergies of competencies among all the actors concerned to create democratic societies. It defends a broader vision of heritage and its relationship with communities and societies. Therefore, in its second article, the Faro Convention defines cultural heritage as “a group of resources inherited from the past which people identify, independently of ownership, as a reflection and expression of their constantly evolving values, beliefs, knowledge, and traditions. It includes all aspects of the environment resulting from the interaction between people and places through time”.

Although the scholarly literature on participation in cultural heritage has been growing since the Faro Convention, there are very few systematic literature reviews to date studying the application of participation in the cultural heritage sector. This highlights the need for an updated systematic study of the current uses of participation in cultural heritage. The relevance of our review is twofold. First, given the importance attributed by many stakeholders to participation, we aim to offer the reader balanced, rigorous key elements about participation, which can be used in cultural heritage as well as other disciplines.
Second, through the systematic review, we aim to make the extant body of knowledge on the research questions more transparent, without biases that can be caused by non-systematic reviews. The review was completed in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. PRISMA is an evidence-based minimum set of items for reporting in systematic reviews and meta-analyses. In our work, we used PRISMA as a basis for reporting the systematic review with objectives to answer research questions, rather than evaluating interventions (as it is primarily used for). We used an up-to-date tool recommended by the scientific community: PRISMA 2020.

The analysis focuses on English language scientific papers to (1) redraft a definition of participation, (2) identify the actors of participation, and (3) identify the challenges of participation. This study is motivated by the following three research questions (RQ):

RQ1: What is participation?
RQ2: Who are the actors involved in participation?
RQ3: What are the challenges faced by the actors of participation?

This article first describes the methods we used to carry out the systematic literature review. It then presents an overview of the results, which shed light on participation and its actors. Then, it presents critical analyses of the definitions of participation and its actors’ definitions (RQ1 and RQ2) to formulate answers to the participation challenges (RQ3) in the discussion. It concludes with key learning points, limitations, and avenues for further research.

2. Materials and Methods

Using PRISMA 2020 guidelines as well as Okoli’s guidelines to conduct a systematic literature review [2], we followed the protocol outlined below to carry out a systematic review of participation described in the literature. It is important to highlight that the PRISMA guidelines were originally developed for reporting reviews evaluating randomized clinical trials [3]. Thus, research in social sciences does not fully fit with all the steps of the PRISMA checklist because of the nature of the phenomena observed and the importance of interpretive approaches. PRISMA systematic literature reviews are carried out in social sciences until only the phase of qualitative synthesis, rather than until the phase of quantitative synthesis. However, the systematic nature of this approach contributes to the advancement of our insights since it ensures transparency and extensive reporting [4]. The PRISMA 2020 guidelines and Okoli framework can together offer a very rigorous method for systematic literature reviews. The following provides a detailed description of the Okoli method.

2.1. Identify the Purpose

The three research questions guiding this review.

2.2. Draft Protocol and Train the Team

As this study was conducted by one reviewer, training a team was not necessary.

A pilot search, composed of three sub-pilot searches, was constructed to identify studies to include in this systematic literature review.

2.2.1. Sub-Pilot Search A

Sub-pilot search A was conducted to identify where the keyword “participation” appeared in the titles of academic articles published and available online in the Scopus database. The option to choose a subject area is among Scopus tools to refine and filter the results. Since cultural heritage was not a subject area, among the other subject areas suggested by Scopus, we selected “Multidisciplinary”. Appendix A explains the Boolean search of the electronic databases used. The sub-pilot search A led to identifying 400 articles with 160 keywords. The keyword “participation” did not appear as a keyword on its own. We selected the top 20 keywords according to the number of results (full list attached) to see if the keyword “participation” was included in other keywords. “Social participation” is
the most recurrent keyword with “participation” included, found in 61 results. By adding the keyword “social participation”, we narrowed the scope of the search from 400 results to 61 results selected for our literature review. A first screening of the abstracts of the articles of the research results above allowed us to notice there were no articles related to cultural heritage.

2.2.2. Sub-Pilot Search B

Due to the absence of results related to cultural heritage in sub-pilot search A, we conducted a second sub-search to identify articles about participation and cultural heritage. We looked for “participation cultural heritage” in the titles of academic articles published and available online. Only nine articles appeared in the results.

2.2.3. Sub-Pilot Search C

Due to the lack of results related to cultural heritage found in the Scopus database through sub-pilot search B, and to complete our systematic review with other scientific studies, we identified articles through the search engine Google Scholar. To guarantee the use of the same method as in Scopus, we selected articles in which the keyword “participation cultural heritage” appeared in the titles. The total number of results, without including citations or patents, was 146. We selected 22 published papers from the last two years, 2021 and 2020, and they were available in open access. The choice of the last two years was made for two reasons: (1) to limit the number of articles selected for our literature review, as sub-searches A and B already provided 70 papers, and (2) to prioritize selecting updated sources.

Sub-search A was conducted on 15 February 2020 and was updated on 15 July 2021. Sub-search B was conducted on 01 July 2021, and sub-search C was conducted on 01 August 2021.

2.3. Apply Practical Screening

The aim of practical screening is to reduce the number of studies to be analyzed to a number that can be practically handled by the reviewers by deciding which studies should be considered for the review. Here, it is important to highlight that we did not exclude papers which were not related to participation in cultural heritage because we wanted to construct a theoretical framework of participation without limitation to a specific discipline (sub-search A). However, since our discipline is cultural heritage, we conducted sub-search B and sub-search C to include cultural heritage in the study.

2.4. Search for Literature

We identified all the studies that should be included in the review by using the PRISMA flowchart (Figure 1). The final step of a standard PRISMA approach, i.e., quantitative synthesis, could not be carried out, as the information provided in the papers selected for this literature review was not suitable for such an assessment since selected studies were mostly qualitative in their design and techniques.

2.5. Extract Data

Data relevant to each research question were systematically extracted from each article. Potentially relevant information regarding our research questions was carefully examined, extracted, compiled, and coded in an Excel file. Data were then charted using the formula to answer the 5Ws + 1H questions method [5]. This method is used in describing and analyzing a given situation or a problem by answering five questions beginning with the letter W (What, Where, When, Who, Why) and one question beginning with the letter H (How). Since all questions are open, i.e., none of them can be answered YES or NO, they do not allow sticking to one aspect of a given situation but show different “sides of the coin”. The 5Ws + 1H method creates the conditions for proper identification of the situation or the problem under analysis. Nonetheless, we acknowledge that applying the 5Ws + 1H
method may not work for every piece of research. It does, however, have the potential to present the major lines of research, especially in qualitative studies. In our research, since we aim to answer the research questions, we chose the elements of the following question:

‘What’ to answer RQ1: How is participation defined in the papers selected for the literature review? How do we define participation after the literature review?

‘Who’ to answer RQ2: Who are the main actors of participation?

When it comes to the questions ‘Why’, ‘When’ and ‘Where’, we assume that they are highly dependent on the objectives or/and the motives and the context of each study case (spatial and temporal). That is why we did not include them in our method. Hence, we refer to this adapted method as only 2Ws + 1H.

2.6. Appraise Quality

The reviewers need to explicitly spell out the criteria they use to judge which papers to exclude for insufficient quality, which is a process called ‘screening for exclusion’. In this step, we scored all included papers. We did not exclude any article that resulted from sub-searches A, B, and C. Both theoretical and practical papers were included.

2.7. Synthesize Studies

This step, also known as analysis, involves combining the facts extracted from the studies by using appropriate techniques, whether quantitative, qualitative, or both. In this systematic review, our synthesis regarding the answers to the research questions of participation, its actors, and its challenges is qualitative.

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**Figure 1. PRISMA 2020 flow diagram for the systematic review.**

On another hand, the ‘How’ question is not used as a tool question to answer RQ3: What are the challenges faced by the actors of participation? Rather, that a transition question between RQ2 and RQ3. We based our answers for participation challenges on the following question: how are the actors of participation interacting?

When it comes to the questions ‘Why’, ‘When’ and ‘Where’, we assume that they are highly dependent on the objectives or/and the motives and the context of each study case (spatial and temporal). That is why we did not include them in our method. Hence, we refer to this adapted method as only 2Ws + 1H.
2.8. Write the Review

In our case, this literature review was an opportunity for us to construct and report in sufficient detail such that other researchers can independently reproduce our review’s results, adopting the standard principles to be followed in writing research papers.

3. Results

As illustrated in Figure 1, the approach outlined above produced a listing of 92 papers. We excluded contributions that were not available online, not available in English, or duplicated. Based on this criterion, 77 articles were used for qualitative analysis from the Scopus database as well from the Google Scholar search engine. The list of the 77 articles selected can be seen below in Table 1: Papers included in the Systematic Review.

Sub-search A: A total of 61 articles were selected and included in the results. The 61 papers were all published between the years 2009 and 2021. This shows that the interest in participation research in multidisciplinary studies started around 10 years ago, although participation research started in the 20th century. This could be because multidisciplinary research started maturing not long before the late 2000s.

Sub-search B: Only 9 articles appeared, and 8 were included in the results for their availability in open access. The 8 papers were all published between the years 2012 and 2021. This rather small number of papers does not allow us to conclude substantive results. Hence, we conducted sub-search C.

Sub-search C: A total of 22 articles were selected. Only 8 were included in the results. In sub-search C, we decided to select the 22 papers published in the last two years. The choice of the last two years was made for two reasons: (1) to limit the number of articles selected for our literature review, as sub-searches A and B already provided 70 papers, and (2) to prioritize selecting up-to-date sources. The other 14 papers were excluded because they were not available online, not available in English, or duplicated.

3.1. What Is Participation?

(Re)Drawing a Definition for Participation: Terminology Matters

Among the selected articles, a large number of authors refer to participation only as “participation” [6,8–11,15,18,20,23,26,28,29,33,37–40,43,46,48,50,54,64–67,69,74] and as “social participation” [12,13,16,17,22,24,31,32,36,42,44,47,49,52,55,58–63]. Other terms are also frequently used, such as “community participation” [27,51,57,70–72,82]. The term “public participation” is used in three articles [75,77,80]. The term “citizen(s) participation” [76,78], “political participation” [7,19], and “social activities participation” [21,35] are used in two papers each. Less recent terms which appeared in only one paper each are “civic participation” [68], “collaborative engagement and participation” [41], “collective participation” [79], “daily participation” [30], “societal participation” [53], “user-community participation” [73], “voluntary participation” [25], “participation and social inclusion” [81], and “group participation” [45]. Other authors refer to participation without using the term participation, e.g., “social support” [34] and “involvement in life situations” [14]. In Scheme 1, we represent the main terminologies based on the number of times they are used in the selected articles. The results can be seen in Appendix B, Table A1: Charting Results for RQ1: What is participation?
Table 1. Papers Included in the Systematic Review.

| Year | Authors | Title | Reference |
|------|---------|-------|-----------|
| 2019 | Spaaij, R.; Lusher, D.; Jeanes, R.; Farquharson, K.; Gorman, S.; Magee, J. | Participation-performance tension and gender affect recreational sports clubs’ engagement with children and young people with diverse backgrounds and abilities | [6] |
| 2019 | Anastasopoulos, L.; Williams, J. | A scalable machine learning approach for measuring violent and peaceful forms of political protest participation with social media data | [7] |
| 2019 | Törnbom, K.; Lundälv, J.; Sunnerhagen, K. | Long-term participation 7–8 years after stroke: Experiences of people in working-age | [8] |
| 2019 | Sartas, M.; van Asten, P.; Schut, M.; McCampbell, M.; Awori, M.; Muchunguzi, P.; Tenywa, M.; Namazzi, S.; Sole Amat, A.; Thiele, G.; Proietti, C.; Devaux, A.; Leeuwis, C. | Factors influencing participation dynamics in research for development interventions with multi-stakeholder platforms: A metric approach to studying stakeholder participation | [9] |
| 2018 | Marsango, D.; Hansen, T.; Polanczky, C.; Santos, R. | Science-Technology-Society and the Social Participation in the Scientific-Technological Development | [10] |
| 2018 | Tarimo, E.; Ambikile, J.; Munseri, P.; Bakari, M. | Perception of potential harm and benefits of HIV vaccine trial participation: A qualitative study from urban Tanzania | [11] |
| 2018 | Ejiri, M.; Kawai, H.; Fujiwara, Y.; Ihara, K.; Watanabe, Y.; Hirano, H.; Kim, H.; Ishii, K.; Oka, K.; Obuchi, S. | Social participation reduces isolation among Japanese older people in urban area: A 3-year longitudinal study | [12] |
| 2018 | Jin, S.; Trope, G.; Buys, Y.; Badley, E.; Thavorn, K.; Yan, P.; Nithianandan, H.; Jin, Y. | Reduced social participation among seniors with self-reported visual impairment and glaucoma | [13] |
| 2018 | Maciver, D.; Rutherford, M.; Arakelyan, S.; Kramer, J.; Richmond, J.; Todorova, L.; Romero-Ayuso, D.; Nakamura-Thomas, H.; ten Velden, M.; Finlayson, I.; O’Hare, A.; Forsyth, K. | Participation of children with disabilities in school: A realist systematic review of psychosocial and environmental factors | [14] |
| 2018 | Ørjasæter, K.; Davidson, L.; Hedlund, M.; Bjerkset, O.; Ness, O. | “I now have a life!” Lived experiences of participation in music and theater in a mental health hospital | [15] |
| 2018 | Albers, W.; Roeg, D.; Niijsen, Y.; van Weeghel, J.; Borgers, I. | Profiling of victimization, perpetration, and participation: A latent class analysis among people with severe mental illness | [16] |
| 2018 | Tomioka, K.; Kurumatani, N.; Saeki, K. | The differential effects of type and frequency of social participation on IADL declines of older people | [17] |
| 2018 | Nyasani, D.; Mutua, G.; Sajabi, R.; Ng’ang’a, J.; Gachie, J.; Maina, A.; Lusike, L.; Anzala, A.; Price, M.; Manyonyi, G. | Reported willingness to participate in a hypothetical HIV vaccine trial and its translation to actual participation among healthy adults—Experience from Kenya | [18] |
| 2018 | Kornadt, A.; Hufer, A.; Kandler, C.; Riemann, R. | On the genetic and environmental sources of social and political participation in adolescence and early adulthood | [19] |
| 2018 | Dougall, A.; Martinez Pereira, F.; Molina, G.; Eschevins, C.; Daly, B.; Faulks, D. | Identifying common factors of functioning, participation and environment amongst adults requiring specialist oral health care using the International Classification of Functioning, disability and health | [20] |
| 2018 | De Wet, N.; Somefun, O.; Rambau, N. | Perceptions of community safety and social activity participation among youth in South Africa | [21] |
| 2018 | Katagiri, K.; Kim, J. | Factors determining the social participation of older adults: A comparison between Japan and Korea using EASS 2012 | [22] |
| Year | Authors | Title | Reference |
|------|---------|-------|-----------|
| 2017 | Protière, C.; Spire, B.; Mora, M.; Poizot-Martin, I.; Préau, M.; Doumergue, M.; Morlat, P.; Zucman, D.; Goujard, C.; Raffi, F.; Lambotte, O.; Suzan-Monti, M. | Patterns of patient and healthcare provider viewpoints regarding participation in HIV cure-related clinical trials. Findings from a multicentre French survey using Q methodology (ANRS-APSEC) | [23] |
| 2017 | Amagasa, S.; Fukushima, N.; Kikuchi, H.; Oka, K.; Takamiya, T.; Odagiri, Y.; Inoue, S. | Types of social participation and psychological distress in Japanese older adults: A five-year cohort study | [24] |
| 2017 | Chu, C.; Liu, J.; Shen, C.; Jin, J.; Shi, L. | Win-stay-lose-learn promotes cooperation in the prisoner’s dilemma game with voluntary participation | [25] |
| 2016 | Dal Grande, E.; Chittleborough, C.; Campostrini, S.; Dollard, M.; Taylor, A. | Pre-survey text messages (SMS) improve participation rate in an Australian mobile telephone survey: An experimental study | [26] |
| 2016 | Thompson, M.; Elliott, C.; Willis, C.; Ward, R.; Falkmer, M.; Falkmer, T.; Gubbay, A.; Girdler, S. | Can, Want and Try: Parents’ Viewpoints Regarding the Participation of Their Child with an Acquired Brain Injury | [27] |
| 2015 | Singam, A.; Ytterberg, C.; Tham, K.; von Koch, L. | Participation in Complex and Social Everyday Activities Six Years after Stroke: Predictors for Return to Pre-Stroke Level | [28] |
| 2015 | Mair, P.; Hofmann, E.; Gruber, K.; Hatzinger, R.; Zeileis, A.; Hornik, K. | Motivation, values, and work design as drivers of participation in the R open source project for statistical computing | [29] |
| 2015 | Arundell, L.; Hinkley, T.; Veitch, J.; Salmon, J. | Contribution of the After-School Period to Children’s Daily Participation in Physical Activity and Sedentary Behaviours | [30] |
| 2015 | Yamakita, M.; Kanamori, S.; Kondo, N.; Kondo, K. | Correlates of regular participation in sports groups among Japanese older adults: JAGES cross-sectional study | [31] |
| 2015 | Tomioka, K.; Kurumatani, N.; Hosoi, H. | Social participation and the prevention of decline in effectance among community-dwelling elderly: A population-based cohort study | [32] |
| 2015 | Hebert, J.; Møller, N.; Andersen, L.; Wedderkopp, N. | Organized sport participation is associated with higher levels of overall health-related physical activity in children (CHAMPS study-DK) | [33] |
| 2015 | Hancock, K.; Cunningham, N.; Lawrence, D.; Zarb, D.; Zubrick, S. | Playgroup Participation and Social Support Outcomes for Mothers of Young Children: A Longitudinal Cohort Study | [34] |
| 2015 | Roh, H.; Hong, C.; Lee, Y.; Oh, B.; Lee, K.; Chang, K.; Kang, D.; Kim, J.; Lee, S.; Back, J.; Chung, Y.; Lim, K.; Noh, J.; Kim, D.; Son, S. | Participation in Physical, Social, and Religious Activity and Risk of Depression in the Elderly: A Community-Based Three-Year Longitudinal Study in Korea | [35] |
| 31. | Witvorapong, N.; Muttarak, R.; Pothisiri, W. | Social Participation And Disaster Risk Reduction Behaviors In Tsunami Prone Areas. PLoS ONE 2015, 10 (7), e0130862. DOI: 10.1371/journal.pone.0130862 | [36] |
| 32. | Bender, A.; Kawachi, I.; Jørgensen, T.; Pisinger, C. | Neighborhood Deprivation Is Strongly Associated With Participation In A Population-Based Health Check. PLoS ONE 2015, 10 (6), e0129819. DOI: 10.1371/journal.pone.0129819 | [37] |
| Year | Authors | Title | Reference |
|------|---------|-------|-----------|
| 2015 | Vaz, S.; Cordier, R.; Falkmer, M.; Ciccarelli, M.; Parsons, R.; McAuliffe, T.; Falkmer, T. | Should Schools Expect Poor Physical and Mental Health, Social Adjustment, and Participation Outcomes in Students with Disability? | [38] |
| 2015 | Dasgupta, N.; Scircle, M.; Hunsinger, M. | Female peers in small work groups enhance women’s motivation, verbal participation, and career aspirations in engineering | [39] |
| 2015 | Ballester, R.; Huertas, F.; Yuste, F.; Llorens, F.; Sanabria, D. | The Relationship between Regular Sports Participation and Vigilance in Male and Female Adolescents | [40] |
| 2015 | Khatri, C.; Chapman, S.; Glasbey, J.; Kelly, M.; Nepogodiev, D.; Bhangu, A.; Fitzgerald, J. | Social Media and Internet Driven Study Recruitment: Evaluating a New Model for Promoting Collaborator Engagement and Participation | [41] |
| 2015 | Goll, J.; Charlesworth, G.; Scior, K.; Stott, J. | Barriers to social participation among lonely older adults: The influence of social fears and identity | [42] |
| 2014 | Forcey, D.; Walker, S.; Vodstrcil, L.; Fairley, C.; Bilardi, J.; Law, M.; Hocking, J.; Fethers, K.; Petersen, S.; Bellhouse, C.; Chen, M.; Bradshaw, C. | Factors Associated with Participation and Attrition in a Longitudinal Study of Bacterial Vaginosis in Australian Women Who Have Sex with Women | [43] |
| 2014 | Foley, K.; Girdler, S.; Bourke, J.; Jacoby, P.; Llewellyn, G.; Einfeld, S.; Tonge, B.; Parmenter, T.; Leonard, H. | Influence of the environment on participation in social roles for young adults with down syndrome | [44] |
| 2014 | Nakamaru, M.; Yokoyama, A. | The effect of ostracism and optional participation on the evolution of cooperation in the voluntary public goods game | [45] |
| 2014 | Kelly, J.; Stout, R.; Greene, M.; Slaymaker, V. | Young adults, social networks, and addiction recovery: Post treatment changes in social ties and their role as a mediator of 12-step participation | [46] |
| 2014 | Kanamori, S.; Kai, Y.; Aida, J.; Kondo, K.; Kawachi, I.; Hirai, H.; Shirai, K.; Ishikawa, Y.; Suzuki, K. | Social Participation and the Prevention of Functional Disability in Older Japanese: The JAGES Cohort Study | [47] |
| 2014 | Martin, K.; Cooper, R.; Harris, T.; Brage, S.; Hardy, R.; Kuh, D. | Patterns of leisure-time physical activity participation in a British birth cohort at early old age | [48] |
| 2014 | Nov, O.; Arazy, O.; Anderson, D. | Scientists@Home: What Drives the Quantity and Quality of Online Citizen Science Participation? | [49] |
| 2014 | Reimers, A.; Wagner, M.; Alvanides, S.; Steinmayr, A.; Reiner, M.; Schmidt, S.; Woll, A. | Proximity to Sports Facilities and Sports Participation for Adolescents in Germany Physical, Cognitive and Emotional Factors Contributing to Quality of Life, Functional Health and Participation in Community Dwelling in Chronic Kidney Disease | [50] |
| 2014 | Seidel, U.; Gronewold, J.; Volsek, M.; Todica, O.; Kribben, A.; Bruck, H.; Hermann, D. | Social Cohesion, Social Participation, and HIV Related Risk among Female Sex Workers in Swaziland | [51] |
| 2014 | Fonner, V.; Kerrigan, D.; Mnis, Z.; Ketende, S.; Kennedy, C.; Baral, S. | Does Social Isolation and Low Societal Participation Predict Disability Pension? A Population Based Study | [52] |
| 2013 | Gustafsson, K.; Aronsson, G.; Marklund, S.; Wikman, A.; Floderus, B. | Negative Life Events in Childhood as Risk Indicators of Labour Market Participation in Young Adulthood: A Prospective Birth Cohort Study | [53] |
| 2013 | Lund, T.; Andersen, J.; Winding, T.; Biering, K.; Labriola, M. | Social Participation and Dental Health Status among Older Japanese Adults: A Population-Based Cross-Sectional Study | [54] |
| 2013 | Takeuchi, K.; Aida, J.; Kondo, K.; Osaka, K. | | [55] |
Table 1. Cont.

| Year | Authors | Title | Reference |
|------|---------|-------|-----------|
| 2012 | Tewari, S.; Khan, S.; Hopkins, N.; Srinivasan, N.; Reicher, S. | Participation in Mass Gatherings Can Benefit Well-Being: Longitudinal and Control Data from a North Indian Hindu Pilgrimage Event | [56] |
| 2012 | Saïas, T.; Beck, F.; Bodard, J.; Guignard, R.; du Roscoït, E. | Social Participation, Social Environment and Death Ideations in Later Life | [57] |
| 2011 | Shattuck, P.; Orsmond, G.; Wagner, M.; Cooper, B. | Participation in Social Activities among Adolescents with an Autism Spectrum Disorder Factors Influencing Participation and Credit Constraints of a Financial Self-Help Group in a Remote Rural Area: The Case of ROSCA and ASCRA in Kemang Village West Java | [58] |
| 2009 | Anggraeni, L. | The contribution of social participation to differences in life expectancy and healthy years among the older population: A comparison between Chile, Costa Rica and Spain | [59] |
| 2021 | Rueda-Salazar, S.; Spijker, J.; Devolder, D.; Albala, C. | Effects of whole-body electromyostimulation on function, muscle mass, strength, social participation, and falls-efficacy in older people: A randomized trial protocol | [60] |
| 2021 | de Oliveira, T.; Felicio, D.; Filho, J.; Durigan, J.; Fonseca, D.; José, A.; Oliveira, C.; Malaguti, C. | Social participation and physical prefrailty in older Japanese adults: The Shimane CoHRE study | [61] |
| 2020 | Abe, T.; Okuyama, K.; Kamada, M.; Yano, S.; Toyama, Y.; Isomura, M.; Nabika, T.; Sakane, N.; Ando, H.; Miyazaki, R. | Willingness to engage in and current status of social participation among Chinese merchant sailors | [62] |
| 2020 | Wang, H.; He, Y.; Shi, L.; Wang, J.; Mia, L.; Dai, J. | Longitudinal association between lifetime workforce participation and risk of self-reported cognitive decline in community-dwelling older adults | [63] |
| 2020 | Tomioka, K.; Kurumatani, N.; Saeki, K. | Confidential, accessible point-of-care sexual health services to support the participation of key populations in biobehavioural surveys: Lessons for Papua New Guinea and other settings where reach of key populations is limited | [64] |
| 2020 | Kelly-Hanku, A.; Redman-MacLaren, M.; Boli-Neo, R.; Nosi, S.; Ase, S.; Aemo, H.; Nembari, J.; Amos, A.; Gabuzzi, J.; Kulup, M.; Willie, B.; Narokobi, R.; Hou, P.; Pekon, S.; Kaldor, J.; Badman, S.; Vallei, A.; Hakim, A. | A Qualitative Photo Elicitation Research Study to elicit the perception of young children with Developmental Disabilities such as ADHD and/or DCD and/or ASD on their participation in cultural activities | [65] |

Sub-search B

| Year | Authors | Title | Reference |
|------|---------|-------|-----------|
| 2021 | Davis, E.; Heravi, B. | Linked Data and Cultural Heritage: A Systematic Review of Participation, Collaboration, and Motivation | [66] |
| 2021 | Yan, W.; Chiou, S. | The safeguarding of intangible cultural heritage from the perspective of civic participation: The informal education of Chinese embroidery handicrafts | [67] |
| 2021 | Eichler, J. | Intangible cultural heritage, inequalities and participation: who decides on heritage? | [68] |
| 2020 | Bortolotto, C.; Demgenski, P.; Karampampas, P.; Toji, S. | Proving participation: vocational bureaucrats and bureaucratic creativity in the implementation of the UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage | [69] |
| 2020 | Li, J.; Krishnamurthy, S.; Pereira Rodgers, A.; van Wesemael, P. | State-of-the-practice: Assessing community participation within Chinese cultural World Heritage properties | [70] |
Table 1. Cont.

| Year | Authors | Title | Reference |
|------|---------|-------|-----------|
| 2020 | Li, J.; Krishnamurthy, S.; Pereira Rodgers, A.; van Wesemael, P. | Community participation in cultural heritage management: A systematic literature review comparing Chinese and international practices | [72] |
| 2017 | Seitsonen, O. | Crowdsourcing cultural heritage: public participation and conflict legacy in Finland | [73] |
| 2012 | Jett, J.; Senseney, M.; Palmer, C. | Enhancing cultural heritage collections by supporting and analyzing participation in Flickr | [74] |

Sub-search C

| Year | Authors | Title | Reference |
|------|---------|-------|-----------|
| 2020 | Nasrolahi A.; Messina V, Gena C. | Public Participation in Museums and Cultural Heritage Sites: iCommunity Mobile Application. | [75] |
| 2021 | Solovyavenko, N. | Legal Guarantees of Citizens’participation In Cultural Life, Access To Items Of Cultural Value And Preservation Of Cultural Heritage Objects | [76] |
| 2020 | Guo, Y.; Wang, Y. | Research on Public Participation in Recording Intangible Cultural Heritage in Rural Area Isolated identity, tourism and heritage: Social perception and participation in cultural heritage management for the transformation of tourism governance in Buenavista del Norte (Tenerife, Canary Islands, Spain) | [77] |
| 2020 | Stendardi, D, Perez, E, Castillo, A. and Garcia, J. I. | Collective participation at the service of cultural heritage: user-generated content in Portuguese memory institutions | [78] |
| 2020 | Borges, L. C.; Alvim, L. and Silva, A. | Rural Spatial Planning And Public Participation In Preserving Cultural Heritage Site | [79] |
| 2020 | Leite, C.; Acosta, C.; Militelli, F.; Jajamovich, G.; Wilderom, M.; Bonduki, N.; Somekh, N.; Herling, T. | Sao Paulo: Participation and Social Inclusion on Cultural Heritage | [80] |
| 2020 | Joshi Shrestha, R.J, Tripti Twayana, T. and Rajbanshi, E. | Socio-Cultural Aspect of Heritage Conservation and Community Participation in Bhaktapur | [81] |

Scheme 1. Terminology of participation used by the authors of the selected articles.
It is important to underline that the use of “participation” and “social participation” as the main keywords in our searches was potentially the reason why these two keywords appear as the most used terms to describe participation. In the following section, we classify the common terms used for participation into four groups according to dimension, actors, approach, and context. The results can be seen in Appendix B, Table A2: Classification of the common terms used for participation into four groups.

Participation definition according to dimension (28 papers): This category of definition is based on dimension, either social or political. In the results, social dimension-related definitions (26 papers) are used more than the political dimension-related ones (only 2 papers). Aside from the use of “social participation” in 21 papers, the other terms used for social dimension are “social inclusion” (1 paper), “social activities participation” (2 papers), “social support” (1 paper), and “societal participation” (1 paper). In regard to the political dimension definition, the main term is “political participation” (2 papers).

Participation definition according to actors (16 papers): This category of definition is based on defining participation according to who participates. In the results, the main terms used to describe definitions related to actors of participation are “citizen participation” (3 papers, “citizen”, “citizens”, “civic”), “community participation” (8 papers, “community participation”, 7 papers, “user-community participation”, 1 paper), “public participation” (3 papers), “collective participation” (1 paper), and “group participation” (1 paper).

Participation definition according to approach (2 papers): In this category of definition, the authors describe the practice or the approach of participation rather than the actors or the dimension of participation. Only 2 papers are based on defining participation from this perspective. Participation is defined in the first article [41] as “collaborative” and in the second article [25] as “voluntary”.

Participation definition according to context (1 paper): This can be temporal or spatial. In this literature review, the example we have is the temporal context with the example of “daily participation” (1 paper).

We excluded papers in which participation is defined as only “participation” (29 papers) or as “involvement in life situations” (1 paper) because they are too generic to be classified.

3.2. Who Are the Actors of Participation?

To address our second research question, the participants in each paper were examined. As we mentioned in the method, we chose papers in both multidisciplinary fields (sub-search A) and cultural heritage (sub-searches B and C). Therefore, it was often difficult to spot common categories of participants. It was, however, possible to identify clear types of participants who are frequently mentioned in studies about social participation and in studies about participation in cultural heritage. The sub-search A reveals that the most studied participants in multidisciplinary social participation papers are “older people” [12,13,17,22,24,31,32,35,42,47,48,55,57,60–62,64], “adults” [8,15,16,19,20,26,28,37,44,46,53,54], “citizens” [7,10,11,18,49], and “children” [6,14,27,30,33,66], as can be seen in Scheme 2 below. There is a significant difference among the rest of the descriptions, which include “students” [38,39,41] and “individuals or groups based on their sexual life” [42,43,65]. The “households and parents” category [34,59] and “patients” category [23,51] appear in two articles each, whereas “participants in religious events” [56], “participants in science projects” [29], and “individuals based on their profession” [63] are the subject of only one article for each category. Non-described profiles appear in two papers [25,45], and actors referred to as “multistakeholders” appear in one paper [9]. What we can retain from the clear variety in the participants is that most of the authors follow a categorization according to age or according to social activities of concern to the study.
In regard to participation in cultural heritage (sub-searches B and C), the terms used to describe actors of participation are more precise. Sub-searches B and C reveal that the most used term of actors in participation in the selected cultural heritage papers are “communities” [70, 71, 75, 78], then “GLAM” [67, 79], “users” [73, 74], and “citizens” [68, 76], as can be seen in Scheme 3 below. The rest of the selected papers studying participation in cultural heritage use either vague terms, such as “public” [77], “stakeholders” [72], or “society” [80], or precise group descriptions such as “indigenous people” [69] or “municipality” [82] to describe participants. However, most papers studying participation in cultural heritage describing “collective” or “group” participants acting together more than “individual” participants follow categorization according to age or social activities. Results of participation actors in sub-search A and participation actors in sub-searches B and C can be seen in Appendix B, Table A3: Charting participation actors: who participates?

These first results allowed us to pre-categorize actors of participation into three groups: social actors, political actors, and financial actors. Although our study was designed to identify the main actors in the papers we selected in this literature review, mainly (but not only) social actors in sub-search A, sub-searches B and C brought into consideration the two other types of actors: political and financial actors. The category of political actors can include actors who have political power and the legitimacy of representation to make decisions. In the results, these are outlined as stakeholders and municipalities. In our analysis, the designation we use is central and regional governments. The category of
financial actors includes the actors of funding who have the financial resources to fund projects and influence decisions. In the results, these are outlined as GLAM institutions (Galleries Libraries Archives and Museums). In our analysis, the designation we use is national and international nongovernmental funders. The category of social actors includes actors such as temporary and permanent inhabitants, and they can be organized as individuals or as groups, with or without legal status, and without the roles of the financial or the political actors. In the results, they are outlined as citizens and communities. In our analysis, the designations we use are permanent and temporary inhabitants.

In parallel, among the different groups of actors, there are experts with scientific and technical knowledge who we call scientific actors in our analysis. This category includes the actors who maintain knowledge for cultural heritage, such as researchers and universities for their scientific knowledge and architects for their technical knowledge. Scientific and technical actors can be part of one or two of the main groups of actors.

In Figure 2, we represent the four categories of actors, and we identify the actors at the intersections of two categories. Not representing the scientific actors in the same way as the three other categories does not mean that it is considered a sub-category, but rather that the scientific actors category exists organically within the three other categories.

![Diagram of actor categories]

**Figure 2.** Pre-categorization of actors of participation.

4. Discussion

Although it is more frequent in academic studies to define participation by its dimension, it remains controversial for two reasons. The first reason is the ambiguity between social participation and political participation. Indeed, the definition of social and political participation is the result of two different academic positions. The first position is “Political participation is a form of social participation”. Political participation involves decision making in social groups and the distribution of resources [83]. These decisions are services rendered by certain groups (e.g., political parties) or by individuals alone in a collective context. In addition to time and special skills, additional resources such as social knowledge and social skills are shared [84]. The second position is “political participation as a different form of social participation”. This scientific positioning is rather more recent than the previous positioning [19].

Although participation is a dynamic process between several actors, this process is characterized by the dimension, the actors, the approach, and the context it entails. This is
the reason for which we emphasize that defining participation by approach brings more elements of detail to the definition itself. We define participation as the broad term that includes all the participatory approaches with different levels of (non)inclusivity of different actors. We consider that the more that participation is based on an inclusive approach, the more that the actors feel included and collaborate actively within the framework of collective activity. In regard to the context, which can be temporal or spatial, it depends on every case study.

About participation actors, the research disagreement of whether to consider political participation as a form of social participation can influence our pre-categorization of actors by making the boundaries between categories more ambiguous, especially in regard to scientific actors and other actors at the intersections of categories. To avoid this ambiguity and to propose a more developed categorization, we suggest addressing the subject of actors from a different perspective: legitimacy. Our choice of legitimacy to address the subject of actors of participation is based on (1) the definition of legitimacy by Suchman [85] as “the community’s perception that an actor’s actions will be acceptable and useful for the community” and (2) the definition of an actor’s capacity to interact by Battilana et al. [86] as “the capacity for an actor to interact with other members of the ecosystem depends on the actor’s acknowledged legitimacy within the ecosystem itself”. The two definitions of legitimacy allow us to evaluate the kind of legitimacy that each actor of participation has, in general, and that each actor of participation in cultural heritage has, in particular. Financial actors and political actors can be classified together as actors who have legitimacy by the action. Since they are the actors who have political and financial power, the actions that financial actors and political actors take are acceptable by the rest of the actors, which makes these two categories actors by action. Regarding cultural heritage, actors by action are those who are most likely to change (or not) the material situation(s) of the cultural heritage. Concerning social actors, their legitimacy comes from knowing their immediate context. Since they are the actors who live in the context of the question, they are acceptable by the rest of the actors for knowing their environment. As to cultural heritage, actors by knowing are those who are most likely to have non-institutional knowledge or to take non-institutional action on the cultural heritage. The experts form together another type of actor, whose legitimacy comes from expertise, or knowledge, whether it is technical or scientific. Their expertise, because it is institutional, is acceptable by the rest of the actors. In cultural heritage, actors by knowledge are those who have institutional knowledge and are allowed to take institutional action, if allied to the actors by action, in the cultural heritage.

In the following Figure 3, we reorganize the actors into three different groups according to the legitimacy they have. This serves later to draw the participation challenges.

![Figure 3. Categorization of actors of participation.](image-url)
Challenges of Participation: How Are Participation Actors Interacting?

Challenges of participation are commonly addressed in academic studies according to the discipline of study. In cultural heritage, since participation is recent in application, there are fewer studies than other disciplines about the challenges of participation. Based on the crucial roles that actors of participation play, we base our definition of the challenges of participation on the challenges faced by actors when they interact. In this section, we present the challenges of participation based on our ‘How’ question, then we focus on the recurrence of participation challenges in cultural heritage.

As we mentioned in the method, we chose papers in both multidisciplinary fields (sub-search A) and cultural heritage (sub-searches B and C). Therefore, it was often difficult to spot common categories of participants. It was, however, possible to see clear types of connections that relate to participants who are frequently mentioned in studies about social participation and in studies about participation in cultural heritage. Based on the findings on RQ2 and the definition of an actor’s capacity to interact [86], we deduced the following interactions between the actors, as represented in Figure 4 below.

![Figure 4. Interactions between actors of participation.](image)

In the dynamic between these actors, it is remarkable that interactions between actors by action and actors by knowledge are frequent. These interactions take place through representation and governance processes. Regarding interactions between actors by action and actors by knowledge, they are also frequent, through spaces and territories planning processes. The third possible interaction, between actors by knowing and actors by knowledge, is less frequent than other interactions. This interaction most likely takes place during research projects based on academic and scientific collaborations.

Therefore, these three interactions are mainly based on two axes: democracy and science. Representation and governance processes interactions can be described as democracy interactions between the actors by knowing and the actors by action. Research projects within academic and scientific collaborations can be described as science interactions between the actors by knowledge and the actors by knowing. Finally, spaces and territories planning processes can be described as both democracy and science interactions between the actors by knowledge and the actors by action.

Hence, the main challenges regarding participation in general, and to participation in cultural heritage in particular, take two forms: democracy and science. That is, we acknowl-
edge the existence of two main challenges: the democratic challenge and the scientific challenge. First, the democratic challenge is present in the interactions requiring participation in democratic practices, mainly in the representation and governance processes and partially in the spaces and territories planning processes. In this challenge, the most legitimate actors are actors by action, then actors by knowledge, and then actors by knowing. The democratic challenge is to consider that the non-institutional actions of the actors by knowing are as acceptable and useful for the community as the other actors’ actions. The scientific challenge is present in the interactions requiring participation in science practices, mainly in research projects, and partially in the spaces and territories planning processes. In this challenge, it is more likely in society today to consider that the most legitimate actors are actors by knowledge, then actors by action, and then actors by knowing. The scientific challenge is to consider that the non-institutional knowledge of the actors by knowing is as acceptable and useful for the community as the other actors’ knowledge.

In sub-search A, among 61 papers selected, only 5 studies were connected to the scientific challenge of participation [9,10,29,41,49], whereas in sub-search B and sub-search C, a significant number of the papers selected underline the scientific challenge as the key challenge in the cultural heritage studies selected for this literature review. Out of a total number of 16 papers, scientific challenge is present in 6 studies together with democratic challenge and in 9 studies as the main challenge. The democratic challenge is only underlined in 1 study, as explained in the Table 2 below (charted in Appendix B, Table A4: Charting Challenges of Participation).

Table 2. Number of studies linked to democratic challenge and scientific challenge in sub-search B and sub-search C.

| Scientific Challenge + Democratic Challenge | Scientific Challenge Only | Democratic Challenge Only |
|-------------------------------------------|--------------------------|--------------------------|
| [70,74,75,80–82]                          | [67–69,71–73,77–79]      | [76]                     |

5. Conclusions

This article provides an in-depth study of the definition, actors, and challenges of participation with a focus on cultural heritage through a systematic literature review. The results of our study define participation as the broad term that includes all participatory approaches with different levels of (non)inclusivity. The different actors included in participation are actors by action, actors by knowing, and actors by knowledge. This review indicates that the challenges facing participation can be classified as scientific challenges and democratic challenges based on the interactions between actors. Since participation in cultural heritage is in an early stage of adoption, considerable effort is needed to tackle the challenges it faces. There remains work to be conducted in assessing the adequate methodologies for participation in the cultural heritage sector.

There were, of course, some limitations to this study, mainly in the data collection phase. The PRISMA tool has two significant positive and negative aspects. It allows to guarantee the scientific rigor needed to conduct systematic reviews, but at the same time, it can minimize the number of papers in research and make reviewers either content with a small number of papers or include papers with a broader scope under a methodological selection. Thus, we chose to study mainly scientific articles only in the Scopus database (without year filter) and on the Google Scholar database (only the last two years) while conducting keyword searches only in papers’ titles. This automatically excluded other scientific papers in the field of cultural heritage which do not use the term “participation” in their titles. This strategy helps to limit the total number of papers to be reviewed; regardless, it opens paths for improvement by extending the search to abstracts and keywords suggested in all available papers. Including other keywords and databases could bring more detailed results, as well as continuing the work with the other questions of the 5Ws + 1H method.
Since it is important to focus on the question of the scientific challenge in cultural heritage, our future work is to focus on (1) analyzing different study cases to select the approach that can serve better participation in cultural heritage from a scientific challenge angle, such as collaborative research-action, and (2) to validate the role of Information and Communication Technologies (ICT) in participation in cultural heritage, since they have been giving growing support to participation in cultural heritage and exploitation for the last few decades [87].

**Author Contributions:** Funding acquisition, S.B.R.; Methodology, K.S.; Supervision, S.B.R.; Writing—review & editing, K.S. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research was supported by Wallonie-Bruxelles International (https://www.wbi.be) as part of doctoral grant (SUB/2020/488312).

**Conflicts of Interest:** The authors declare no conflict of interest.

**Appendix A Boolean Search of the Electronic Databases**
Sub search A (Scopus)
TITLE (participation)
AND (LIMIT-TO (SRCTYPE, “j”))
AND (LIMIT-TO (OA, “all”))
AND (LIMIT-TO (PUBSTAGE, “final”))
AND (LIMIT-TO (SUBJAREA, “MULT”))
AND (LIMIT-TO (DOCTYPE, “ar”))
AND (LIMIT-TO (LANGUAGE, “English”))
AND (LIMIT-TO (EXACTKEYWORD, “Social Participation”))

Sub search B (Scopus)
TITLE (participation cultural heritage)
AND (LIMIT-TO (OA, “all”))
AND (LIMIT-TO (DOCTYPE, “ar”))

Sub search C (Google Scholar)
Allintitle: participation cultural heritage.

We selected the published papers available in open acces in the last two years (2020 + 2021).

**Appendix B Tables of Results Charting**

| Reference | Authors | Participation in Question |
|-----------|---------|-------------------------|
| [6]       | Spaaij, R.; Lusher, D.; Jeanes, R.; Farquharson, K.; Gorman, S.; Magee, J. | Participation |
| [7]       | Anastasopoulos, L.; Williams, J. | Participation |
| [8]       | Törnbom, K.; Lundälv, J.; Sunnerhagen, K. | Political participation |
| [9]       | Sartas, M.; van Asten, P.; Schut, M.; McCampbell, M.; Awori, M.; Muchunguzi, P.; Tonywa, M.; Namazzi, S.; Sole Amat, A.; Thiele, G.; Proietti, C.; Devaux, A.; Leeuwis, C. | Participation |
| [10]      | Marsango, D.; Hansen, T.; Polanczyk, C.; Santos, R. | Participation |
| [11]      | Tarimo, E.; Ambikile, J.; Munseri, P.; Bakari, M. | Participation |
| [12]      | Ejiri, M.; Kawai, H.; Fujiwara, Y.; Ibara, K.; Watanabe, Y.; Hirano, H.; Kim, H.; Ishii, K.; Oka, K.; Obuchi, S. | Social participation |
| [13]      | Jin, S.; Trope, G.; Buys, Y.; Badley, E.; Thavorn, K.; Yan, P.; Nithianandan, H.; Jin, Y. | Social participation |
| [14]      | Maciver, D.; Rutherford, M.; Arakelyan, S.; Kramer, J.; Richmond, J.; Todorova, L.; Romero-Ayuso, D.; Nakamura-Thomas, H.; ten Velden, M.; Finlayson, I.; O’Hare, A.; Forsyth, K. | Involvement in life situations |
**Table A1. Cont.**

| Reference | Authors                                                                 | Participation in Question |
|-----------|-------------------------------------------------------------------------|---------------------------|
| [15]      | Ørjasæter, K.; Davidson, L.; Hedlund, M.; Bjerkeset, O.; Ness, O.        | Participation             |
| [16]      | Albers, W.; Roeg, D.; Nijssen, Y.; van Weeghel, J.; Bongers, I.         | Social participation      |
| [17]      | Tomioka, K.; Kurumatani, N.; Saeki, K.                                  | Social participation      |
| [18]      | Nyasani, D.; Muitua, G.; Sajabi, R.; Ng’ang’a, J.; Gachie, J.; Maina, A.; | Participation             |
| [19]      | Lusike, L.; Anzala, A.; Price, M.; Manyomyi, G.                         | Participation             |
| [20]      | Kornadt, A.; Hufer, A.; Kandler, C.; Riemann, R.                       | Political participation   |
| [21]      | Dougall, A.; Martinez Pereira, F.; Molina, G.; Eschevins, C.; Daly, B.; Faulks, D. | Participation             |
| [22]      | De Wet, N.; Somefun, O.; Rambau, N.                                     | Social activities participation |
| [23]      | Katagiri, K.; Kim, J.; Protière, C.; Spire, B.; Mora, M.; Poizot-Martin, I.; Préau, M.; Doumergue, M.; Morlat, P.; Zucman, D.; Lamotte, O.; Suzan-Monti, M. | Social participation |
| [24]      | Amagasa, S.; Fukushima, N.; Kikuchi, H.; Oka, K.; Takamiya, Y.; Odagiri, Y.; Inoue, S. | Social participation |
| [25]      | Chu, C.; Liu, J.; Chen, S.; Jin, J.; Shi, L.                            | Voluntary participation   |
| [26]      | Dal Grande, E.; Chittleborough, C.; Campostrini, S.; Dollard, M.; Taylor, A. | Participation             |
| [27]      | Thompson, M.; Elliott, C.; Willis, C.; Ward, R.; Falkmer, M.; Falkmer, T. | Community participation   |
| [28]      | Gubbay, A.; Girdler, S.                                                | Participation             |
| [29]      | Mair, P.; Hofmann, E.; Gruber, K.; Hatzinger, R.; Zeileis, A.; Hornik, K. | Participation             |
| [30]      | Arundell, L.; Hinkley, T.; Veitch, J.; Salmon, J.                       | Daily participation       |
| [31]      | Yamakita, M.; Kanamori, S.; Kondo, K.                                  | Social participation      |
| [32]      | Tomioka, K.; Kurumatani, N.; Hosoi, H.                                 | Participation             |
| [33]      | Hebert, J.; Moller, N.; Andersen, L.; Wedderkopp, N.                    | Social participation      |
| [34]      | Hancock, K.; Cunningham, N.; Lawrence, D.; Zarb, D.; Zubrick, S.        | Social support            |
| [35]      | Rob, H.; Hong, C.; Lee, Y.; Oh, B.; Lee, K.; Chang, K.; Kang, D.; Kim, J.; Lee, S.; Back, J.; Chung, Y.; Lim, K.; Noh, J.; Kim, D.; Son, S. | Social activities participation |
| [36]      | Witvorapong, N.; Muttarak, R.; Pothisiri, W.                           | Social participation      |
| [37]      | Bender, A.; Kawachi, I.; Jørgensen, T.; Pisinger, C.                   | Participation             |
| [38]      | Vaz, S.; Cordier, R.; Falkmer, M.; Ciccarelli, M.; Parsons, R.; McAuliffe, T.; Falkmer, T. | Participation             |
| [39]      | Dasgupta, N.; Scircle, M.; Hunsinger, M.                               | Participation             |
| [40]      | Ballister, R.; Huertas, F.; Yuste, F.; Llorens, F.; Sanabria, D.       | Participation             |
| [41]      | Khatri, C.; Chapman, S.; Glasbey, J.; Kelly, M.; Nepogodiev, D.; Bhangu, A.; Fitzgerald, J. | Collaborative engagement and participation |
| [42]      | Goll, J.; Charlesworth, G.; Scior, K.; Stott, J.                       | Participation             |
| [43]      | Forcey, D.; Walker, S.; Vodstrcil, L.; Fairley, C.; Bilardi, J.; Law, M.; Hocking, J.; Fethers, K.; Petersen, S.; Bellhouse, C.; Chen, M.; Bradshaw, C. | Social activities participation |
| [44]      | Foley, K.; Girdler, S.; Bourke, J.; Jacoby, P.; Llewellyn, G.; Einfeld, S.; Tonge, B.; Parmenter, T.; Leonard, H. | Participation             |
| [45]      | Nakamura, M.; Yokoyama, A.                                             | Participation in group    |
| [46]      | Kelly, J.; Stout, R.; Greene, M.; Slaymaker, V.                        | Participation             |
| [47]      | Kanamori, S.; Sai, Y.; Aida, J.; Kondo, K.; Kawachi, I.; Hirai, H.; Shirai, K.; Ishikawa, Y.; Suzuki, K. | Social participation |
| [48]      | Martin, K.; Cooper, R.; Harris, T.; Brage, S.; Hardy, R.; Kuh, D.       | Participation             |
| [49]      | Nov, O.; Arazzy, O.; Anderson, D.                                      | Social participation      |
| [50]      | Reimers, A.; Wagner, M.; Alvanides, S.; Steinmayr, A.; Reiner, M.; Schmidt, S.; Woll, A. | Participation             |
| [51]      | Seidel, U.; Gronewold, J.; Volsek, M.; Todica, O.; Kribben, A.; Bruck, H.; Hermann, D. | Social participation |
| [52]      | Fonner, V.; Kerrigan, D.; Mnisi, Z.; Ketende, S.; Kennedy, C.; Baral, S. | Social participation      |
| [53]      | Gustafsson, K.; Aronsson, G.; Marklund, S.; Wikman, A.; Floderus, B.    | Societal participation    |
| [54]      | Lund, T.; Andersen, J.; Winding, T.; Biering, K.; Labriola, M.          | Participation             |
| [55]      | Takeuchi, K.; Aida, J.; Kondo, K.; Osaka, K.                           | Social participation      |
| [56]      | Tewari, S.; Khan, S.; Hopkins, N.; Srinivasan, N.; Reicher, S.          | Participation             |
| [57]      | Saias, T.; Beck, F.; Bodard, J.; Guignard, R.; du Roscoat, E.           | Community participation   |
| [58]      | Shattuck, P.; Ormond, G.; Wagner, M.; Cooper, B.                       | Social participation      |
Table A1. Cont.

| Reference | Authors | Participation in Question |
|-----------|---------|---------------------------|
| [59]      | Anggraeni, L. | Social participation |
| [60]      | Rueda-Salazar, S.; Spijker, J.; Devolder, D.; Albala, C. | Social participation |
| [61]      | de Oliveira, T.; Felicio, D.; Filho, J.; Durigan, J.; Fonseca, D.; José, A.; Oliveira, C.; Malaguti, C. | Social participation |
| [62]      | Abe, T.; Okuyama, K.; Kamada, M.; Yano, S.; Toyama, Y.; Isomura, M.; | Social participation |
| [63]      | Wang, H.; He, Y.; Shi, L.; Wang, J.; Miao, L.; Dai, J. | Social participation |
| [64]      | Tomioka, K.; Kurumatani, N.; Saeki, K. | Participation |
| [65]      | Kelly-Hanku, A.; Redman-MacLaren, M.; Boli-Neo, R.; Nosí, S.; Ase, S.; Aeno, N.; Nembari, J.; Amos, A.; Gabuzzi, J.; Kupul, M.; Williie, B.; Narakobi, R.; Hou, P.; Pekon, S.; Kaldor, J.; Badman, S.; Vallety, A.; Hakim, A. | Participation |
| [66]      |Coussens, M.; Destoop, B.; De Baets, S.; Desoete, A.; Oostra, A.; Vanderstraeten, G.; Van Waalvelde, H.; Van de Velde, D. | Participation |
| [67]      | Davis, E.; Heravi, B. | Civic participation |
| [68]      | Yan, W.; Chiou, S. | participation in the creation of intangible cultural heritage (ICH) and ultimately cultural life |
| [69]      | Eichler, J. | Community participation |
| [70]      | Borlottotto, C.; Demgenski, P.; Karampampas, P.; Toji, S. | Community participation |
| [71]      | Li, J.; Krishnamurthy, S.; Pereira Roders, A.; van Wesemael, P. | Community participation |
| [72]      | Li, J.; Krishnamurthry, S.; Pereira Roders, A.; van Wesemael, P. | Community participation |
| [73]      |Seitsonen, O. | User-community participation |
| [74]      | Jett, J.; Senseney, M.; Palmer, C. | Participation |
| [75]      | Nasrolahi A.; Messina V, Gena C. | Public participation |
| [76]      | Solovyanenko, N. | Citizens participation |
| [77]      | Guo, Y.; Wang, Y. | Public participation |
| [78]      | Stendardi, D.; Perez, E; Castillo, A. and Garcia, J. I. | Citizen participation |
| [79]      | Borges, L. C.; Alvim, L. and Silva, A. | Collective participation |
| [80]      | Wahanisa, R.; Niravit, A.; Nissak, W. | Public Participation |
| [81]      | Leite, C.; Acosta, C.; Militelli, E; Jajamovich, G.; Wilderom, M.; Bonduki, N.; Somekh, N.; Herling, T. | Participation and social inclusion |
| [82]      | Joshi Shrestha, R.J, Tripti Twayana, T. and Rajbanshi, E. | Active community participation |

Table A2. Classification of the common terms used for participation in 4 groups according to dimension, actors, context, and approach.

| What Participation? | Number of Papers |
|---------------------|------------------|
| Citizens participation | 3 |
| Civic participation | 1 |
| Collective participation | 1 |
| Community participation | 7 |
| Participation in group | 1 |
| Public Participation | 3 |
| User-community participation | 1 |
| Collaborative engagement and participation | 1 |
| Voluntary participation | 1 |
| Daily participation | 1 |
| Participation and social inclusion | 1 |
| Political participation | 2 |
| Social activities participation | 2 |
| Social participation | 21 |
| Social support | 1 |
| Societal participation | 1 |
| Reference | Authors | Participation in Question |
|-----------|---------|--------------------------|
| [6]       | Spaaij, R.; Lusher, D.; Jeanes, R.; Farquharson, K.; Gorman, S.; Magee, J. | Children |
| [7]       | Anastasopoulou, L.; Williams, J. | Citizens |
| [8]       | Törnbom, K.; Lundåv, J.; Sunnerhagen, K. | Adults |
| [9]       | Sartas, M.; van Asten, P.; Schut, M.; McCampbell, M.; Awori, M.; Muchunguzi, P.; Tenywa, M.; Namazzi, S.; Sole Amat, A.; Thiele, G.; Proietti, C.; Devaux, A.; Leeuwis, C. | Multistakeholders |
| [10]      | Marsango, D.; Hansen, T.; Polanczyk, C.; Santos, R. | Citizens |
| [11]      | Tarimo, E.; Ambikile, J.; Munseri, P.; Bakari, M. | Citizens |
| [12]      | Ejiri, M.; Kawai, H.; Fujivara, Y.; Ihara, K.; Watanabe, Y.; Hirano, H.; Kim, H.; Ishii, K.; Oka, K.; Obuchi, S.; Jin, S.; Trope, G.; Buys, Y.; Badley, E.; Thavorn, K.; Yan, P.; Nithianandan, H.; Jin, Y. | Older people |
| [13]      | Maciver, D.; Rutherford, M.; Arakelyan, S.; Kramer, J.; Richmond, J.; Todorova, L.; Romero-Ayuso, D.; Nakamura-Thomas, H.; ten Velden, M.; Finlayson, I.; O’Hare, A.; Forsyth, K. | Older people |
| [14]      | Ørjasæter, K.; Davidson, L.; Hedlund, M.; Bjerkeset, O.; Ness, O.; Albers, W.; Roeg, D.; Nijsen, Y.; van Weeghel, J.; Bongers, I; Tomioka, K.; Kurumatani, N.; Saeki, K. | Older people |
| [15]      | Nysani, D.; Mutua, G.; Saabji, R.; Ng’ang’a, J.; Gachie, J.; Maina, A.; Lusike, L.; Anzala, A.; Price, M.; Manyonyi, G.; Kornadt, A.; Hufer, A.; Kandler, C.; Riemann, R. | Older people |
| [16]      | Bou, T.; Morlat, P.; Goujard, C.; Raffi, F.; Lambotte, O.; Suzan-Monti, M. | Older people |
| [17]      | Amagasa, S.; Fukushima, N.; Kikuchi, H.; Oka, K.; Takamiya, T.; Odagiri, Y.; Inoue, S. | Older people |
| [18]      | Chu, C.; Liu, J.; Shen, C.; Jin, J.; Shi, L. | Older people |
| [19]      | Dal Grande, E.; Chittleborough, C.; Campostrini, S.; Dollard, M.; Taylor, A.; Thompson, M.; Elliott, C.; Willis, C.; Ward, R.; Falkmer, M.; Falkmer, T.; Gubbay, A.; Girdler, S. | Older people |
| [20]      | Singam, A.; Ytterberg, C.; Tham, K.; von Koch, L. | Older people |
| [21]      | Mair, P.; Hofmann, E.; Gruber, K.; Hatzinger, R.; Zeileis, A.; Hornik, K. | Older people |
| [22]      | Arundell, L.; Hinkley, T.; Veitch, J.; Salmon, J. | Older people |
| [23]      | Yamakita, M.; Kanamori, S.; Kondo, N.; Kondo, K. | Older people |
| [24]      | Tomioka, K.; Kurumatani, N.; Hosoi, H. | Older people |
| [25]      | Hebert, D.; Moller, N.; Andersen, L.; Weidnerkopp, N. | Older people |
| [26]      | Hancock, K.; Cunningham, N.; Lawrence, D.; Zarb, D.; Zubrick, S. | Older people |
| [27]      | Roh, H.; Hong, C.; Lee, Y.; Oh, B.; Lee, K.; Chang, K.; Kang, D.; Kim, J.; Lee, S.; Back, J.; Chung, Y.; Lim, K.; Noh, J.; Kim, D.; Son, S. | Older people |
| [28]      | Witvorapong, N.; Muttararak, R.; Pothisiri, W. | Older people |
| [29]      | Bender, A.; Kawachi, I.; Jørgensen, T.; Pisinger, C. | Older people |
| [30]      | Vaz, S.; Cordier, R.; Falkmer, M.; Ciccarelli, M.; Parsons, R.; McAuliffe, T.; Falkmer, T. | Older people |
| [31]      | Dasgupta, N.; Scircle, M.; Hunsinger, M. | Older people |
| [32]      | Ballester, R.; Huertas, F.; Yuete, F.; Llorens, F.; Sanabria, D. | Older people |
| [33]      | Khatri, C.; Chapman, S.; Glasbey, J.; Kelly, M.; Nepogodiev, D.; Bhangu, A.; Fitzgerald, J. | Older people |
| [34]      | Goll, J.; Charlesworth, G.; Scior, K.; Stott, J. | Older people |
| [35]      | Forcey, D.; Walker, S.; Vodstrcil, L.; Fairley, C.; Bilardi, J.; Law, M.; Hocking, J.; Fethers, K.; Petersen, S.; Bellhouse, C.; Chen, M.; Bradshaw, C. | Older people |
| [36]      | Foley, K.; Girdler, S.; Bourke, J.; Jacoby, P.; Llewellyn, G.; Einfeld, S.; Tonge, B.; Parmenter, T.; Leonard, H. | Older people |
| [37]      | Nakamura, M.; Yokoyama, A. | Older people |
| [38]      | Kelly, J.; Stout, R.; Greene, M.; Slaymaker, V. | Older people |
| Reference | Authors | Participation in Question |
|-----------|---------|---------------------------|
| [47]      | Kanamori, S.; Kai, Y.; Aida, J.; Kondo, K.; Kawachi, I.; Hirai, H.; Shirai, K.; Ishikawa, Y.; Suzuki, K. | Older people |
| [48]      | Martin, K.; Cooper, R.; Harris, T.; Brage, S.; Hardy, R.; Kuh, D. | Older people |
| [49]      | Nov, O.; Arazy, O.; Anderson, D. | Citizens |
| [50]      | Reimers, A.; Wagner, M.; Alvanides, S.; Steinmayer, A.; Reiner, M.; Schmidt, S.; Woll, A. | Adolescents |
| [51]      | Seidel, U.; Gronewold, J.; Volsek, M.; Todica, O.; Kribben, A.; Bruck, H.; Hermann, D. | Patients |
| [52]      | Fonner, V.; Kerrigan, D.; Mnisi, Z.; Ketende, S.; Kennedy, C.; Baral, S. | Individuals or groups based on their sexual life |
| [53]      | Gustafsson, K.; Aronsson, G.; Marklund, S.; Wikman, A.; Floderus, B. | Adults |
| [54]      | Lund, T.; Andersen, J.; Widing, T.; Biering, K.; Labriola, M. | Adults |
| [55]      | Takeuchi, K.; Aida, J.; Kondo, K.; Osaka, K. | Older people |
| [56]      | Tewari, S.; Khan, S.; Hopkins, N.; Srinivasan, N.; Reicher, S. | Participants in Mass Gatherings |
| [57]      | Saïas, T.; Beck, F.; Bodard, J.; Guignard, R.; du Roscoät, E. | Older people |
| [58]      | Shattuck, P.; Orsmond, G.; Wagner, M.; Cooper, B. | Adolescents |
| [59]      | Angnraeni, L. | Households and parents |
| [60]      | Rue-da-Salazar, S.; Spijker, J.; Devolder, D.; Albala, C. | Older people |
| [61]      | de Oliveira, T.; Felicio, D.; Filho, J.; Durigan, J.; Fonseca, D.; José, A.; Oliveira, C.; Malaguti, C. | Older people |
| [62]      | Abe, T.; Okuyama, K.; Kamada, M.; Yano, S.; Toyama, Y.; Isomura, M.; Nabika, T.; Sakane, N.; Ando, H.; Miyazaki, R. | Older people |
| [63]      | Wang, H.; He, Y.; Shi, L.; Wang, J.; Miao, L.; Dai, J. | Individuals based on their profession |
| [64]      | Tomioka, K.; Kurumatani, N.; Saeki, K. | Older people |
| [65]      | Kelly-Hanku, A.; Redman-MacLaren, M.; Boli-Neo, R.; Nosi, S.; Ase, S.; Aene, H.; Nembari, J.; Amos, A.; Gabuzzi, J.; Kupul, M.; Willlie, B.; Narokobi, R.; Hou, P.; Pekon, S.; Kaldor, J.; Badman, S.; Valley, A.; Hakim, A. | Individuals or groups based on their sexual life |
| [66]      | Coussens, M.; Destoop, B.; De Baets, S.; Desoete, A.; Oostra, A.; Vanderstraeten, G.; Van Waelvelde, H.; Van de Velde, D. | Children |
| [67]      | Davis, E.; Heravi, B. | GLAM |
| [68]      | Yan, W.; Chiou, S. | Citizens |
| [69]      | Eichler, J. | Indigenous peoples |
| [70]      | Bortolotto, C.; Demgenski, P.; Karampampas, P.; Toji, S. | Community |
| [71]      | Li, J.; Krishnamurthy, S.; Pereira Roders, A.; van Wesemael, P. | Community |
| [72]      | Li, J.; Krishnamurthy, S.; Pereira Roders, A.; van Wesemael, P. | Stakeholders |
| [73]      | Seitsonen, O. | Users |
| [74]      | Jett, J.; Senseney, M.; Palmer, C. | Users |
| [75]      | Nasrolabi A.; Messina V, Gena C. | Community |
| [76]      | Solovyandenko, N. | Citizens |
| [77]      | Guo, Y.; Wang, Y. | Public |
| [78]      | Stendardi, D.; Perez, E.; Castillo, A. and Garcia, J. I. | Community |
| [79]      | Borges, L. C.; Alvim, L. and Silva, A. | GLAM |
| [80]      | Wahanisa, R.; Niravita, A.; Nissak, W. | Society |
| [81]      | Leite, C.; Acosta, C.; Militelli, F.; Jajamovich, G.; Wilderom, M.; Bonduki, N.; Somekh, N.; Herling, T. | Community |
| [82]      | Joshi Shrestha, R.J, Tripti Twayana, T. and Rajbanshi, E. | Municipality |
Table A4. Charting Challenges of Participation.

| Reference | Authors | Democratic Challenge | Scientific Challenge |
|-----------|---------|----------------------|----------------------|
| [6]       | Spaaij, R.; Lusher, D.; Jeanes, R.; Farquharson, K.; Gorman, S.; Magee, J. | X | |
| [7]       | Anastasopoulos, L.; Williams, J. | X | |
| [8]       | Törnbom, K.; Lundālv, J.; Sunnerhagen, K. | X | |
| [9]       | Sartas, M.; van Asten, P.; Schut, M.; McCampbell, M.; Awori, M.; Muchunguzi, P.; Tenywa, M.; Namazzi, S.; Sore Amat, A.; Thiele, G.; Proietti, C.; Devaux, A.; Leeuwis, C. | X | |
| [10]      | Marsango, D.; Hansen, T.; Polanczyk, C.; Santos, R. | X | |
| [11]      | Tarimo, E.; Ambikile, J.; Munseri, P.; Baxi, M. | X | |
| [12]      | Eijiri, M.; Kawai, H.; Fujiwara, Y.; Ibarra, K.; Watanabe, Y.; Hirano, H.; Kim, H.; Ishii, K.; Oka, K.; Obuchi, S. | X | |
| [13]      | Jin, S.; Trope, G.; Buys, Y.; Badley, E.; Thavorn, K.; Yan, P.; Nithianandan, H.; Jin, Y. | X | |
| [14]      | Maciver, D.; Rutherford, M.; Arakelyan, S.; Kramer, J.; Richmond, J.; Todorovia, L.; Romero-Ayuso, D.; Nakamura-Thomas, H.; ten Velden, M.; Finlayson, I.; O’Hare, A.; Forsyth, K. | X | |
| [15]      | Ørjasæter, K.; Davidson, L.; Hedlund, M.; Bjorkset, O.; Ness, O. | X | |
| [16]      | Albers, W.; Roeg, D.; Nijsen, Y.; van Weeghel, J.; Bongers, I. | X | |
| [17]      | Tomioka, K.; Kurumatani, N.; Saeki, K. | X | |
| [18]      | Nyasani, D.; Mutua, G.; Sabaji, R.; Ng’ang’a, J.; Gachie, J.; Maina, A.; Lusike, L.; Anzala, A.; Price, M.; Manyonyi, G. | X | |
| [19]      | Kornadt, A.; Hufer, A.; Kandler, C.; Riemann, R. | X | |
| [20]      | Dougall, A.; Martinez Pereira, E.; Molina, G.; Eschevins, C.; Daly, B.; Faulks, D. | X | |
| [21]      | De Wet, N.; Somefun, O.; Rambau, N. | X | |
| [22]      | Katagiri, K.; Kim, J. | X | |
| [23]      | Protière, C.; Spire, B.; Mora, M.; Poizot-Martin, I.; Préau, M.; Doumergue, M.; Morlat, P.; Zucman, D.; Goujard, C.; Raffi, F.; Lambotte, O.; Suzan-Monti, M. | X | |
| [24]      | Amagasa, S.; Fukushima, N.; Kikuchi, H.; Oka, K.; Takamaya, T.; Odagiri, Y.; Inoue, S. | X | |
| [25]      | Chu, C.; Liu, J.; Chen, C.; Jin, J.; Shi, L. | X | |
| [26]      | Dal Grande, E.; Chittleborough, C.; Campanini, D.; Dollard, M.; Taylor, A. | X | |
| [27]      | Thompson, M.; Elliott, C.; Willis, C.; Ward, R.; Falkmer, M.; Falkmer, T.; Gubbay, A.; Girdler, S. | X | |
| [28]      | Singam, A.; Ytterberg, C.; Thom, K.; von Koch, L. | X | |
| [29]      | Mair, P.; Hofmann, E.; Gruber, K.; Hatzinger, R.; Zeileis, A.; Hornik, K. | X | |
| [30]      | Arundell, L.; Hinkle, T.; Veitch, J.; Salmon, J. | X | |
| [31]      | Yamakita, M.; Kanamori, S.; Kondo, N.; Kondo, K. | X | |
| [32]      | Tomioka, K.; Kurumatani, N.; Hosoi, H. | X | |
| [33]      | Hebert, J.; Møller, N.; Andersen, L.; Wedderkopp, N. | X | |
| [34]      | Hancock, K.; Cunningham, N.; Lawrence, D.; Zarb, D.; Zubrick, S. | X | |
| [35]      | Roh, H.; Hong, C.; Lee, Y.; Oh, B.; Lee, K.; Chang, K.; Kang, D.; Kim, J.; Lee, S.; Back, J.; Chung, Y.; Lim, K.; Noh, J.; Kim, D.; Son, S. | X | |
| [36]      | Witvorapong, N.; Muttararak, R.; Pothisiri, W. Social | X | |
| [37]      | Bender, A.; Kawachi, I.; Jørgensen, T.; Pisinger, C. | X | |
| [38]      | Vaz, S.; Cordier, R.; Falkmer, M.; Ciccarelli, M.; Parsons, R. | X | |
| [39]      | McAlliffe, T.; Falkmer, T. | X | |
| [40]      | Dasgupta, N.; Scircle, M.; Hunsinger, M. | X | |
| [41]      | Ballester, R.; Huertas, F.; Yuste, E.; Llorens, F.; Sanabria, D. | X | |
| [42]      | Khatri, C.; Chapman, S.; Glasbey, J.; Kelly, M.; Nepogodiev, D.; Bhangu, A.; Fitzgerald, J. | X | |
| [43]      | Goll, J.; Charlesworth, G.; Scior, K.; Stott, J. | X | |
| Reference | Authors | Democratic Challenge | Scientific Challenge |
|-----------|---------|----------------------|----------------------|
| [43]      | Forcey, D.; Walker, S.; Vodstrcil, L.; Fairley, C.; Bilardi, J.; Law, M.; Bradshaw, C. | X                     |                      |
| [44]      | Foley, K.; Girdler, S.; Bourke, J.; Jacoby, P.; Llewellyn, G.; Einfeld, S.; Tonge, B.; Parmenter, T.; Leonard, H. | X                     |                      |
| [45]      | Nakamaru, M.; Yokoyama, A. | X                     |                      |
| [46]      | Kelly, J.; Stout, R.; Greene, M.; Slaymaker, V. | X                     |                      |
| [47]      | Kanamori, S.; Kai, Y.; Aida, J.; Kondo, K.; Kawachi, I.; Hirai, H.; Shirai, K.; Ishikawa, Y.; Suzuki, K. | X                     |                      |
| [48]      | Martin, K.; Cooper, R.; Harris, T.; Brage, S.; Hardy, R.; Kuh, D. | X                     |                      |
| [49]      | Nov, O.; Arazy, O.; Anderson, D. |                      | X                     |
| [50]      | Reimers, A.; Wagner, M.; Alvanides, S.; Steinmayer, A.; Reiner, M.; Schmidt, S.; Woll, A. | X                     |                      |
| [51]      | Seidel, U.; Gronewold, J.; Volsek, M.; Todica, O.; Kribben, A.; Bruck, H.; Hermann, D. | X                     |                      |
| [52]      | Forner, V.; Kerrigan, D.; Mnisi, Z.; Ketende, S.; Kennedy, C.; Baral, S. | X                     |                      |
| [53]      | Gustafsson, K.; Aronsson, G.; Marklund, S.; Wikman, A.; Floderus, B. | X                     |                      |
| [54]      | Lund, T.; Andersen, J.; Winding, T.; Biering, K.; Labriola, M. | X                     |                      |
| [55]      | Takeuchi, K.; Aida, J.; Kondo, K.; Osaka, K. | X                     |                      |
| [56]      | Tewari, S.; Khan, S.; Hopkins, N.; Srinivasan, N.; Reicher, S. | X                     |                      |
| [57]      | Salas, T.; Beck, F.; Bodard, J.; Guignard, R.; du Roscoët, E. | X                     |                      |
| [58]      | Shattuck, P.; Orsmond, G.; Wagner, M.; Cooper, B. | X                     |                      |
| [59]      | Anggraeni, L. | X                     |                      |
| [60]      | Rueda-Salazar, S.; Spijker, J.; Devolder, D.; Albala, C. | X                     |                      |
| [61]      | de Oliveira, T.; Felicio, D.; Filho, J.; Durigan, J.; Fonseca, D.; Jose, A.; Oliveira, C.; Malaguti, C. | X                     |                      |
| [62]      | Abe, T.; Okuyama, K.; Kamada, M.; Yano, S.; Toyama, Y.; Isomura, M.; Nabika, T.; Sakane, N.; Ando, H.; Miyazaki, R. | X                     |                      |
| [63]      | Wang, H.; He, Y.; Shi, L.; Wang, J.; Miao, L.; Dai, J. | X                     |                      |
| [64]      | Tomioka, K.; Kurumatani, N.; Saeki, K. | X                     |                      |
| [65]      | Kelly-Hanku, A.; Redman-MacLaren, M.; Boli-Neo, R.; Nosi, S.; Ase, S.; Aenou, H.; Nembari, J.; Amos, A.; Gabuzzi, J.; Kupul, M.; Willie, B.; Narokobi, R.; Hou, P.; Pekon, S.; Kaldor, J.; Badman, S.; Vallely, A.; Hakim, A. | X                     |                      |
| [66]      | Coussens, M.; Destoop, B.; De Baets, S.; Desoete, A.; Oostra, A.; Vanderstraeten, G.; Van Waerbeke, H.; Van de Velde, D. | X                     |                      |
| [67]      | Davis, E.; Heravi, B. | X                     |                      |
| [68]      | Yan, W.; Chou, S. | X                     |                      |
| [69]      | Eichler, J. | X                     |                      |
| [70]      | Bortolotto, C.; Demgenski, P.; Karampampas, P.; Toji, S. | X                     |                      |
| [71]      | Li, J.; Krishnamurthy, S.; Pereira Rodgers, A.; van Wesemael, P. | X                     |                      |
| [72]      | Li, J.; Krishnamurthy, S.; Pereira Rodgers, A.; van Wesemael, P. | X                     |                      |
| [73]      | Seitsonen, O. | X                     |                      |
| [74]      | Jett, J.; Senseney, M.; Palmer, C. | X                     |                      |
| [75]      | Nasroahi A.; Messina V, Gena C. | X                     |                      |
| [76]      | Soloyvyanenko, N. | X                     |                      |
| [77]      | Guo, Y.; Wang, Y. | X                     |                      |
| [78]      | Stendardi, D.; Perez, E.; Castillo, A. and Garcia, J. I. | X                     |                      |
| [79]      | Borges, L. C.; Alvim, L. and Silva, A. | X                     |                      |
| [80]      | Wahanisa, R.; Niravita, A.; Nissak, W. | X                     |                      |
| [81]      | Leite, C.; Acosta, C.; Militelli, F.; Jajamovich, G.; Wilderom, M.; Bonduki, N.; Somekh, N.; Herling, T. | X                     |                      |
| [82]      | Joshi Shrestha, R.J; Tripti Taryawan, T. and Rajbanshi, E. | X                     |                      |
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