What a difference a workplace makes. A sciento-metric analysis on the relationship between job crafting and healthy organizations' factors
By Gemmano et al.

What a difference a workplace makes. A scientometric analysis on the relationship between job crafting and healthy organizations' factors

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Introduction: The transformations that have affected the labour market in recent years have required companies to adapt to fast changes and to keep the pace of global competition. Consequently, workers have been confronted with multiple challenging demands: they have been required to develop flexibility in their jobs and to work faster and better, often with evident costs in terms of performance and workplace their well-being. Given these evidence, as also shown by some of the most recent developments in the field of Positive Work and Organizational Psychology, healthy organizations are those organizations that could resist to these challenges, because they engage in creating an environment that can promote employees' health and safety, maximising performance. Yet, healthy organizations support positive organizational behaviors through a coherent culture, a positive climate, and good practices. Healthy organizations might also create the conditions to encourage workers to perform job crafting behaviors, meant as proactive individual behaviours aimed at modifying job demands in order to adjust them to personal needs, motivations and talents, thus maximising well-being and performance.
Objective: The aim of the study was to overview the state of the art of the debate about the relationship between job crafting and healthy organizations' factors by performing a scientometric analysis of job crafting. Therefore, the

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study was aimed to emphasize performances of countries, journals and authors, highlighting the dominant perspectives on the topic.

Method: The starting point of the analysis was data recovery from the Scopus database using the term "job crafting" as search criterion within the title, abstract or keywords of the documents retrieved. The analysis was carried out with two softwares, R and VOSviewer, in order to investigate the growth of interest on the topic over the years, the scientific production of countries, journals and authors, the social structure of collaborative network, and the network of keywords.

Results: 375 documents about job crafting were retrieved, showing a growing number of publications in recent years, with a preponderance of productions and citations in USA and Netherlands (where the construct was proposed and validated). Cluster analysis performed on the most frequently used keywords showed three main groups, each of them theoretical linked to workplace health: stimulus factors; Job Demands-Resources Model; health dimensions.

Discussion: The present bibliometric analysis showed an increasing scientific interest toward job crafting and the importance of specific papers (that opened the two main perspective about it) for the whole research line. Through the cluster analysis of keywords network, it was underlined the relevance of constructs that promote healthy organizations in the scientific production on job crafting.

keywords: job crafting, well-being, healthy organizations, job demands-resources model, scientometric analysis.

Introduction

Innovation, organizational performance, competitiveness, business success, are only some of the keywords that scholars as well as practitioners currently use to draw the turbulent and fast-moving scenario of the labour market. It is evident that the world is rapidly changing mainly under the economic pressure of globalisation and the radical revolution brought about by the digitalisation of most organizational processes (Manuti and De Palma, 2014, 2016; Manuti et al., 2018). As a result, new challenges are posed to organizations and workers who are constantly called to adapt their attitudes, skills and behaviours to heavy and often unpredictable job demands.

Within this frame, over the past decades abundant research in the field of Human Resource Management has focused attention on the need to understand how to support individuals and organizations in coping with the demands and requirements of the job. Coherently, many empirical evidences have confirmed that the competitive advantage of organizations can be driven by the accumulation of high-quality human resources: the intangible, rare, and non-substitutable asset of the organization (Fernández et al., 2000;

Lepak and Snell, 2002; Lepak et al., 2003; Wright et al., 2003; Ray et al., 2004; Lepak et al., 2006; Wright and McMahan, 2011; Jiang et al., 2012; Boon et al., 2018).

Within the Psychology domain, a valuable contribution to this debate is given by Positive Organizational Behaviour (POB), namely a quite recent stream of research studying the subjective and contextual features that enable individuals and communities to thrive, being a real competitive advantage for organizations (Cameron and Dutton, 2003; Cameron and Caza, 2004). The focus of POB is the need to integrate theory and research about resources that the employees have with effective applications of such knowledge in organizational contexts (Luthans, 2002; Luthans and Youssef, 2007). In this vein, this approach focuses on the study of the so-called HE.R.O organizations (Salanova et al., 2012), that is those organizations that are healthy and resilient, focusing on the conditions enabling their employees thriving, feeling good at work, and thus working more and better, and consequently reaching peak and sustainable performance (Wright et al., 2003; Zwetsloot and Pot, 2004; Spreitzer and Porath, 2012). In view of the above, healthy organizations are those contexts where culture, climate and good working practices concur to create an environment that concretely promote employees' well-being and performance, encouraging workers to perform positive behaviours and balancing job demands with personal motivations and expectations (Di Fabio, 2017).

The concept of job crafting perfectly fits into this perspective since it aims at expanding the most "organizational" perspectives on job design by considering the proactive and creative contributions that employees can give while "tailoring" their own jobs (Wrzesniewski and Dutton, 2001).

Undoubtedly, focusing on the proactive and agentic role of employees' behaviour "redesigning" their job, the concept of job crafting greatly contributes to the theoretical perspective of positive organizational psychology, because it helps scholars and practitioners in understanding the process through which employees find meaning in their job, adjusting to the organizational demands and consequently performing better.

Job crafting: theoretical framework and main research perspectives

Employees use job crafting (Wrzesniewski and Dutton, 2001) as a strategy to create a fit between themselves and the demands of their jobs. By engaging in job crafting, employees reshape their job so that it can be more closely aligned with their motivations and with their skills and preferences (Tims et al., 2012, 2013a,b). This effort increases engagement and buffers against stress.

Wrzesniewski and Dutton (2001) were the first to introduce a job crafting model, defining it as "the physical and cognitive changes individuals make in the task or relational boundaries of their work" (Wrzesniewski and Dutton, 2001 p. 179), and identifying three

distinct ways in which it can be developed. First, employees can proactively modify the range, the aims and/or the kind of tasks they perform at work (task crafting). Second, they can change the quality and/or the frequency of interactions they have with others at work (relational crafting). Finally, they can change the way in which they think about or perceive their jobs (cognitive crafting). The three types of job crafting are not mutually exclusive, and employees may combine all of them (Wrzesniewski and Dutton, 2001; Berg et al., 2010; Wrzesniewski, 2003). According to this perspective, the physical and cognitive changes in task or relational boundaries aim at the improvement of meaning and identity at work.

However, more recent studies have demonstrated that job crafting may take forms (Lyons, 2008; Grant and Parker, 2009; Ingusci et al., 2018) that even if useful for employees to deal with their jobs and to reduce stress, are not recognized by the organization as such (see for example the strategy adopted by sale persons to avoid dealing with unpleasant clients).

Therefore, in an attempt to enlarge the paradigm, Tims et al. (2012) have proposed that job crafting might go behind the changes that employees might make in tasks, relationships and cognitions about their work, inscribing the construct within the Job Demands-Resources (JD-R) model. The JD-R model is a theoretical perspective elaborated to describe the specific features of job contexts that may challenge individual working experience (Bakker and Demerouti, 2007; Demerouti et al., 2001). According to the model, each job context is featured by two main competing dimensions related to job processes: job demands and job resources (Schaufeli, 2017). Job demands are all those physical, psychological, social and organizational aspects requiring substantial physical and psychological efforts and that are therefore associated with some costs (Demerouti et al., 2001). Job demands can be physical and cognitive as well (e.g. heavy workload, time pressure, emotionally challenging interactions with others, etc.), but they are not necessarily negative for individuals: they might become an obstacle to well-being and performance once workers perceive them being an exceeding effort. On the other hand, job resources are those physical, psychological, social or organizational aspects that can be functional to achieve objectives within the working context. They are useful to reduce the physiological and psychological costs associated with job demands and to improve learning and development skills. Examples of job resources are job autonomy, performance feedback, social support, supervision, coaching and time control. Job resources are intrinsically and extrinsically motivating (Bakker and Demerouti, 2007) as they allow to fulfil human needs, values, career growth and autonomy expectations.

Following this theoretical framework, job crafting is meant as the concrete effort through which workers actually shape and adapt their work in order to balance job demands with job resources. More specifically, Tims et al. (2012) proposed that job crafting consists in the attempt to balance job demands (i.e. all the aspects of the job requiring sustained physical and/or psychological effort or skills) and job resources (i.e. those aspects of the job that individuals consider important and stimulating to reduce job demands and

their associated physiological and psychological costs) with personal abilities and needs (Bakker and Demerouti, 2007; Tims and Bakker, 2010). Accordingly, job crafting consists of three conceptually different dimensions, namely:

1. increasing job resources;

2. increasing challenging job demands and

3. decreasing hindering job demands.

More recently, these dimensions were enriched by a fourth valuable one - optimising demands - providing evidence that job crafting may be more strongly characterised by effortful actions to expand the work characteristics rather than to reduce them (Costantini et al., 2019).

A further significant contribution in the field was given by the work by Zhang and Parker (2019), who making a synthesis of the main perspectives of job crafting, proposed to integrate the debate with a three-level hierarchical structure of job crafting. The authors highlighted the need to distinguish a job crafting orientation versus an avoidance crafting orientation, behavioral versus cognitive crafting efforts and different kind of crafting contents, thus contributing to the discussion about the individual and organizational outcomes of job crafting, given that job demands are generally related with impairment processes as exhaustion, burnout, depression while job resources are, however, associated to motivation processes, as engagement and work commitment.

Job crafting and healthy organizations factors

Positive effects generated by job crafting on employees' psychological well-being (Berg et al., 2010; Sears et al., 2013; Slemp et al., 2015), work engagement, satisfaction and performance (Tims et al., 2012) are widely documented, suggesting that job crafting could be crucial for several key individual and organizational outcomes (Podsakoff et al., 2009) which could promote a healthy organization.

Given the premises drawn above, workplace well-being is recognized as a fundamental feature of positive and successful organizations, contributing to desirable outcomes such as job retention and sustainable performance (Harter et al., 2002; Warr, 1999). Thus, it is not surprising that organizations are becoming increasingly interested in ways to enhance the well-being of their employees. Among the several theoretical perspectives that have studied well-being, the Self-Determination Theory (SDT; Deci and Ryan, 2008; Ryan and Deci, 2000) is the one that has mostly contributed to explain the process through which it could be achieved. SDT argues that individuals are driven by three intrinsic psychological needs that, when satisfied, lead to personal growth, optimal functioning, environmental adjustment, and well-being: autonomy, relatedness, and competence. Applied to the working context, autonomy refers to employees' perception of being able to freely manage one's own work. Relatedness refers to the perception of

being able to build positive relationships at work. Competence refers to the sense of self-efficacy and mastery at work. Extensive research has proved the fundamental role played by these three needs for human flourishing (Deci and Ryan, 2000; Vansteenkiste and Ryan, 2013).

Therefore, in front of these evidences, scholars in the field of work and organizational psychology, have engaged in exploring how these needs could be nurtured and satisfied in the workplace. One of the most valuable approach in this direction is the person-job fit approach, which postulates that in the workplace individuals tend to spontaneously align their resources (e.g. knowledge, strengths, skills, needs, and preferences) with the demands and requirements of the job (Edwards, 1991; Kristof-Brown et al., 2005). Once the alignment is accomplished, employees tend to feel more engaged and satisfied (Warr and Inceoglu, 2012), simply because they are sufficiently challenged by their job, without feeling overwhelmed and stressed.

In a similar vein, another theoretical perspective, the Job Demands–Resources model (JD-R) drawn above, suggests that stress emerges as a response to the perceived imbalance between job demands and the resources that the employees have to cope with those demands (Bakker and Demerouti, 2007). Yet, research on this conceptualization of job crafting has shown that job resources foster positive organizational outcomes (Salanova et al., 2005; Crawford et al., 2010; Halbesleben, 2010) can stimulate employees to develop their knowledge and skills and to attain more difficult goals (LePine et al., 2005) and can buffer the negative effects of job demands (Schaufeli and Bakker, 2004; Bakker et al., 2005; Bakker and Demerouti, 2007; Hakanen and Roodt, 2010) also impacting on workplace well-being (Slemp and Vella-Brodrick, 2014; Tims et al., 2013a; Slemp et al., 2015; Van Wingerden et al., 2017).

Bakker et al. (2012) found in their study that employees characterized by proactive personalities were more likely to craft their jobs (by increasing job resources – structural and social, and job demands – seeking challenges). Furthermore, higher levels of work engagement were related to higher levels of in-role performance. These results indicate that job crafting may have positive and negative (it depends on resources increasing or demands reducing) consequences on work engagement and effects on groups and individuals performance. These connections were found also in Petrou et al.'s (2012) study that investigated daily fluctuations in job crafting. They found that daily level of job crafting influenced daily fluctuations of work engagement. In particular, employees who tended to adjust job resources and challenges on a specific day, were more engaged in their job. Therefore, these findings suggest that job crafting, being a strategy to autonomously redesign one's own job, might influence work engagement and performance at work. On the same line, Leana et al. (2009) conducted a study in the childcare sector, showing how workers (in this case teachers) crafted their jobs, highly impacting on classroom quality. Results suggested that job crafting was positively associated to performance, satisfaction and engagement. Further evidence were given by a more recent study by Costantini and Sartori (2018) and by the meta-analysis on job crafting interventions efficacy conducted

(Oprea et al., 2019). Respectively, Costantini and Sartori investigated the efficacy of job crafting through a three-day long resource-based intervention conducted on a sample of public sector employees, showing positive effects on emotions and workers' well-being. Coherently, Oprea and colleague confirmed statistically significant results on work engagement and on contextual performance.

In a similar vein, several studies (Oprea and Iliescu, 2015; Singh and Singh, 2018; Cheng et al., 2018) highlighted that job crafting might also act as a proactive coping strategy aimed at reducing role stress and burnout. In their study, Singh and Singh (2018) suggested that job crafting could significantly decrease exhaustion of workers, performing an important role in reducing burnout. This process leads to a reinforcement of proactive initiative that in turn might reduce the stressing conditions on the job. Cheng et al. (2018) analysed job crafting in hotel workers and found that burnout was a negative mediator in the relation between job crafting and job satisfaction. Thus, higher level of job crafting could buffer the feeling of exhaustion and burnout. Furthermore, Oprea and Iliescu (2015) in a study conducted with IT employees explored the relationship between burnout and job crafting dimensions, as defined by the Job Demands-Resources Model. In particular, they found that burnout was positively associated with decreasing hindering job demands while it negatively influenced increasing challenging job demands. Results suggested therefore that burnout perception increased proactive behaviours.
In light with this evidence, the present work aimed:

1. to perform a scientometric analysis on the corpus of articles on job crafting conducted in the last 20 years, i.e. from January 1st 2001 to December 27th 2019;

2. to propose a brief discussion on the main clusters emerged from the scientometric analysis, with a special focus on issues related to those factors that can contribute to promote and develop healthy organizations.

Method

Data collection

A literature search was conducted on December 27th 2019 on Scopus to retrieve all the publications about the main construct of the study. Scopus is the largest abstract and citation database of peer-reviewed research literature in the fields of science, technology, medicine, social sciences, and arts and humanities. It covers over 20,000 peer-reviewed journals including those published by Elsevier, Emerald, Frontiers, Informs, Interscience, Taylor and Francis, Springer.

The term "job crafting" was searched in titles, abstracts, and keywords of all documents in the Scopus database. The search was executed among every subject area because of the feature of interdisciplinarity of the construct, which could be applied not only in the fields of Work Psychology, but also in Business and Economics areas, as well as in Social

Sciences in general, or Medical research too. A database focused on job crafting, containing various information for each record, such as abstract, keywords, authors, sources, provenience, list of references, citation details, funding details, and other bibliographical information were exported in BibTeX format. Subsequently, it was converted into a dataframe using R software (R Core Team, 2019) and "bibliometrix" R package (Aria and Cuccurullo, 2017).

Scientometric analysis

Bibliometrics, scientometrics and infometrics are methodological and quantitative approaches in which the scientific literature itself becomes the subject of analysis. Although their historical origins differ and they are not necessarily synonymous (Hood and Wilson, 2001), nonetheless they share theories, methods, technologies, and applications. Their main aim is to measure the evolution of a scientific domain, the impact of scholarly publications, and the process of scientific knowledge production, and they often comprehend the monitoring of research in a given field, the assessment of the scientific contribution of authors, journals or specific articles, as well as the analysis of the dissemination process of scientific knowledge (Mao et al., 2015).

Scientometric analyses were conducted on the dataframe of bibliographic records. Such analyses can be either descriptive, for knowing for example how many articles have been published in a certain field or by an organization or a journal, or it can be evaluative, for knowing how some articles influenced subsequent research and in which direction the trend of those publications goes (McBurney and Novak, 2002). Furthermore, Bibliometric visualization techniques were used to present a structural overview about the net of publications, citations and co-occurrences.

Several tools and software have been developed and proposed in order to perform scientometric analysis, among the most known there are BibExcel, Bibliometrix R Package, CiteSpace, CiteNetExplorer, SciMAT, Sci2, VOSviewer, et cetera. For the present work two of them were used, namely Bibliometrix R Package (Aria and Cuccurullo, 2017) and VosViewer (Van Eck et al., 2010; Van Eck and Waltman, 2010, 2014). Bibliometrix R Package is an open-source tool for quantitative research in scientometrics and bibliometrics, developed in the statistical computing and graphic R language, that includes all the main bibliometric methods of analysis. It provides routines for importing bibliographic data from the main scientific databases (Scopus, WoS, PubMed and Cochrane), and to perform bibliometric analysis and building data matrices for co-citation, coupling, scientific collaboration analysis and co-word analysis. VOSviewer is an open-source software tool for constructing and visualizing bibliometric networks. These networks may include journals, authors, or individual publications, and they can be constructed based on citation, bibliographic coupling, co-citation, or co-authorship relations. VOSviewer can also construct and visualize co-occurrence networks of important terms extracted from a body of scientific literature.

For the present study, a focus was given to performance analysis, i.e. the statistical analysis of scientific outputs in a corpus of bibliographic records. Performances of Countries, Journals, Institutes and Authors which published about job crafting were analysed in order to show research contents and trends associated with that topic and to highlight the explicit relation with health dimensions, such as well-being or burnout. Cluster analysis based on authors' keywords was employed in order to conceptualize the deep structure of the research field and its trends throughout different disciplines and methodologies. Cluster analysis based on authors' keywords was employed in order to map the structure of the research field and to explore relationships and associations between topics.

Results

Job crafting publications

The Scopus search on job crafting returned a total of 375 documents from 203 different sources (Journals, Books, etc...) in the period between 1st January 2001 and 27th December 2019. Although the "job crafting" as a construct included in the job demands-resources perspective has been validated in 2012 by Tims et al., we decided to take documents from 2001 because Wrzesniewski and Dutton since that date started to use the term "job crafting" in a role-based perspective, in order to indicate "the physical and cognitive change individuals make in the task or relational boundaries of their work" (Wrzesniewski and Dutton, 2001, p.179). We aimed to consider both perspectives, since they have relevant points in common, in fact both insist in highlighting the importance of changes employees make in their jobs to improve their well-being and motivation and to achieve the person-job fit (Zhang and Parker, 2019). In the retrieved dataframe of 375 documents, the most were research papers (324 items, 86.4%) and the others were reviews/meta-analysis (16 items, 4.3%), conference papers (10 items, 2.7%), editorial (1 item, 0.3%), book chapters (19 items, 5.1%) and books (5 items, 1.3%).
The increasing interest on the topic is evident looking at the number of publications per year, as shown in Figure 1, which highlights the exponential growth of production about job crafting with an annual percentage growth rate of 43.5% and a great peak in 2019 (109 items, 29.1%)
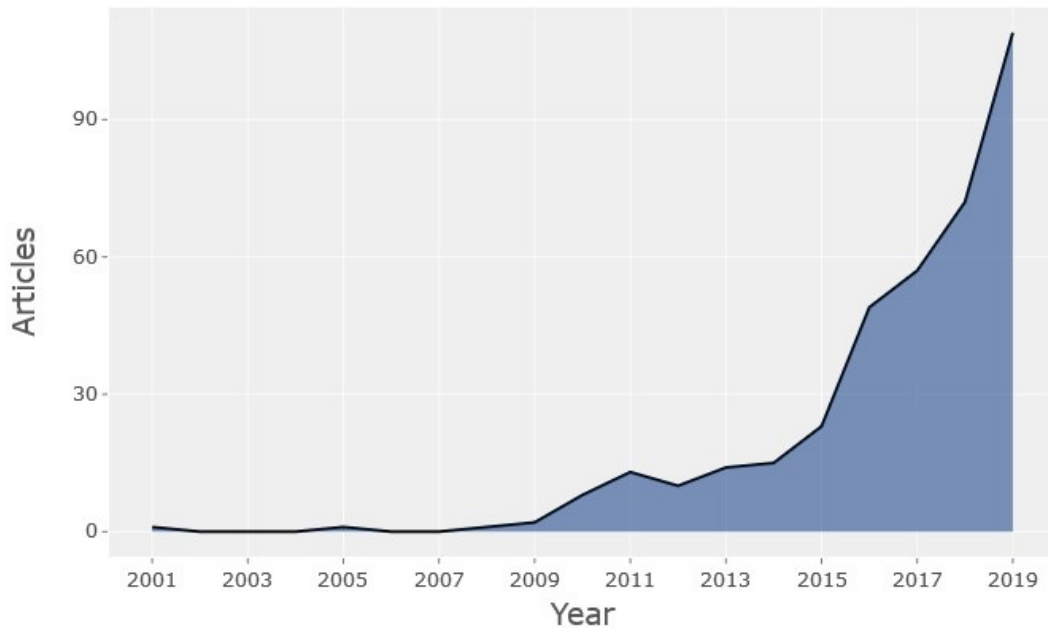
Figure 1: Number of publications about job crafting per year

Performance of Countries

Figure 2 shows the bibliographic coupling of countries with overlay visualization. Bibliographic coupling, like co-citation, is a measure that uses citation analysis to establish a similarity relationship between documents. Bibliographic coupling occurs when two works reference a common third work in their bibliographies. It is an indication that a probability exists that the two works treat a related subject matter (Martyn, 1964). The minimum number of publications of a country was set on 10 with a minimum number of citations of 100. In scientometrics, setting thresholds is arbitrary, in fact we may have selected also a different number of publications as threshold (Vinkler, 2010). Considering the descriptive statistics of the analysed set of data concerning the number of publications of countries, we noticed that it was composed by a total of 538 publications for 52 countries with 10,35 as mean and 10,75 as third quartile, so we decided to set the threshold on 10 in order to focus the analysis on that part of the distribution with the largest number of publications. We established a similar criterion to set the threshold for the number of citations with a small approximation, since the third quartile of that distribution was 105 in a total of 10314 citations for 52 countries. Of the 52 countries, 11 met the thresholds. For each of the 11 countries, the total strength of the bibliographic

coupling links with other countries was calculated. The minimum number of publications of a country was set on 10 with a minimum number of citations of 100. Of the 52 countries, 11 met the thresholds. For each of the 11 countries, the total strength of the bibliographic coupling links with other countries was calculated. The countries with the greatest total link strengths were selected (Table 1). The most productive country regarding job crafting is Netherlands with 112 documents with 4093 global citations for a total link strength of 118219. This result was expected since the construct has been proposed into the job demands-resources perspective in Netherlands (Tims et al., 2012) and it gave a substantial boost to the scientific interest about the topic, opening a new research line, as we can see in the exponential increase of the numbers of publication about it (Figure 1).

Table 1: Top Countries by number of documents, number of citations and total link strength

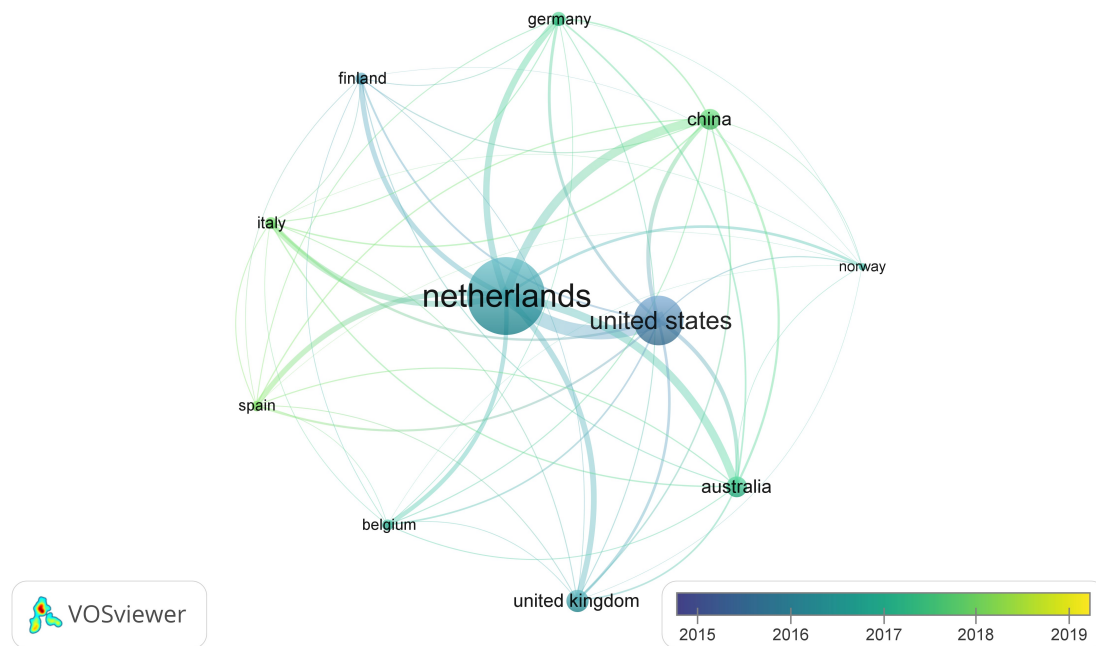| Country	Documents	Citations	Total link strenghts
Netherlands	112	4093	118219
USA	72	1808	65754
China	30	325	42277
Australia	30	705	40712
Germany	21	371	31662
United Kingdom	32	363	29297
Italy	18	105	28806
Spain	15	106	25660
Finland	17	262	23746
Belgium	16	199	21298
Norway	11	298	13197

Figure 2: Bibliographic coupling of top Countries. The size of the circles represents the number of documents published by each Country.

Performance of Journals

Table 2 shows the five journals that published more articles about job crafting and their global and local citations. Local number of citations refers to the times one document has been cited within the retrieval collection about job crafting, whilst global number of citations refers to the times the document has been cited within the entire scientific database used for retrieval, in this case Scopus. Figure 3 shows the result of the loess regressions, highlighting the number and the publication time of articles about job crafting for the five journals with the higher number of publications in this topic. Loess regression is used to show the local relationship between the two aforementioned variables within the publication range of each journal. The result is a smooth curve through a scatter diagram, that locally minimize the variance of the residuals. The value of the curve at a particular location along the x-axis is determined only by the points in that vicinity. In fact, this method allows the function to assume values below zero if the data is close to zero, because the function has an unlimited distribution (Cleveland, 1979). Figure 3 shows that those five journals increased their productivity regarding job crafting in the last seven years, during which was developed the new perspective about job crafting derived from work design theory (Zhang and Parker, 2019). The most productive journal about job crafting is the "European Journal of Work and Organizational Psychology", which mission is to promote and support the development of Work and Organizational Psychology, so it is focused on job dynamics and behaviors, such as crafting tasks, im-

proving work conditions, aiming at well-being at work. Between the others, "Frontiers in Psychology", in particular, shows a constant increment of published articles especially in the latest years, and that is the reason why this journal has few global and local citations, since its articles on the topic are very recent. It is interesting to notice that the journal with the highest number of global citations (1402) is not in the top five of productive (in terms of number of published articles) journals, nor even in the top ten. In fact, "Academy of Management Review" could boast just one article in the retrieved database, but is has been cited globally 1402 times, because it has been the first scientific paper that talked about job crafting and proposed the first perspective of the active changes that employees make to improve their situation (Wrzesniewski and Dutton, 2001). Not surprisingly, the second journal with the highest number of global citations is "Journal of Vocational Behavior" that published the article that opened the second perspective about job crafting, inscribing it in the job demand-resources model (Tims et al., 2012).

Table 2: Top journals by number of publications about job crafting, global and local citations.

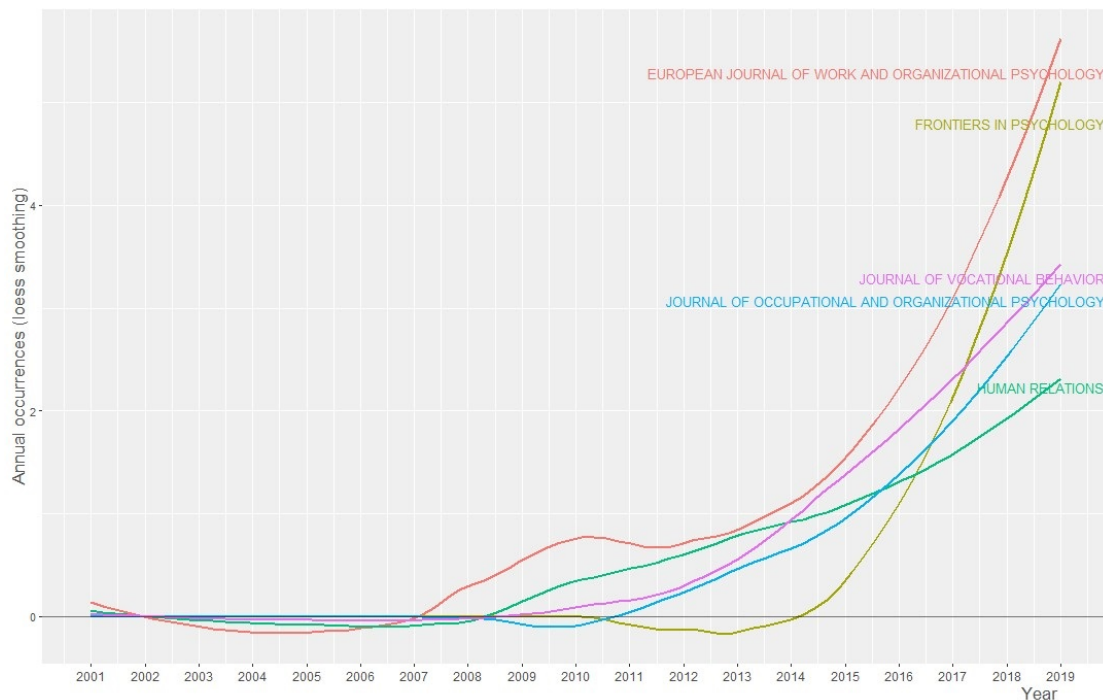| Journal	Articles	Global citations	Local citations
EUROPEAN JOURNAL OF WORK AND ORGANIZATIONAL PSYCHOLOGY	21	805	297
JOURNAL OF VOCATIONAL BEHAVIOR	14	863	827
HUMAN RELATIONS	11	514	382
JOURNAL OF OCCUPATIONAL AND ORGANIZATIONAL PSYCHOLOGY	11	186	372
FRONTIERS IN PSYCHOLOGY	11	14	14

Figure 3: Growth trend of documents' production about job crafting for the top five journals.

Performance of Authors

Figure 4 shows the 10 most productive authors about job crafting and their production over time: the line represents an author's timeline; the bubbles size is proportional to the number of published documents and their colour intensity is proportional to the total citation per year. The author with the highest number of items, Bakker A. B., started to refer to job crafting from 2010 in a book chapter (Bakker, 2010) and kept on publishing articles during the following years. The other top authors, on the contrary, started their productions about job crafting only after 2012, the year in which the construct was validated in the new perspective in reference to the job demands-resources theory (Tims et al., 2012). In addition to being the most productive, some of these authors are also the most cited, as shown in Table 3 that indicates the authors impact by the top 10 for total citations, and shows in addiction the H-index, the m-index, g-index, the number of publications (NP) and the year of the first publication about job crafting.

The Hirsch index (H-index) is an author's number of published articles (h) each of which has been cited in other papers at least h times. The m-index is defined as H/n, where H is the H-index and n is the number of years since the first published paper of the scientist. The g-index has been introduced by (Egghe, 2006) as an improvement of

the h-index in order to measure the global citation performance of a set of articles (Aria and Cuccurullo, 2017). In accordance with the performance of journal analysis, we can notice that two authors, Wrzesniewski A. and Dutton J. E., have very large numbers of total citations (1790) despite of few publications (3) on the topic, because they proposed for the first time a model of job crafting (Wrzesniewski and Dutton, 2001), in fact their paper is the first of our database. Table 4 shows the corresponding authors' Countries, namely those who take primary responsibility for communicating with the journal. In the two previous analyses of this paragraph, we referred to any author who were included in a paper of our database. Differently, Table 4 is focused on the countries of the corresponding author, highlighting that Netherlands, as expected, is at the first place with 47 articles, followed by United States with 34 items. Furthermore, Table 4 indicates how many of those articles was developed with an intra-country (SCP – Single Country Publication) or an inter-country (MCP – Multiple Country Publication) collaboration, showing that U.S. authors have the highest number of articles with no foreign collaboration (31) and just 3 articles involving at least one co-author from a different country, as underlined in the corresponding low MCP_Ratio (0.09). On the contrary, Dutch authors show a quite high MCP_Ratio (0.38) demonstrating a high international collaboration involving the contribution of multiple countries. In fact, focusing on the social structure of collaborative network through a cluster analysis of authors' collaborations (Peters and Van Raan, 1991), we can see in Figure 4 that the top authors from Netherlands has more and stronger connections with other authors, creating the largest cluster, underlining that those authors relate the most with others in the field of job crafting.
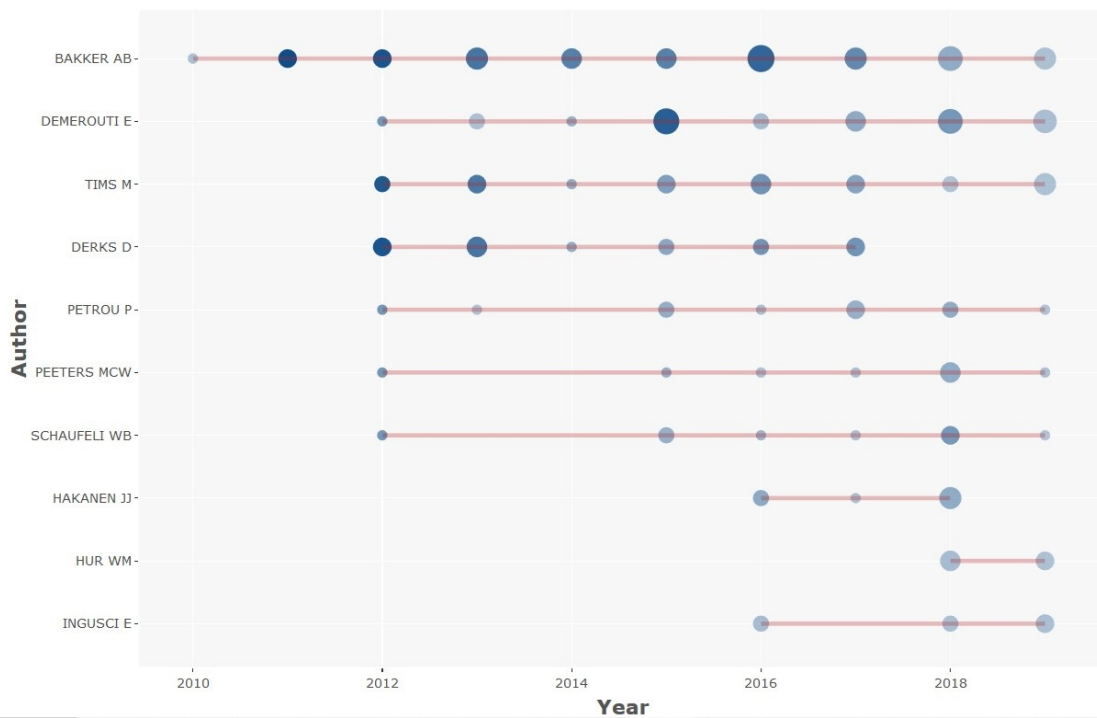
Figure 4: Production over years of the most productive Authors. The size of the circles represents the number of documents published each year by each Author, and the colour intensity is proportional to the total citation per year.

Table 3: Top authors by h index, g index, m index, total citations, number of publications (NP), year of the first publication (PY start). Authors' list is ordered by number of total citations.

Author	h_index	g_index	m_index	Total Citations	NP	PY_start
BAKKER AB	23	46	2,09	2879	46	2010
DUTTON JE	3	3	0,15	1790	3	2001
WRZESNIEWSKI A	3	3	0,15	1790	3	2001
DERKS D	13	15	1,44	1522	15	2012
TIMS M	13	23	1,44	1485	23	2012
DEMEROUTI E	15	30	1,67	936	31	2012
BERG JM	3	3	0,27	591	3	2010
SCHAUFELI WB	7	9	0,78	479	9	2012
PETROU P	8	11	0,89	462	11	2012
ALBRECHT SL	2	2	0,20	446	2	2011

Table 4: Top corresponding Author's Countries by number of articles, relative frequency (Freq), single country publications (SCP), multiple country publications (MCP), and ratio between the number of multiple country publications and the total number of articles (MCP Ratio).

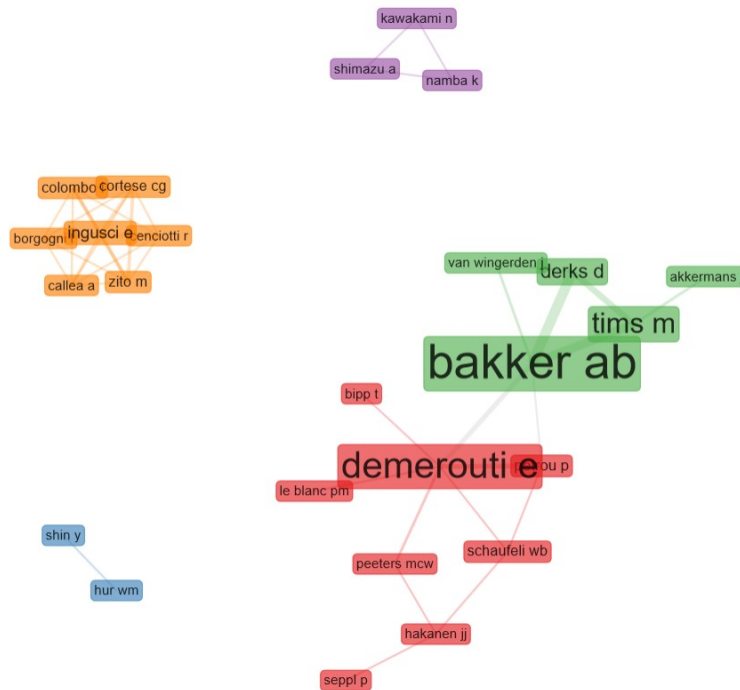| Country	Articles	Freq	SCP	MCP	MCP_Ratio
NETHERLANDS	47	0,23	29	18	0,38
USA	34	0,17	31	3	0,09
KOREA	14	0,07	13	1	0,07
CHINA	11	0,05	4	7	0,64
ITALY	9	0,04	5	4	0,44
FINLAND	8	0,04	2	6	0,75
GERMANY	8	0,04	7	1	0,13
UNITED KINGDOM	8	0,04	5	3	0,38
TAIWAN	6	0,03	6	0	0,00
AUSTRALIA	5	0,02	3	2	0,40

Figure 5: Cluster analysis of Authors' collaborations.

Document Analysis

As underlined in the previous paragraphs, there are some relevant documents that have influenced a lot the performance results of countries, journals and authors: in particular they are the two articles that opened respectively:

1. the job crafting perspective focused on changes of task, relational and cognitive boundaries (Wrzesniewski & Dutton, 2001);

2. the job crafting perspective focused on changes of job characteristics (Tims et al., 2012).

In fact, these two articles result to be the most cited in our selected scientific collection on job crafting (local citations). So, we can say that they are relevant for the all scientific topic and its growth. Table 5 shows the number of citations received by the top 10 articles ranked for local citations and their respective number of global citations (in the entire bibliographic database, Scopus). Local and global citations are not coherent for every document, because while the local citations are an excellent index of the impact of a document for the specific topic, global citations could come from distant and remote scientific production focused on another topic that have treated job crafting only marginally. For example, in our database there is a paper (Bakker et al., 2011), as

others, that has a very high number of global citations (365), but a very low number of local citations (14), demonstrating to be little centred on job crafting.

Table 5: Top documents by year, local and global citations. Documents' list is ordered by local citations.

Document	Year	Local Citations	Global Citations
WRZESNIEWSKI A, 2001, ACAD MANAGE REV	2001	308	1408
TIMS M, 2012, J VOCAT BEHAV	2012	227	356
PETROU P, 2012, J ORGAN BEHAV	2012	149	263
LEANA C, 2009, ACAD MANAGE J	2009	132	213
BERG JM, 2010, J ORGAN BEHAV	2010	129	292
TIMS M, 2013, J OCCUP HEALTH PSYCHOL	2013	128	270
BAKKER AB, 2012, HUM RELAT	2012	124	257
LYONS P, 2008, J BUS PSYCHOL	2008	82	103
TIMS M, 2013, GROUP ORGAN MANAGE	2013	68	108
DEMEROUTI E, 2014, EUR PSYCHOL	2014	65	90

Cluster analysis of keywords

In order to identify and understand possible ensembles of semantic knowledge in this scientific area, a cluster analysis of keywords co-occurrences network (KCN) were performed. Cluster analysis is a multivariate technique that makes it possible to minimize the semantic distance between items belonging to a group and to maximize the distance between groups, in order to provide a knowledge structure of a given research field. Keyword co-occurrences refer to the common presence, frequency and proximity of keywords that are similar to others, i.e. based on the same topic or aiming the same objective. In other words, keyword co-occurrence is an association or combination of terms that marks the presence of a keyword in several papers (more than one) of a bibliographic database. Since the keywords of a paper are supposed to indicate the core concept of the study, this method is useful to systematically explore the knowledge-components and the knowledge-structure constructed by the keywords of papers in a specific research field or topic. The KCN's modularity is the network ability to decompose into separated modules or clusters. Each link between keywords in the network has a strength represented by a positive numerical value; the higher this strength value, the stronger the linkage. The total link strength represents the number of publications in which two keywords occur together. In other words, link strength refers to the strength of semantics association between keywords. Highly cited keywords were analysed and visualized with Vos viewer (Van Eck and Waltman, 2014). This software is useful for analysing literature of a specific domain supporting the visual exploration of bibliographic databases. For this purpose, only the "author's keywords" were considered, excluding "keywords plus" within which we found general nonspecific terms such as "human", "adult", "male" and "female". Indeed, keyword plus are index terms automatically generated by an algorithm of the search database from the titles of cited articles. Balancing the minimum

number of possible co-occurrences of a keyword to enter the network, the co-occurrences threshold was set on 12. As specified above, setting thresholds is arbitrary (Vinkler, 2010). In this case, considering the particular form of the distribution of the number of occurrences for each keyword, which is asymmetric and leptokurtic, showing a skewness of 25,44 and a kurtosis of 695,02, we decided not to set the threshold on a quantile criterion, but to focus the analysis on the 1% of the 873 keywords of our dataset, so we took up only the 9 keywords with largest numbers of occurences through a threshold of 12 occurences. In this way, only 9 (including "job crafting" with the highest frequency) of the 873 keywords in the database met the threshold and were brought into visualization (Figure 5). For each of the 11 keywords, the total strength of the co-occurrence links with other keywords was calculated. The keywords with the greatest total link strength were selected. Table 6 shows the selected keywords which are the most relevant in our database because they have largest strength of semantics association with other keywords in our dataset. Keywords that are not included in Table 6, neither in Figure 6 and in the associated analysis, present lower numbers of occurrences and lower numbers of total link strengths. The cluster analysis was initially conducted including also "job crafting", which showed important connections with all the other keywords, as expected. Then, we decided to exclude the keyword "job crafting" since it is the main topic of the database and we aim to explore the associations between all the other keywords. In Figure 6, each keyword is represented by each node and the links of a keyword are represented by the circle size; the larger a circle the more a keyword is linked in our database. The colours of circles represent the calculated clusters: keyword belonging to the same cluster are represented with the same colour of circle, suggesting a particular relation between those keywords. Three clusters were calculated: the first includes "work engagement", "job satisfaction", "job design" and "job performance" and we called it "stimulus factors"; the second includes "job resources" and "job demands-resources model" and we referred to this groups with the name of the latter keyword, since the former is part of the model; the third includes "well-being" and "burnout" and we called it "health dimensions".
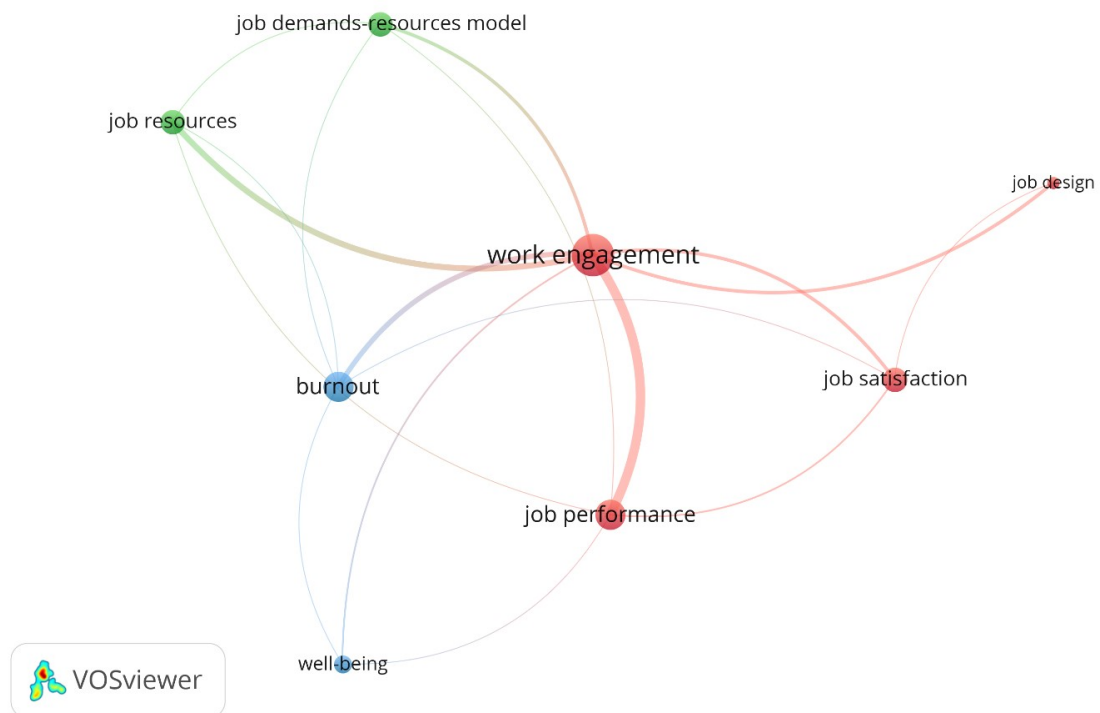
Figure 6: Cluster analysis of keywords co-occurrences network. The size of the circles represents the total link strength of each keyword, and the thickness of each line represents the strength of the connection between two keywords.

Table 6: Keywords extracted by cluster analysis by occurrences and total link strength.

Keyword	Occurrences	Total link strength
Job crafting	264	155
Work engagement	78	107
Job performance	20	34
Job satisfaction	17	21
Job design	15	18
Burnout	14	23
Job resources	12	19
Job demands - resources model	12	17
Well-being	12	12

Discussion

The purpose of the present study was to overview the state of the art of the debate about the relationship between job crafting and healthy organizations' factors by performing a scientometric analysis of job crafting, focusing on factors that could promote healthy workplaces. Therefore, the study was aimed to emphasize performances of countries, journals and authors, highlighting the dominant perspectives of job crafting, in order to map the scientific knowledge produced on the topic.

The analysis of citations received by countries, journals and authors reveals that their performance indices are not only influenced by their scientific production in general (number of published documents), but especially by specific articles which are the most cited in our database and assume a great importance for the all topic. These two articles opened respectively two dominant perspectives on job crafting: the role-based perspective (Wrzesniewski and Dutton, 2001) and the resources-based perspective (Tims et al., 2012). Wrzesniewski and Dutton (2001) were the first to introduce a job crafting model, proposing three types of crafting related to task, relations or cognitive aspects of job. According to this perspective, the physical and cognitive changes in task or relational boundaries aim at the improvement of meaning and identity at work. The latter perspective by Tims et al. (2012) inscribed the job crafting into the job demands-resources theory, identifying four types of individual changes related to the increase of structural and/or social job resources, the increase of challenging job demands, and/or the decrease of hindering job demands. According to this perspective, individual crafting aims to improve working conditions and motivation, achieving person-job fit. The opening of these two perspectives gave a substantial boost to the scientific interest about the topic, which resulted in an exponential growth of productions right after their publications. In the recent years some authors tried to integrate the role-based and the resources-based perspectives, applying the approach and avoidance themes (Bruning and Campion, 2018) and proposing a hierarchical structure, which distinguishes between behavioural crafting and cognitive crafting and analyses resources and demands for each type (Zhang and Parker, 2019). These attempts of integration, underlining the commonalities of different perspective, substantiate our view of the job crafting as a unique scientific field that is receiving more and more contributions of development, growing and confirming its importance in workplaces. This overview on the scientific production about job crafting met the second aim of our study, emphasising the evolution of the construct and the impact of scholarly publications about it.

The first aim of the manuscript, concerning the relationship between job crafting and healthy organizations' factors, was met exploring the conceptual structure of job crafting, which was outlined using a co-occurrence network analysis to map and cluster high-frequency author keywords. As detailed above, the aim of a cluster analysis is to forming groups of keywords minimizing the semantic distance between items belonging to a group and to maximize the distance between groups. The results of our analysis are three clusters of keywords related to job crafting arguments. The first cluster merges

aspects concerning the worker's point of view (engagement and satisfaction) with aspects concerning the organization's interests (design and performance), underlining the semantic proximity in our dataset of those four keywords, grouping them together in a cluster. We could call this group "stimulus factors". In this result of grouping we could underline the purpose of those lines of research that consider job crafting as part of the process in which organizational factors, such as job design, could promote employees' motivation factors, such as engagement and satisfaction, creating better person-job fit and obtaining, as results, better performances and higher levels of well-being for employees (Bakker and Demerouti, 2018; Cotton and Hart, 2003; Cullinane et al., 2017; Lee and Lee, 2018; Lu et al., 2014; ?). Job design is considered in scientific literature as an important factor for healthy organizations, because characteristics of work could affect positive psychological aspects of workers (Hackman et al., 1978). The concepts of job engagement and job satisfaction are used by lots of authors as indicators of well-being at work (Ingusci et al., 2016; Tims et al., 2013a), because they could influence the quality of the working life, the level of pleasure and activation (Bakker and Demerouti, 2007; Bakker and Oerlemans, 2011; Signore et al., 2019). The second cluster is composed of a theoretical framework, the "job demands-resources model" (Bakker and Demerouti, 2007), and one of the factors included in that model, "job resources". As drawn above, the job demands-resources model claims that each occupation has its specific requests and work resources: the former bring physiological and psychological costs which could lead to health problems; the latter consist of functional supports for the enhancement in motivation and the achievement of objectives. Job crafting involves modifications in job design, so it is relevant to apply the construct on the job characteristics identified by this theoretical framework, in order to focus on the type of the possible changes (on job demands and/or on job resources) concerning how individuals personalize their work (Tims et al., 2013b,a). As anticipated through the indications about occurrences of keywords in Table 6, in our database "job resources" as keyword results far more cited then the other factor of the model, "job demands", since various authors could have preferred to give prominence to the aspects of the work that would promote positive outcomes. Job resources and the whole job demands-resources model aim to consider, focus and intervene on aspects that could promote an healthy workplace, increasing motivation and decreasing stress levels (Bakker and Demerouti, 2007; Demerouti et al., 2001; Petrou et al., 2015; Van den Heuvel et al., 2015; Xanthopoulou et al., 2007). The last cluster includes "well-being" and "burnout", two dimensions closely related to health at work (moreover, the latter has often been considered as a reverse indicator of the former). We could call this group "health dimensions". This cluster highlights an explicit link between job crafting and health dimensions, because it makes known firstly that those are some of the most used keywords in scientific production about job crafting, secondly that the two keywords have a basis in common related to the topic of health at work, thirdly that, although in separate clusters, those keywords present also links with the other main keywords, since healthy dimensions are relevant even when they are not the core of the discussion. The relationship between job crafting on well-being and burnout is clearly underlined in several scientific papers (Cheng et al., 2018; Petrou et al., 2015; Van Wingerden et al., 2017), such as one of the most important articles in our database

(because of the high number of local and global citations) which demonstrate that the active changes employees make to modify their levels of job demands and resources are positively related to enhanced well-being (Tims et al., 2013a,b). An additional point of view about job crafting at an interpersonal level is given by Tims, Bakker and Derks (2015) who explored the impact of individual job crafting on well-being of colleagues, discussing that the decrease of hindering job demands for someone could affect the levels of burnout of his/her colleagues. This perspective discloses new interpretations of our results, because it allows to consider the high occurrences of the "well-being" not only as referred to the individual health, but also to the health of team components. It is interesting that Tims et al. (2015) choose work engagement, job satisfaction and burnout as indicators of well-being, because they are some of the other most used keywords of our entire database, reflecting and confirming the individuated links between different conceptual clusters.

We might conclude that each top keywords of our database refers to constructs that promote healthy organizations, a concept that is scattered within the majority of the documents about job crafting, underlining the relevance of health for the job crafting scientific production. Our bibliometric analysis showed that the most influencing authors studying job crafting have used healthy organizations' factors as important variables in their studies, supporting the claim that job crafting has a strong relationship with health at work. In fact, when employees take active initiative to modify any aspect of their work, they aim to improve their own well-being giving importance to their preferences and needs, which influence the job in a bottom-up work redesign point of view.

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