



## Employee Locus of Control: A Bibliometric Analysis and Visualization of the Scientific Landscape

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### Abstract

This study aims to use bibliometric analysis and science mapping to explore the knowledge base on employee locus of control. There are 436 articles were retrieved from Scopus database. Bibliometric analyses such as keyword co-occurrence and bibliographic coupling were conducted using VOSViewer software. According to the results, studies on employee locus of control are on the rise. The most prolific article was “Relationship of core self-evaluations traits - Self-esteem, generalized self-efficacy, locus of control, and emotional stability - With job satisfaction and job performance: A meta-analysis”, by Judge & Bono, with the highest citation number (TC = 1744). The most prominent author was Judge, T.A., who has authored 3 articles with 2584 citations, followed by Spector, P.E., having 5 articles with 1822 citations. The most prolific journal was Journal of Applied Psychology having published 14 articles in the field, having 3278 citations. The Loyola University Chicago, USA was the most influential organization, as for two articles, there are 575 citations. The most productive country was the USA with 158 publications and 10 387 citations, and the closest collaboration was between the USA and China. Bibliographic coupling network consisted of 29 documents in six clusters. Keyword co-occurrence network was built out of 16 connected keywords, creating four clusters.

**Originality/value** – To the best of authors’ knowledge, no other bibliometric analysis on employee locus of control has been conducted. The current study bridges the gap in the existing literature by contributing to the understanding of employee locus of control, as it explores a profile of studies performed on it.

**Keywords:** *Employee locus of control, bibliometric analysis, bibliographic coupling, science mapping, VOSViewer*

### 1. Introduction

Locus of control refers to the degree to which individuals perceive that they can control things that happen to them (Rasch & Tosi, 1992). The theory of locus of control was first introduced by Julian Rotter in 1954 (Tillman, Smith, & Tillman, 2010). Since then a lot of research has been conducted on it across different domains, including the area of organization and management. Individuals have either an internal locus of control or an external locus of control (Srivastava, 2009). The ones with internal locus of control believe that they control their own actions and their consequences, while the ones with external locus of control perceive that

others, such as supervisors, managers, the organization, the universe, have control over them, and that outcomes depend upon those with control (Tillman et al., 2010). It has been found that employees with internal locus of control can better handle stressful workplace scenarios without negative health consequences (Karimi & Alipour, 2011). They are more proactive in finding practical solutions to conflict, while employees with external locus of control tend to avoid conflict (Wang, Bowling, & Eschleman, 2010). Furthermore, employees with external locus of control are prone to stress and depression (Srivastava, 2009) and may display dysfunctional behaviours (Paino, Ismail, & Smith, 2011). As employees with internal locus of control take responsibility for their own actions, they show higher performance (McKnight & Wright, 2011; Paino et al., 2011) and also lower turnover rates (Lewin & Sager, 2010); Ng & Butts, 2009; Tillman et al., 2010). Moreover, managers with internal locus of control are more supportive and involved (Byrne, 2011) and have many qualities of transformational leaders, such as communication, collaboration, participatory involvement and support (Mohapatra & Gupta, 2010).

In view of the importance of the locus of control in the domains of psychology and management, there is a need to conduct a bibliometric analysis to find out about the development of knowledge regarding the construct, to map it, define streams and concepts, and to use the findings for guiding future research.

Bibliometric studies have initially been performed in the library and information science research. Today they are conducted across various domains, including business, management and psychology. Various softwares have been developed to assist in bibliometric analyses; one of them being VOSViewer (van Eck & Waltman, 2010). Among other things, it helps with co-occurrence analysis, bibliographic coupling, cluster analysis and producing visual representations of bibliometric maps.

Hence, a bibliometric analysis was performed to address the following research questions:

**RQ1:** What is the chronological distribution of publications on employee locus of control?

**RQ2:** What are the top 10 most cited publications on employee locus of control and the characteristics of these publications?

**RQ3:** Who are the most prolific authors that have published articles on employee locus of control?

**RQ4:** What are the key journals that have published articles on employee locus of control and the characteristics of these journals?

**RQ5:** Which are the most influential institutions/universities that have published articles on employee locus of control?

**RQ6:** What is the pattern of contribution and collaboration of various countries to the publication of studies on employee locus of control?

**RQ7:** What are the key research streams and concepts on employee locus of control that have been explored by scholars?

## 2. Literature review

### *Employee LOC*

According to **Cobb-Clark (2015)**, in order to develop better understanding of labour market behaviour, economists should differentiate between LOC and self-control, motivation and self-efficacy. Besides that, though psychologists have developed occupation-specific LOC measures, economists focus more on LOC as a general concept, rather than a context-specific,

non-cognitive skill. Furthermore, internal LOC is becoming one of the core determinants of labour market success and human capital investment decisions. Also, it is an important factor for occupational sorting, though it is still debatable whether this fact is the result of organizations using LOC as a screening device when hiring or of workforce considering compensation arrangements when choosing their occupations.

In his study, **Spector (1982)** found that locus of control is a crucial concept for employee selection, as it helps in clarifying human behaviour in organizations. The behaviour of employees with internal or external LOC can differ across situations. Internals are best fit for high initiative-low compliance tasks, preferring participative approaches – either as participative supervisors or in situations requiring participative supervision, i.e. initiative and independent action. Besides that, they respond well to reinforcement contingencies (incentive systems or piece-rate systems) and are better at performing complex information collection and processing tasks. On the other hand, externals are best fit for low initiative-high compliance tasks. They prefer directive approaches, and are more suitable as directive supervisors or for situations that demand directive supervision, such as assembly line work, or any other task requiring precise carrying out of orders and close coordination of many people. Externals want incentives but will not necessarily value them and work harder for them, making them highly unresponsive to rewards.

**Ng & Butts (2009)** proposed that instead of adopting an entirely either individual or situational view, the turnover literature should embrace a person-situation interactionist perspective. They found that employees' levels of LOC highly affected employees' reactions to HR retention practices. Authors suggested that organizations might be more successful at increasing employees' loyalty of the employees with an internal LOC. Furthermore, as external LOC contributes to lower intentions to stay, managers should focus more on employees with an external LOC, in order to persuade them that indirect control at work is feasible. Retention of externals could be increased by cultivating interpersonal relationships, reinforcing membership, and demonstrating care and support, as employees with an external LOC would believe that their trusted colleagues (mentors, team members) could help them maintain control at work.

**Allen, Weeks, & Moffitt (2005)** found that relationship between turnover intentions and turnover behaviour was stronger for internals. They assumed that employees with internal LOC first try changing their environment by expressing dissatisfaction. If their efforts turn unsuccessful, they may intend to leave.

**Garson & Stanwyck (1997)** conducted the first study that focused on performance of teams, instead of performance of individuals, as previous studies had done. By using a simulation game of employees working in self-managed teams, they researched how LOC and performance-contingent incentives affect productivity and job satisfaction. Findings showed that externals with incentive significantly outperformed externals without incentive, especially when compared to internals' performance under both conditions. Additionally, internals expressed greater satisfaction with their supervisors.

### *Scopus*

The most prominent bibliographic databases in the field are Elsevier's SCOPUS, ISI Web of Science (WoS) and Google Scholar (Martín-Martín, Orduna-Malea, Thelwall, & Delgado

López-Cózar, 2018). For this study SCOPUS database was chosen as it covers 70% more sources than WoS (López-Illescas, de Moya-Anegón, & Moed, 2008), has more rigorous indexing procedures and generates more consistent search results than Google Scholar (Shareefa & Moosa, 2020).

### *Bibliometric analysis*

Bibliometrics is a “statistical analysis and quantitative tool to study publications”(Ozsoy & Demir, 2018). Bibliometric indicators are useful tools for assessing scientific relevance of a given field, appraising research output quality, and helping researchers to discover and pursue new research directions by revealing research trends and providing an overview and evolution of the core themes (Webster, 2011; de Battisti & Salini, 2013; Ozturk, 2021). Bibliometric analysis analyses and visualizes the structure of the research field and assists researchers and practitioners in identifying the most prolific authors, journals, institutions, countries and keywords (Aria & Cuccurullo, 2017; Cebrino & De la Cruz, 2020). Furthermore, bibliometric analysis has been used to inform management decisions and research policy (Khiste & Paithankar, 2017).

### *Bibliographic coupling*

Bibliographic coupling occurs when two publications cite a common third publication, establishing similarities in their reference lists (Kessler, 1963; Van Eck & Waltman, 2014; Srivastava & Sivaramakrishnan, 2021). The more common references two publications have, the stronger is the bibliographic coupling connection between the publications (Van Eck & Waltman, 2014; Srivastava & Sivaramakrishnan, 2021).

### *Co-occurrence analysis*

Co-occurrence analysis is a part of bibliometric analysis indicating the most frequent keywords in the publications, either in the keyword section or in the text of publications, and calculating the number of publications wherein two keywords appear in concurrence (Van Eck & Waltman, 2014).

## **3. Methods**

The data used in this study were sourced from the Scopus database (www.scopus.com). On 29 October 2021 the following initial search string was: *TITLE-ABS-KEY( "locus of control" AND ( employee OR workforce OR workplace OR worksite ) )*. The study period was established from the year 1973 through to 2021. Subject areas selected for this study were: Business, Management and Accounting, Psychology, Social Sciences, Medicine, Economics, Econometrics and Finance, Arts and Humanities, Engineering, Decision Sciences, Computer Science, Nursing, Neuroscience, and Health Professions. Only articles and review papers published in journals in the English language were included. As neither duplicate documents nor unfit documents were found, final number of document results was 436.

Final search string was: *TITLE-ABS-KEY ( "locus of control" AND ( employee OR workforce OR workplace OR worksite ) ) AND ( LIMIT-TO ( SUBJAREA , "BUSI" ) OR LIMIT-TO ( SUBJAREA , "PSYC" ) OR LIMIT-TO ( SUBJAREA , "SOCI" ) OR LIMIT-TO ( SUBJAREA , "MEDI" ) OR LIMIT-TO ( SUBJAREA , "ECON" ) OR LIMIT-TO ( SUBJAREA , "ARTS" ) OR LIMIT-*

TO ( SUBJAREA , "DECI" ) OR LIMIT-TO ( SUBJAREA , "NURS" ) OR LIMIT-TO ( SUBJAREA , "NEUR" ) OR LIMIT-TO ( SUBJAREA , "HEAL" ) ) AND ( LIMIT-TO ( DOCTYPE , "ar" ) OR LIMIT-TO ( DOCTYPE , "re" ) ) AND ( LIMIT-TO ( LANGUAGE , "English" ) ) AND ( LIMIT-TO ( SRCTYPE , "j" ) )

The collected data were exported from Scopus as a Comma-Separated Values (.csv) file that enabled data analysis in MS Excel and VOSViewer software version 1.6.17 (van Eck & Waltman, 2010). VOSViewer was used to analyse publication citations, co-authorships among countries, bibliographic coupling and keyword co-occurrence, to construct distance-based maps and visualize bibliometric networks. MS Excel was used to create tables using the output data from VOSViewer.

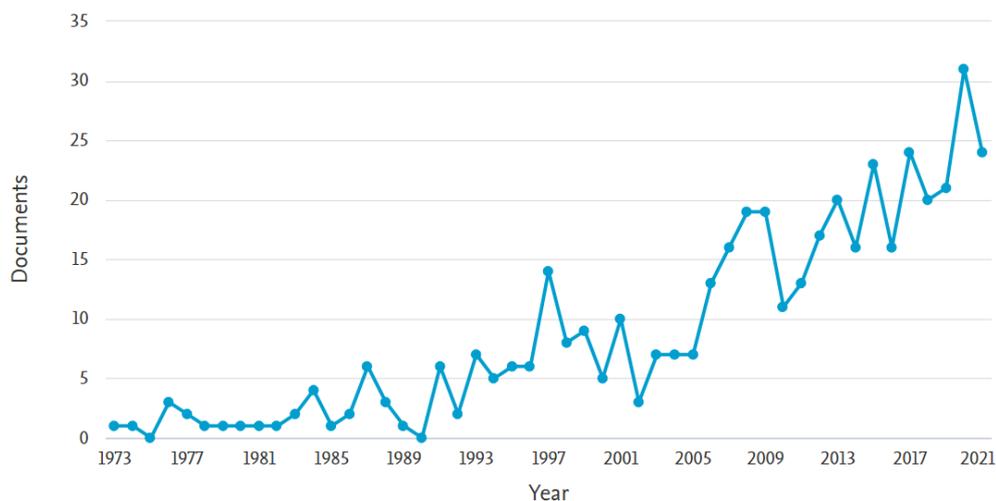
#### 4. Results and Discussion

Initial search for publications in the field of employee locus of control that were indexed in Scopus from 1973 to 2021 yielded 518 results. Based on the exclusion/inclusion criteria, mentioned in the method description, such as language, year, type of publication, 82 publications were removed. As there were no duplicates nor unfit documents, the final number of publications included in the study was 436.

##### 4.1. Chronological distribution of publications

Figure 1 shows the annual publications from 1973 to 2021 (by 29 October 2021). It is clear that there were limited publications before 2006, and its number began to increase steadily during the period from 2006 to 2021, reaching a peak (n=31) in 2020.

Figure 1. Chronological distribution of publications (1973-2021) (Source: Scopus)



Source: Authors

##### 4.2. Top 10 cited publications

The top 10 cited publications are listed in Table 1. The article with the highest citation number (TC = 1744) was "Relationship of core self-evaluations traits - Self-esteem,

generalized self-efficacy, locus of control, and emotional stability - With job satisfaction and job performance: A meta-analysis”, by Judge & Bono.

*Table 1. Top 10 cited publications*

S.No.	Title	Author(s)	Year	TC	Links
1	Relationship of core self-evaluations traits - Self-esteem, generalized self-efficacy, locus of control, and emotional stability - With job satisfaction and job performance: A meta-analysis	Judge & Bono	2001	1744	3
2	An emotion-centered model of voluntary work behavior. Some parallels between counterproductive work behavior and organizational citizenship behavior	Spector & Fox	2002	571	2
3	A model of work frustration-aggression	Fox & Spector	1999	533	2
4	Behavior in organizations as a function of employee's locus of control	Spector	1982	501	4
5	The power of being positive: The relation between positive self-concept and job performance	Judge, Erez & Bono	1998	444	3
6	The impact of personality on psychological contracts	Raja, Johns & Ntalianis	2004	438	3
7	Relationship of core self-evaluations to goal setting, motivation, and performance	Erez & Judge	2001	396	3
8	A dispositional approach to employability: Development of a measure and test of implications for employee reactions to organizational change	Fugate & Kinicki	2008	194	1
9	Turnover intentions and voluntary turnover: The moderating roles of self-monitoring, locus of control, proactive personality, and risk aversion	Allen, Weeks & Moffitt	2005	188	1
10	Correlates of different forms of cyberloafing: The role of norms and external locus of control	Blanchard & Henle	2008	172	2

Notes: TC = Total citations.

### **4.3. Most prolific authors**

The leading researchers could be identified through the analysis of author information, focusing on the number and citations of publications, and the ratio of citations/publications. Details of the 10 most prolific authors are presented in Table 2. Totally, 10 out of 1100 authors published at least three articles in this field, with minimum 20 citations of an author. The most prominent author, as per the table, is Judge, T.A., who has authored 3 articles with 2584 citations, followed by Spector, P.E., having 5 articles with 1822 citations. The results indicate that the studies on employee locus of control of these authors were comparatively hot, with relatively great influence and high levels of attention.

Table 2. Most prolific authors

Author	TP	TC	CPP
Judge, T.A.	3	2584	861.33
Spector, P.E.	5	1822	364.4
Cooper, C.L.	9	451	50.11
Keller, R.T.	3	176	58.67
Linz, S.J.	7	130	18.57
Semykina, A.	5	118	23.6
Jones, J.W.	3	102	34
Lau, B.	3	57	19
Ljoså, C.H.	3	57	19
Marchand, A.	4	31	7.75

Notes: TP = total publications; TC = Total citations;  
CPP = citation per publication.

Source: Authors

#### 4.4. Key journals

Analysis was extended to find out the top journals that published on the topic of employee locus of control. The results revealed that publications are distributed across a wide array of journals, covering different subjects, while the key journals belong to the domain of psychology. Only 11 journals have published five or more articles on the topic of employee locus of control; their details are presented in Table 3. One of the most straightforward observations from the results is that all top journals are ranked Q1 ( $n=9$ ) and Q2 ( $n=2$ ) by ScimagoJR. This is an indication that highly cited publications on the topic of employee locus of control generally come from top-ranked journals. Furthermore, almost all of SNIP (source normalised impact per publication) scores ( $n=10$ ) were greater than 1.00, indicating that the average citation per article in the journal is more than the citation potential of that journal in its subject field.

Table 3. Key journals

S. No.	Journal name	Based on publications included in the study			Based on all publications in the journal		
		TP	TC	CPP	CiteScore <sup>a</sup>	SNIP <sup>a</sup>	SJR <sup>a,b</sup>
1	Journal of Applied Psychology	14	3278	234.14	12.3	4.185	6.522, Q1
2	Psychological Reports	12	103	8.58	2.4	0.891	0.645, Q2
3	Journal of Managerial Psychology	9	956	106.22	3.1	1.069	0.878, Q1
4	Journal of Organizational Behavior	9	1164	129.33	11.8	3.598	3.938, Q1
5	Personality and Individual Differences	9	163	18.11	4.9	1.422	1.328, Q1
6	Work And Stress	9	704	78.22	7.7	2.682	1.91, Q1
7	Human Relations	7	294	42	7.1	2.992	2.91, Q1
8	Journal of Business Ethics	7	407	58.14	9	2.534	2.209, Q1
9	Frontiers in Psychology	5	36	7.2	3.5	1.46	0.947, Q2
10	Journal of Economic Psychology	5	175	35	3.4	1.375	1.114, Q1

11	Journal of Occupational Health Psychology	5	346	69.2	16.6	4.808	4.532, Q1
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Notes: TP = total publications; TC = total citations; CPP = citation per publication; SNIP = source normalised impact per paper; SJR = Scimago journal ranking; <sup>a</sup>Figures for 2020 provided by SCOPUS; <sup>b</sup>Quartiles data provided by ScimagoJR.  
Source: Authors

#### 4.5. Most prolific institutions/universities

An organization-wise analysis, presented in Table 4, showed that 10 institutions or universities (out of 844) have published at least two articles with minimum 30 citations. Taking into consideration that the majority of organizations (n=8) have published 2 articles, results have been listed according to the total number of citations. From results it is obvious that the Loyola University Chicago, USA was the most influential organization, as for two articles, there are 575 citations, i.e. 287.5 citations per publication.

Table 4. Most prolific institutions/universities

Institutions/Universities	TP	TC	CPP
Loyola University Chicago, Chicago, USA	2	575	287.5
John Molson School of Business, Concordia University, Montreal, Canada	2	465	232.5
University of Houston, USA	2	427	213.5
Department of Management, West Virginia University, Morgantown, USA	2	199	99.5
Arizona State University, USA	2	152	76
Manchester School of Management, University of Manchester, Institute of Science and Technology, UK	3	120	40
Taipei Municipal Bai-Ling Senior High School, Taipei, Taiwan	2	71	35.5
Department of Management Sciences, Hazara University, Mansehra, Pakistan	2	43	21.5
Department of Speech, Communication Sciences, and Theatre, St. John's University, Jamaica, NY, USA	2	38	19
Department of Economics, Michigan State University, East Lansing, Mi, USA	4	36	9

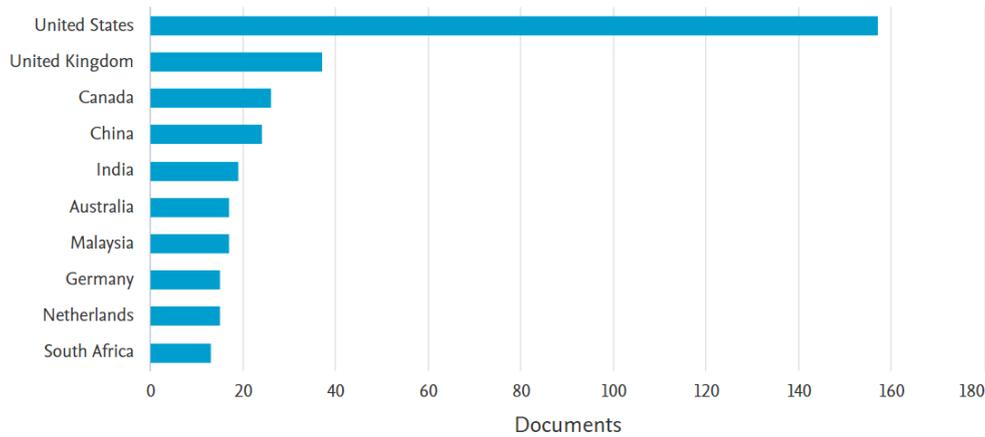
Notes: TP = total publications; TC = total citations; CPP = citation per publication.  
Source: Authors

#### 4.6. International contribution and collaboration of various countries

Table 5 and Figure 2 show the 10 most productive countries, with the USA having contributed significantly more than the rest of the countries, i.e. 158 publications, 10 387 citations, and an average number of citations per publication 65.74. The second most productive country is the UK with 37 publications, 1570 citations and 50.64 citations.

The collaboration network of countries was visualized by choosing “co-authorship” as the type of analysis, “countries” as a unit of analysis and a “full counting” as a counting method. 26 countries (out of 65) had at least five publications but only 23 countries were connected, as presented in Figure 3. The nodes of USA and China were the biggest, which means they had the closest collaboration with other countries. Furthermore, the link lines between the two of them were the thickest, representing the closest collaboration.

Figure 2. Top 10 most productive countries by the number of publications (Source: Scopus)



Source: Authors

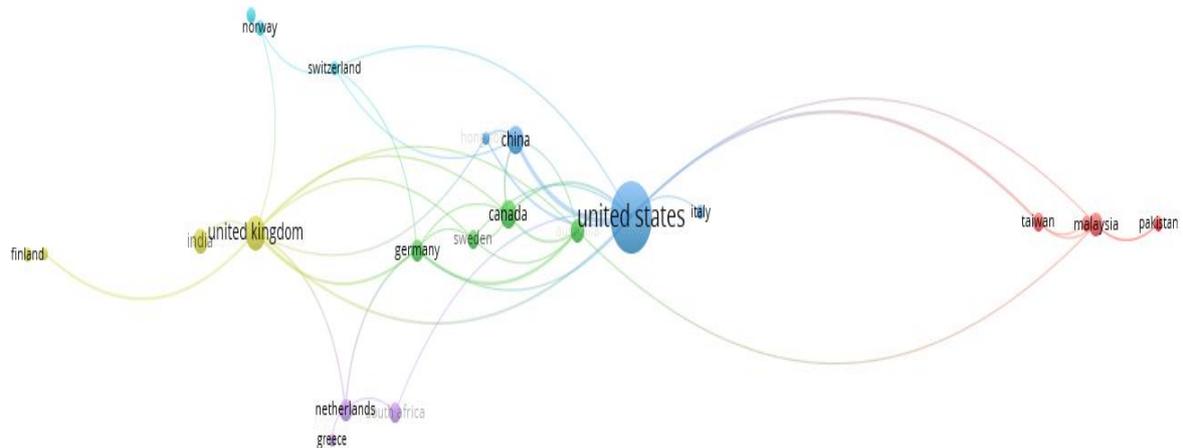
Table 5. Top 10 most productive countries

Country	TP	TC	CPP
<b>USA</b>	158	10387	65.74
<b>UK</b>	37	1570	42.43
<b>Canada</b>	25	1266	50.64
<b>China</b>	24	445	18.54
<b>India</b>	19	132	6.95
<b>Australia</b>	17	678	39.88
<b>Malaysia</b>	17	70	4.18
<b>Germany</b>	15	215	14.33
<b>Netherlands</b>	15	507	33.80
<b>South Africa</b>	13	146	11.23

Notes: TP = total publications; TC = Total citations; CPP = citation per publication.

Source: Authors

Figure 3. Collaboration network of countries based on the number of publications



#### 4.7. Research streams

To get a clearer picture of the domain and themes emerging in the research on employee locus of control, bibliographic coupling analysis was performed using VOS Viewer. While conducting bibliographic coupling, various units of analysis can be utilized, such as documents, journals, authors, institutes and countries (van Eck & Waltman, 2019). For this bibliographic coupling analysis, “documents” (i.e. articles or publications) was considered as the unit of analysis and the counting method used was “fractional counting”. Next, the minimum number of citations of a document was set to 100, which resulted in 33 documents, out of 436, meeting the threshold, out of which the largest set of connected items consisted of 29 documents. Bigger nodes designate greater significance of an article (van Eck & Waltman, 2010).

Figure 4 presents the results of the analysis. Six clusters, details of which are indicated in Table 6, have been retrieved out of this analysis. The first cluster is identified by red colour and contains 8 articles. The second cluster is represented by green colour, having 7 articles. The third cluster is identified with blue (5 articles), the fourth with yellow green colour (4 articles), the fifth represented with purple colour (3 articles) and the sixth with turquoise colour (2 articles).

The figure shows the presence of almost all of the seminal papers, i.e. the most cited papers, except the paper titled “Behavior in organizations as a function of employee's locus of control”, authored by Spector in 1982. It is important to highlight that as per Table 5, this paper has the maximum linkages with other articles (4 links). It can be stated that all these articles have foundational impact on this domain of study.

Table 6. Details of clusters derived by bibliographic coupling

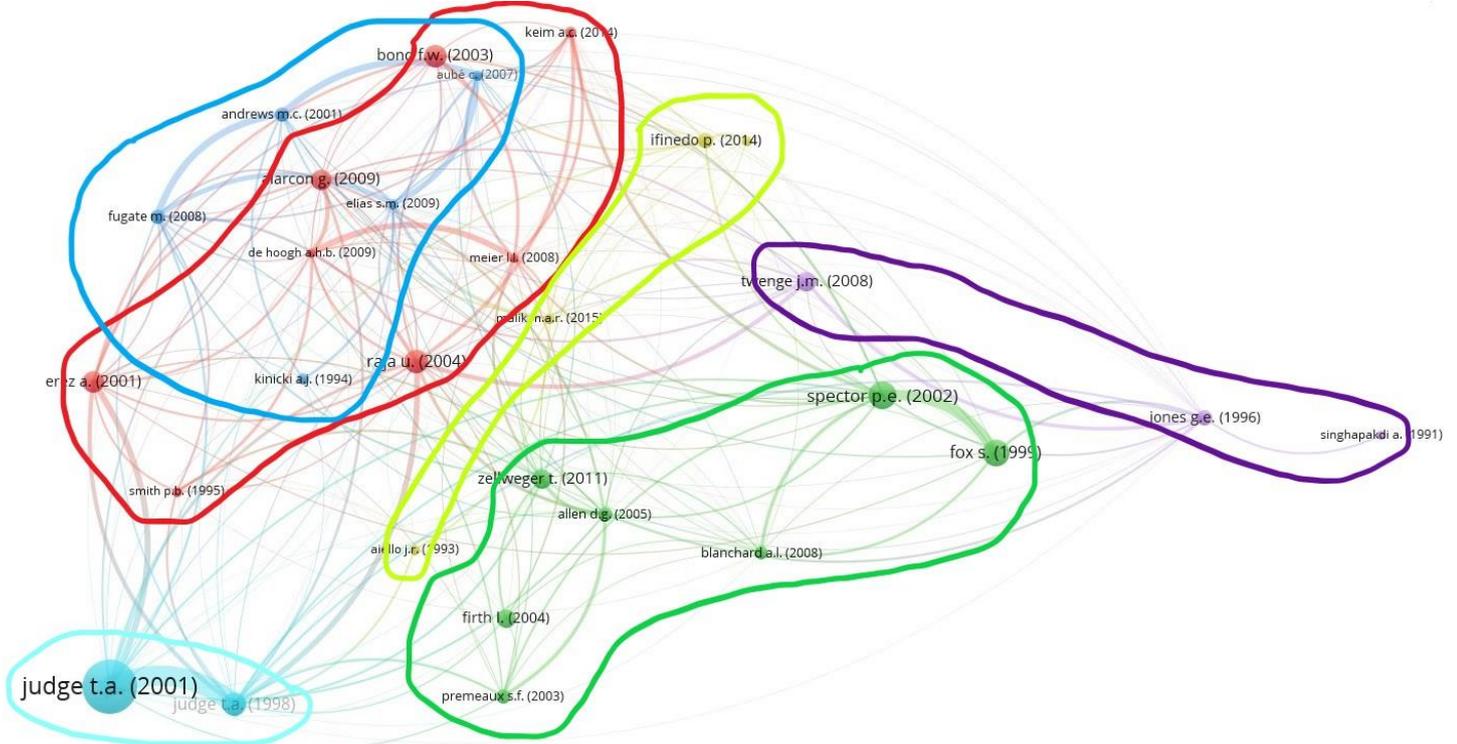
Cluster	Authors	Article	Year	Journal	TC
1	Alarcon, Eschleman & Bowling	Relationships between personality variables and burnout: A meta-analysis	2009	Work and Stress	347
	Bond & Bunce	The Role of Acceptance and Job Control in Mental Health, Job Satisfaction, and Work Performance	2003	Journal of Applied Psychology	408
	De Hoogh & Den Hartog	Neuroticism and Locus of Control as Moderators of the Relationships of Charismatic and Autocratic Leadership With Burnout	2009	Journal of Applied Psychology	103
	Erez & Judge	Relationship of core self-evaluations to goal setting, motivation, and performance	2001	Journal of Applied Psychology	396
	Keim, Landis, Pierce & Earnest	Why do employees worry about their jobs? A meta-analytic review of predictors of job insecurity	2014	Journal of Occupational Health Psychology	136
	Meier, Semmer, Elfering & Jacobshagen	The Double Meaning of Control: Three-Way Interactions Between Internal Resources, Job Control, and Stressors at Work	2008	Journal of Occupational Health Psychology	104
	Raja, Johns & Ntalianis	The impact of personality on psychological contracts	2004	Academy of Management Journal	438
	Smith, Trompenaars and Dugan	The Rotter Locus of Control Scale in 43 Countries: A Test of Cultural Relativity	1995	International Journal of Psychology	118
Allen, Weeks & Moffitt	Turnover intentions and voluntary turnover: The moderating roles of self-monitoring, locus of control, proactive personality, and risk aversion	2005	Journal of Applied Psychology	188	

2	Blanchard & Henle	Correlates of different forms of cyberloafing: The role of norms and external locus of control	2008	Computers in Human Behavior	172
	Firth, Mellor, Moore & Loquet	How can managers reduce employee intention to quit?	2004	Journal of Managerial Psychology	303
	Fox & Spector	A model of work frustration-aggression	1999	Journal of Organizational Behavior	533
	Premeaux & Bedeian	Breaking the silence: The moderating effects of self-monitoring in predicting speaking up in the workplace	2003	Journal of Management Studies	192
	Spector & Fox	An emotion-centered model of voluntary work behavior. Some parallels between counterproductive work behavior and organizational citizenship behavior	2002	Human Resource Management Review	571
	Zellweger, Sieger & Halter	Should I stay or should I go? Career choice intentions of students with family business background	2011	Journal of Business Venturing	323
3	Andrews & Kacmar	Discriminating among organizational politics, justice, and support	2001	Journal of Organizational Behavior	196
	Aubé, Rousseau & Morin	Perceived organizational support and organizational commitment: The moderating effect of locus of control and work autonomy	2007	Journal of Managerial Psychology	109
	Elias	Employee commitment in times of change: Assessing the importance of attitudes toward organizational change	2009	Journal of Management	112
	Fugate & Kinicki	A dispositional approach to employability: Development of a measure and test of implications for employee reactions to organizational change	2008	Journal of Occupational and Organizational Psychology	194
	Kinicki & Vecchio	Influences on the quality of supervisor-subordinate relations: The role of time-pressure, organizational commitment, and locus of control	1994	Journal of Organizational Behavior	136
4	Aiello & Svec	Computer Monitoring of Work Performance: Extending the Social Facilitation Framework to Electronic Presence	1993	Journal of Applied Social Psychology	111
	Fielding & Head	Determinants of young Australians' environmental actions: The role of responsibility attributions, locus of control, knowledge and attitudes	2012	Environmental Education Research	119
	Ifinedo	Information systems security policy compliance: An empirical study of the effects of socialisation, influence, and cognition	2014	Information and Management	218
	Malik, Butt & Choi	Rewards and employee creative performance: Moderating effects of creative self-efficacy, reward importance, and locus of control	2015	Journal of Organizational Behavior	109
5	Jones & Kavanagh	An experimental examination of the effects of individual and situational factors on unethical behavioral intentions in the workplace	1996	Journal of Business Ethics	213
	Singhapakdi & Vitell	Research note: Selected factors influencing marketers' deontological norms	1991	Journal of the Academy of Marketing Science	101
	Twenge & Campbell	Generational differences in psychological traits and their impact on the workplace	2008	Journal of Managerial Psychology	327
6	Judge & Bono	Relationship of core self-evaluations traits - Self-esteem, generalized self-efficacy, locus of control, and emotional stability - With job satisfaction and job performance: A meta-analysis	2001	Journal of Applied Psychology	1744
	Judge, Erez & Bono	The power of being positive: The relation between positive self-concept and job performance	1998	Human Performance	444

Notes: TC = Total citations.

Source: Authors

Figure 4. Bibliographic coupling network of publications on employee locus of control



Source: Authors

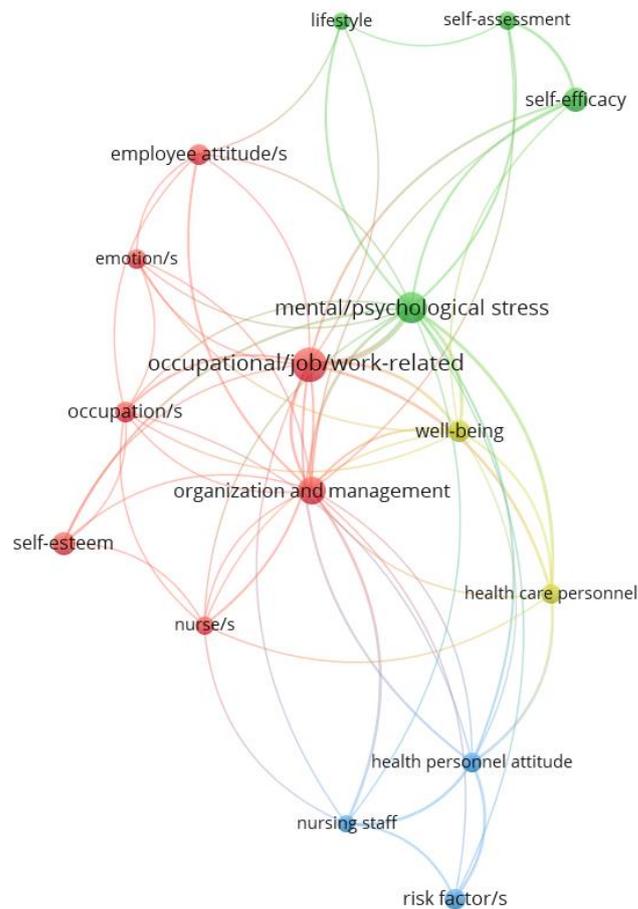
#### 4.8. Mapping the key concepts on employee locus of control

Bibliographic coupling enabled us to divide the content of the 436 documents into broad research streams. The next step was to find out the key concepts in the research of employee locus of control, i.e. to use the co-occurrence analysis of keywords in order to map the most frequently used and highly connected keywords for all 436 documents.

In VOS Viewer “co-occurrence” was selected as the type of analysis, “all keywords” (both author keywords and keywords assigned by the journals) as the unit of analysis and “full counting” as the counting method. Initially, the minimum occurrence of a keyword was set at 5 and 156 out of 1974 keywords met the threshold. Afterwards, a keyword thesaurus was created in order to balance the use of singulars and plurals of the same terms (e.g. “emotion” and “emotions” were both marked as “emotion/s”, “employee attitude” and “employee attitudes” as “employee attitude/s” etc.), and to avoid repetition of synonyms (e.g. both “attitude of health personnel” and “health personnel attitude” were marked as “health personnel attitude”, “self esteem” and “self-esteem” as “self-esteem” etc.). Next, a minimum of 5 shared keywords was selected as the threshold level, extracting 19 keywords out of 1674 using this process. While verifying the selected keywords, some general terms as “human/s” and “health survey/s” were omitted from the analysis, in order to get more precise mapping results. Finally, a total of 17 keywords were selected but only 16 were connected to each other. Keyword network consisted of four clusters, having 61 links, with the total link strength of 107. Figure 5 depicts the obtained four clusters. Keywords of the same colour belong to the same cluster.

The larger the nodes, the greater the significance (van Eck & Waltman, 2010). The clusters are distinguished by red, blue, green and yellow colours. The first cluster (marked in red) has a total of 7 keywords, i.e. emotion/s, employee attitude/s, nurse/s, occupation/s, occupational/job/work-related stress, organization and management, and self-esteem. The second cluster (green) has 4 keywords, i.e. lifestyle, mental/psychological stress, self-assessment and self-efficacy. The third cluster (blue colour) has 3 keywords, i.e. health personnel attitude, nursing staff and risk factor/s. The fourth cluster (yellow) has 2 keywords, i.e. health care personnel and well-being.

*Figure 5. Co-occurrence network of the most frequent keywords*



Source: Authors

## 5. Conclusions

The present study contributes to the understanding of employee locus of control, as it explores a profile of studies performed on it. According to the findings, studies on employee locus of control are on the rise over the years since 2006. Furthermore, the analysis revealed that the most prolific article was “Relationship of core self-evaluations traits – Self-esteem, generalized self-efficacy, locus of control, and emotional stability – With job satisfaction and job performance: A meta-analysis”, by Judge T.A. and Bono J.E., with the highest citation

number (TC = 1744). The analysis also discovered that the most prominent author was T.A. Judge, who has authored 3 articles with 2584 citations, followed by P.E. Spector, having 5 articles with 1822 citations. The most prolific journal was found to be Journal of Applied Psychology having published 14 articles in the field, having 3278 citations. Furthermore, the analysis also revealed that the Loyola University Chicago, USA was the most influential organization, as for two articles, there were 575 citations. Additionally, with 158 publications and 10 387 citations, the most productive country was the USA, and the closest collaboration was between the USA and China. With regard to the research streams in the research on employee LOC, bibliographic coupling network consisted of 29 documents in six clusters. Key concepts were found through a keyword co-occurrence network that was built out of 16 connected keywords, creating four clusters. For the future research it would be beneficial to concentrate on those hot trends and keywords, trying to establish collaborations with the most prominent institutes and authors and to publish the work in the most prolific journals.

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