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'What are psychology journals publishing about the world of work?': A systematised review

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Orientation: Work-related research from the perspective of psychology journal publications is reviewed, indicating research topic trends and research method use.

Research purpose: What psychology journals are publishing about work-related topics as well as how these topics are being investigated was indicated. The specific objectives of this study were to analyse what research methods are being used, how these methods are being used and for what topics in work-related research.

Motivation for the study: The lack of studies that investigate the use of research methods and work-related study themes from the perspective of miscellaneous psychology journals prompted this study.

Research approach/design and method: A systematised review design was followed based on data collected by a previous study. Work-related research articles (*n* = 73) from five top-tier international miscellaneous or general psychology journals (published between 2013 and 2017) were collected and categorised.

Main findings: Quantitative methods, convenience samples, cross-sectional designs and questionnaires for data collection as well as analysis of variance were the most frequently used methodologies. Workplace relationships, job search quality and re-employment and work stress were the most frequently investigated topics.

Practical/managerial implications: Researchers should pay attention to the areas that lack methodological transparency in their studies to address the replication crisis in psychology. Method use should be expanded beyond quantitative methods where applicable. Industrial and organisational psychologists are reminded of their identity as applied psychologists.

Contribution/value-add: The use of research methods in work-related research published by psychology journals is presented. Trends for this sample as well as areas for improving the replication crisis in psychology were identified.

Keywords: applied psychology; industrial and organisational psychology; psychology publication; research methodology; research trends; replication crisis; quantitative methods; convenience sampling.

Introduction

Orientation

The early concept of industrial and organisational (I-O) psychology was investigated by industrial engineers Frederick Winslow Taylor and Frank Gilbert (Tiemann, 2019). However, it was the 'people experts' (Tiemann, 2019, par. 4) from the field of psychology that finally created the applied psychology discipline (Cunningham, 2010; Kazi, 2012). It is speculated that the first book written about I-O psychology was written by a psychologist who had experienced work conflict with his Harvard colleagues, namely, Hugo Munsterberg (Landy & Conte, 2004). Munsterberg is seen as the 'first man to break the ice' (Moore & Hartmann, 1931, p. 4) between the world of work and psychology. He promoted the concept of addressing problems in industry through psychological methods (Schreuder, 2001). Then, the use of psychology in personnel recruitment further increased interest in the field (Schreuder, 2001). What followed was years of collaboration between the two fields to form what we now know as I-O psychology (Tiemann, 2019).

Industrial and organisational psychology typically applies theories and methods from the field of psychology to address issues in an organisational or work context (Tiemann, 2019), thereby making a key responsibility of industrial psychologists to conduct research through applying theories, knowledge and methods (Health Professions Council of South Africa [HPCSA], 2019).

However, the field of psychology as a whole is experiencing a crisis ('the replication crisis') of no confidence because of failure and a lack of replication studies (see Earp & Trafimow, 2015; Efendic & Van Zyl, 2019; Everett & Earp, 2015; Makel, Plucker, & Hegarty, 2012; Martin & Clarke, 2017; Open Science Collaboration, 2015). Concurrently, I-O psychology has also been scrutinised for its applied research practices and validity (Grand et al., 2018). The abilities to replicate and reproduce findings are pillars in psychology (Wiggins & Chrisopherson, 2019), supporting truth or validity in the claims of studies (Neuliep, 1991). However, continuous failures to replicate esteemed experiments (Open Science Collaboration, 2012, 2015) and an outbreak of fraudulent studies (e.g. Bem, 2011) throughout the last decade have led to unsettled scientific ground in the psychology community, with many deeming the situation a replication crisis (Wiggins & Chrisopherson, 2019). To counter the replication crisis, psychologists have focused on statistical and methodological reform and other problems in the field, namely, research and publication practices, statistical power, measurement, null hypothesis testing, replication and transparency (Wiggins & Chrisopherson, 2019).

Transparency with regard to methodology and data used go hand-in-hand with the reproducibility of psychology studies (Derksen, 2019), and the application of sound research methodology is critical for supporting the field of psychology as a scientific endeavour, as 'the method really matters for the science and therefore psychology' (Haig, 2018, p. 1). Scholtz, De Klerk and De Beer (2020) found that the broad field of psychology tends to utilise quantitative research methods above all other research methods (as defined by Nieuwenhuis, 2016) in a sample of five international journals. Furthermore, a lack of rigour by means of transparency of the used research method in articles was also indicated. The broad topic trends investigated by these five journals resulted in 10 areas of research in psychology (Weiten, 2012) of which the most popular research topic, namely, social psychology, included work-related articles.

Literature review

Topics investigated in I-O psychology specifically range from investigating industrial issues to how employees behave and function in their work environment (Tiemann, 2019). Topic trends in I-O psychology research typically concur and evolve with the current state of work, organisations, society and developments in the broader field of psychology (Kozlowski, 2017). In today's modern world, the area of work-related research is at a critical point of investigation as it is currently experiencing the Fourth Industrial Revolution through technology (Schwab, 2016). This revolution is considered the most important economic and societal development globally as it will change the fundamental nature of society, work and business (Arntz, Gregory, & Zierahn, 2016; Brynjolfsson & McAfee, 2014; Ford, 2015). Concurrently, the Society of Industrial and Organisational Psychology predicts that the research topic trends for 2020 will include data visualisation and communication, virtual working spaces, meaningful work, health and well-being at work, change of the nature of work and artificial intelligence, amongst others (see Haynes, 2020).

Previous academic studies have also investigated the occurrence of research trends in I-O psychology from various perspectives. A systematic review by Schreuder and Coetzee (2010) focused on topic trends in accordance with the sub-disciplines of industrial psychology as identified by the Health Professions Council of South Africa from 1950 to 2008. The main trends found during this period were that research in personnel psychology has declined over the years, whereas employee well-being and organisational psychology has increased proportionally (Schreuder & Coetzee, 2010). Coetzee (2019), on the other hand, provided a more recent overview of scholarly research trends in the *South African Journal of Industrial Psychology* specifically. Seven core domains of investigation were identified, which included scale development and measurement of individual and organisational behaviour as well as themes regarding diversity and themes about the societal context of people's behaviour (see Coetzee, 2019).

Research purpose and objectives

Despite I-O psychology's long history in the field of psychology research, a synthesis of work-related research from the perspective of broad psychology journals is lacking. Reviews tend to focus on synthesising articles concerned with work from specific I-O psychology journals or domains for the purpose of collecting discipline-specific articles. Reviews of work-related research can indicate where the field currently is, as well as provide recommendations for advancing the field (Casper, Eby, Bordeaux, Lockwood, & Lambert, 2007). In addition, the field of I-O psychology is experiencing new developments (because of the Fourth Industrial Revolution) and critique of its methods of application. Thus, an exploration into the current trends with regard to topics investigated and methodologies applied in work-related research is warranted. Review articles are further encouraged as a way to 'examine emergent methods as up-and-coming research tools or techniques (both quantitative and qualitative) that innovatively address complex organisational research problems and develop new knowledge' (Reio, 2009 as cited in Nimon, 2016, p. 457). Furthermore, Nimon (2016) identified the publication of articles, such as the current article, as a natural step in the development of a research field and that it may enhance the scientific rigour in the field. Thus, the current research study aims to contribute to the academic domain of I-O psychology by indicating work-related research trends through a systematised review of psychology journals. Therefore, the research question is, 'what are the work-related research trends investigated by miscellaneous international psychology journals?'

Work-related articles from data collected by Scholtz et al. (2020) were to reach the aim of this research study and the included sample is available at https://methodgarden.

xtrapolate.io/. They analysed a sample of 999 psychology articles across five miscellaneous top-tier international psychology journals published between 2013 and 2017 to reach the following objectives: *what research methods are being used, how these methods are being used and for what topics in practice* (i.e. journal publications). Data from their study were vast (included all topics in psychology, e.g., developmental psychology); however, results were only presented superficially. Work-related articles (*n* = 73) merely formed one code as part of a larger theme.

The previous study (Scholtz et al. 2020) discussed this theme in relation to the broad field of psychology and paid little attention to the articles these codes consisted of. The detailed content of these work-related articles, as well as their potential to provide I-O psychology insight, was therefore unused – thus allowing this research study the opportunity to provide unique insights through an in-depth presentation of work-related research articles, specifically. The specific objectives of this research study were the following: *what research methods are being used, how these methods are being used and for what topics in work-related research articles from miscellaneous psychology journals.* These objectives will make the contribution of this research study threefold. Firstly, the data will allow insight into the rigour applied in these articles. Secondly, methodological trends will be made apparent and, lastly, the work-related topics that are of interest to the broad field of psychology will be made visible.

This article is unique as it aims to explore research trends in the field of I-O psychology from the perspective of the broad field of psychology, and not only from I-O psychology-oriented journals, which allows for a synthesis of topics from a different perspective than previous reviews. Another possible unique contribution is that this investigation into work-related articles published in psychology journals can also indicate the interdisciplinary relationship between psychology fields. Interdisciplinary research, especially between scholars, is seen as imperative for societal well-being as various branches of knowledge are combined (Van Kerkhoff, 2014). In addition, the current research study has taken an exploratory approach to code and creating themes (categories) of the topic trends instead of using predefined categories. Lastly, this research study utilised a systematised review design, a design that is growing in popularity, thereby contributing to the use of this methodology in the field of psychology by increasing its exposure.

Research design

Review approach

A systematised review design was followed to collect data in this study, which consisted of the following: select sample (journals identified through SCImago journal country rank), apply inclusion criteria to journals and review sample, start data analysis (Title > Abstract > Full text) and cluster artciles/

codes under relevant sections (topics, methods and methodology). Lastly, produce findings in table format and write report (Scholtz et al., 2020). Systematised reviews are used to code and categorise data in tabular form in a systematic manner (Grant & Booth, 2009).

Sample

The journal sample for this research study was selected in 2018 through purposive sampling (Ritchie, Lewis, & Elam, 2009) and included journal articles published between 2013 and 2017 to present the most recent indication of research trends at the time of the research study (Lee, 2015). Journals were included in the sample if they formed part of the top five miscellaneous psychology journals ranked on the SCImago Country Journal Ranking website (SCImago Journal & Country Rank, 2017). SCImago presents a yearly list of journals based on Scopus® database, the largest database of peer-reviewed citations and abstracts globally (Scopus, 2017).

Journals were excluded if they provided no full-text access, focused on a specific discipline in psychology or indicated a preference for certain research methods. In addition, only empirical articles were included from these five journals. Thus, opinion pieces, book reviews and interview reports were excluded. These inclusion and exclusion criteria were deemed appropriate for the current research study because they allow the researchers to address the research question from the perspective of a broad recent sample of psychology journals.

The included journals were *British Journal of Psychology*, *Europe's Journal of Psychology*, *Journal of Psychology: Applied and Interdisciplinary*, *Australian Journal of Psychology* and the *International Journal of Psychology*. From these journals, 999 articles were collected of which only 73 articles focused on work-related research and therefore formed the sample for the current study.

Research procedure

The research procedure for this systematised review design was adapted from the work of Ferreira, Bessa, Drezett and De Abreu (2016), and aspects of rigour as identified by Johnston, Kelly, Hsieh, Skidmore and Wells (2019) were applied throughout the process.

Firstly, the systematised review procedure was approved by a research and ethics committee (Johnston et al., 2019) to increase the rigour of the research study.

After obtaining ethical approval in 2017, data collection commenced in 2018 and ended in 2019. A systematic process was followed to screen for eligible journals and articles by the first author and reviewed by the second and third authors (Johnston et al., 2019). Codes were derived from these articles manually (Grant & Booth, 2009) and an audit trail was created on a Microsoft Excel spreadsheet for this process (Bandara,

Furtmueller, Gorbacheva, Miskon, & Beekhuyzen, 2015; Johnston et al., 2019). During the coding process, an independent person acted as a co-coder. The coding process was guided by the research question (Johnston et al., 2019) and included the following: the design used, research topic (Bittermann & Fischer, 2018), sampling method (Ritchie et al., 2009), methods used (Nieuwenhuis, 2016) and methodology (data collection and data analysis [Maree, 2016]). Codes were assigned to articles based on the wording in each article. Then themes were created that resembled the codes. Themes and codes were also checked by the co-coder. Lastly, as per the systematised review design, the themes were categorised into a table format.

Ethical consideration

The original research study obtained from the Health Research Ethics Committee, Faculty of Health Sciences Ethics Office for Research Training and Support, North-West University, Potchefstroom Campus (clearance number: NWU-00115-17-A1) before the research commenced. The current research study still falls under this ethical clearance as it has merely provided in-depth information on the same objectives as the original research study using data that were collected and analysed by the original research study.

Results

Only 4% of the 73 articles included in this work-related research sample explicitly stated about the methods used in their studies, whereas 64% stated the used design. Furthermore, it is important to note that the frequency amount totals in these results refer to the occurrence of the concerned methodology in this sample and will therefore not amount to the article total as articles would often include more than one sampling or data collection or analysis or design. Lastly, the listed methodology has been identified in accordance with the wording used in the articles.

Overall, the *Journal of Psychology: Applied and Interdisciplinary* published the most work-related research, having almost double the number of articles as that published in *Europe's Journal of Psychology*, which had the second highest amount (see Table 1).

With regard to specific research objectives, the results indicated the following: Firstly, the results showed that the quantitative research method was employed in 97% of work-related research articles published in the selected psychology journals, whilst only 1% of articles utilised a qualitative, review and mixed-method design each. There were no multi-method studies in this sample (see Table 2).

TABLE 1: Work code frequency in journals.

Journal	ƒ
Journal of Psychology: Applied and Interdisciplinary	33
Europe's Journal of Psychology	17
International Journal of Psychology	16
Australian Journal of Psychology	6
British Journal of Psychology	1

ƒ, frequency.

Secondly, the methodology utilised in the included sample of work-related research articles consisted of the following: design, sampling, data collection and data analysis.

Design

The designs applied in this research study concurred with the frequency of methods used, namely, that 59% of studies applied a cross-sectional design, 20% used a non-experimental design and 9% used experimental designs. The mixed-method study included in this research study used an ethnographic and cross-sectional design. Whilst the review merely indicated using a literature review, the qualitative method did not state its design (see Table 3).

Sampling

Most studies did not indicate their sampling method; however, some forms of inclusion and exclusion criteria were mentioned. Of those that had indicated, the convenience sampling method was the most popular method (used by 11% of studies), whereas stratified, snowball and random sampling methods each had a frequency of 3%. Sample sizes in the studies varied, ranging from 23 to 13 853 participants, with a mean of 749 and median of 310–312 participants. The modal samples were 242, 250, 266 and 290, each occurring twice in this sample (see Table 4).

Data collection

Data collection followed questionnaires for 85% and experimental tasks for 6% of the collection methods,

TABLE 2: Method use in sample frequency.

Methods	ƒ
Quantitative	70
Qualitative	1
Mixed-methods design	1
Review	1

ƒ, frequency.

TABLE 3: Design use in sample frequency.

Design	ƒ
Cross-sectional design	44
Non-experimental design	15
Experimental design	7
Correlational design	3
Longitudinal design	2
Literature review	1
Not stated	1
Ethnography	1

ƒ, frequency.

TABLE 4: Sampling method use frequency.

Sampling	ƒ
Not stated	59
Convenience sampling	8
Stratified sampling	2
Random sampling	2
Snowball sampling	2
Probability sampling	1
Non-probability sampling	1

ƒ, frequency.

TABLE 5: Data collection method frequency.

Data collection	ƒ
Questionnaire	68
Experimental task	5
Interview	4
Cognitive ability test	1
Online scholarly literature	1
Documents	1

ƒ, frequency

TABLE 6: Data analysis in sample frequency.

Data analysis	ƒ
Analysis of variance (ANOVA)	76
Descriptive statistics	60
Confirmatory factor analysis (CFA)	60
Correlation analysis	34
Common method variance (CMV)	13
Bootstrapping	11
Correlation analysis	10
Chi-squared tests	8
Repeated measures analysis of variance (RANOVA)	6
Hierarchical linear regression analysis	5
T-test analysis	4
Structural analysis	3
Moderated regressions	3
Multiple regression analysis	3
Maximum likelihood method	3
Word analysis	2
Discursive psychology	2
Structural equation modelling (SEM)	2
Within-subject Helmert contrasts	2
Maximum-likelihood factor analysis with promax rotation	2
Mixed ANOVA	2
Factor analysis	2
Sobel test	2
Two-way ANOVA	2
Logistic regression analyses	2
Frequency rate	2
Univariate generalised linear models (GLMs)	2
Stepwise multiple regression analysis	2
Mann–Whitney U tests	1
Z-scores	1
Multiple mediator analyses	1
Wilcoxon's signed-rank test	1
Analysis of covariance (ANCOVA)	1
Cohen's d effect size	1
Multilevel analysis	1
Item fit analysis	1
Pairwise parameter comparison	1
Moderated regression analysis	1
Z statistic	1
Sequential multiple mediation analysis	1
Variance covariance matrix	1
Multiple-group confirmatory factor analysis (MGCFA)	1
Latent profile analysis (LPA)	1
Latent class differentiation (LCD)	1
Common method bias test	1
Receiver operating characteristic (ROC) curve analysis	1
Categorisation	1
Multivariate tests	1
Meta-analysis	1
Multidimensional scaling	1
Multilevel structural equation modelling (MSEM)	1

ƒ, frequency.

concurring with the high frequency of quantitative methods. Interviews were also popular in this sample, amounting to 6% of the data collection methods (see Table 5).

Data analysis

Analysis of variance was one of the most frequently used methods of data analysis (21.8%), followed by descriptive statistics (17.20%), confirmatory factor analysis (17.0%) and correlational analysis (8.9%). The remainder of the data analysis techniques is presented in Table 6.

Lastly, the topics that were investigated by the included work-related articles focused on combining work-related aspects with that from psychology. For example, the article by Helmes and Fudge (2017) investigated a combination of psychological distress and unemployment. Coding of articles therefore firstly focused on work-related aspects and themes were formulated based on these work codes. After creating themes, the psychological aspects addressed within these themes were identified, resulting in 13 work themes and their included psychological aspects (see Table 7).

Discussion
Outline of results

This research study aimed to gain insights into the work-related research trends investigated by miscellaneous international psychology journals. Research method trends that were followed in these articles were mainly quantitative research methods, whilst qualitative, mixed methods and reviews only made up 3% of the articles.

Despite some growth in qualitative research in psychology, Pratt and Bonaccio (2016) found little evidence of this growth in I-O psychology, supporting the low frequency of qualitative methods found in this study.

O'Neil and Koekemoer (2016) and Coetzee and Van Zyl (2014) also found quantitative methods to be dominant in South African I-O psychology research. The reason for I-O psychologists' preference for quantitative methods over qualitative methods could be because of qualitative method's strength in realism but low precision and generalisability of results (Pratt & Bonaccio, 2016). However, despite the shortcomings of qualitative research, Pratt and Bonaccio (2016) highlighted various reasons that I-O psychology should apply this method, for example, creating new theories that are adapted to the changes in organisations or team science (Solis, Aristomene, Feitosa, & Smith, 2016). In contrast, Burlacu (2016) supported the continuation of quantitative methods and reminded that I-O psychologists are in charge of measuring performance and variables that influence performance as this impacts organisation and that measurement should be conducted in a common systematic numerical manner.

The manner in which these methods were employed in the sampled articles highlights a critical aspect in psychology today, namely, that of transparency, rigour and replication.

TABLE 7: Work-related themes and the psychology concepts as investigated by sampled articles.

Work theme	Psychology aspects	ƒ
Job search quality and re-employment	Cognitive (search for work self-efficacy) and non-cognitive components (psychological well-being), motivation, psychological distress, psychological readiness (computer simulation), personality and counterproductive work behaviours (*job search*). Core self-evaluations, personality and counterproductive work behaviours (*job insecurity*). Psychosocial contact (*retirement*). Psychological health (*unemployment*). Internal service quality, political skill, dark side of work engagement, test trials and processing, and mentoring (*influenced turnover and retention*).	14
Workplace relationships	Perception differences of workplace behaviour, autonomy and career support, holistic supervision, supervisor support and abuse, psychological safety, bystander helping behaviour, personality and cultural aspects, civility norms and safety motivation.	13
Work stress	Technostress, PTSD, burnout and anxiety (*outcomes of work stress*). Work, age and occupational future time perspective (OFTP) or career resilience (*strategy to cope with work stress*). Stressful challenges and role stress (*promote work engagement*).	8
Organisational and personal Identity	Citizenship behaviour (CCB) and organisational citizenship behaviour (OCB), emotional dissonance, dark personality types in searching for resources and demands, mindset of commitment and motivation, psychological empowerment (*influenced organisation identity*). Job security and heightened performance (*outcome of identifying with your organisation*).	7
Work beliefs	Perception of self and employment (*influenced beliefs*), flow, work interruptions with general health, well-being and reports of psychosomatic symptoms (*outcomes of work beliefs*). Collective efficacy beliefs, conspiracy beliefs and cynicism (*types of beliefs*).	6
Work–life balance (WLB)	Perception of self and employment, psychosomatic symptoms, family boundaries, positive orientation (life and self, etc.) and family support (*influenced WLB*). Work–school conflict, health and well-being (*outcomes of WLB*).	6
Work commitment and motivation	Perception of career support and autonomy, civility norms and psychological empowerment (*promoted commitment and motivation*). Managers' commitment promoted positive worker attitudes and behaviour (*outcomes of commitment and motivation*).	5
Job performance	Impression management tactics, positive psychosocial factors, emotional intelligence, authenticity at work and self-efficacy (*influenced job performance*).	5
Job satisfaction	Turnover and performance (*outcome of job satisfaction*). Emotional labour (public service motivation [PSM]) and graduate employability (*influence job satisfaction*). Testing measures for teacher job satisfaction.	4
Burnout	Job characteristics (pay, motivation and EQ), management of daily basic needs, perceived psychological contract breach and felt violation (*influenced burnout*).	3
Cultural differences in work	Indigenous values, organisational citizenship, cultural family variables and unemployment.	3
Mental illness	Psychiatric symptomatology and scoring guidelines of dysfunction measure, neurocognitive functioning and bipolar disorder.	2
Affect and emotional intelligence	Mentoring experiences and creative self-efficacy, locus of control and organisational citizenship behaviours (*influenced by affect and EQ*).	2

EQ, emotional intelligence; PTSD; post-traumatic stress disorder.

Only 1% of studies in psychology are replication studies (Makel et al., 2012), and the trustworthiness of I-O psychology research is still of critical concern (see Kepes, Bennett, & McDaniel, 2013). Hardwicke et al. (2018) further supported this result and stated that articles often lack the basic methodological steps followed in I-O psychology research. According to Grand et al. (2018), robust science in I-O psychology is fostered through six principles, of which transparency, rigour and replication are three. These principles are not only the sole responsibility of the authors but also the reviewers of these articles (Grand et al., 2018). Schmidt and Landers (2013) added that despite the importance placed on replication studies, these studies are not incentivised by journals or rationally desirable for I-O psychology academics. Makel et al. (2012, p. 537) stated that researchers in psychology may be hesitant to conduct replication studies as they are often looked down for not contributing knowledge to the field and therefore labelled as 'bricklayers'.

Furthermore, researchers also experience pressure to reach certain outcomes, whereas getting published may trump research accuracy (Derksen, 2019; Nosek, Spies, & Motyl, 2012). This could possibly hinder transparency (Derksen, 2019) and explain the lack of methodological rigour in articles. Hoole (2019) also presented a more holistic perspective on the replication crisis and listed research methodology, ethics, policies and systemic or institutional aspects as root causes. However, stating the research methodology along with its research question, amongst other methodological steps, still forms the cornerstones of transparent research, and a lack thereof challenges the robust science of I-O psychology (Open Science Collaboration, 2015). Therefore, McAbee, Grubbs and Zickar (2018) identified open science and transparency as critical elements in the applied research process to increase the scientific robustness of I-O psychology.

Following the lack of transparency overall, the applied sampling method, in the included articles, indicated minimal information about the used sample and identified no sampling strategy. The lack of identifying the population along with the appropriate justified sampling strategy to draw a sample representatively has long needed attention in I-O psychology (Fisher & Sandell, 2015). Despite this lack of transparency, the most widely reported sampling method found in this sample of articles was convenience sampling. The use of convenience samples is habitual in psychology and requires a clear statement about the limitations of its use in studies (Nielsen, Haun, Kärtner, & Legare, 2017). The results indicated that sample sizes varied in this sample, and its applicability is generally determined by the hypothesis or aim of the specific study (Michel, Hartman, O'Neill, Lorys, & Chen, 2016). With regard to the designs used in this sample, the results concurred with the high frequency of quantitative research in that cross-sectional design was the most frequently applied design. Despite the view that longitudinal designs provide more causal results, Spector (2019) stated that it has a limited advantage over cross-sectional designs. Its popularity can be seen throughout organisational psychology history (Spector, 2019) and the current results and will most likely continue.

Questionnaires, whether online or paper-based, are a popular choice in cross-sectional designs for data collection (Spector, 2019). The high frequency of questionnaires is also a testament to the lack of qualitative methods in this sample. Data analysis consisted of a wide variety of techniques, as can be seen in Table 6. The analysis of variance method was used in most of the studies.

Lastly, the data indicated 13 work-related research topics that are of interest to the broad field of psychology based on

the sampled journals. As can be seen from Table 7, the integration of psychological concepts with that of work still holds true to the long history of interactive research that prompted the development of I-O psychology. A strong focus on individual inter- and intrapersonal experiences was found in this sample of psychology journals. This is evident by the three highest occurring themes: job search quality and re-employment, workplace relationships and work stress. These topics concur with previous research; for example, Bliese, Edwards and Sonnetag (2017) traced research on work stress in psychology back to 1917 and found that trends in work stress research are driven by interesting propositions created by I-O psychology theorists. Concurrently, with regard to the psychology concepts found in work-related themes overall, health and well-being were central to most articles, which were also found in current I-O psychology trends (Haynes, 2020) and previous research (Coetzee, 2019). Addressing mental health issues in a culturally sensitive manner is a 2020 research trend for the American Psychological Association (Weir, 2020). Cultural influences were considered across most themes found in this sample, highlighting the role and topic of diversity in I-O psychology (Coetzee, 2019). Thus, these work-related articles highlight the part of industrial psychology concerned with behaviour and functioning of employees in their work environment (Tiemann, 2019).

Limited attention was found to be given to work environments or the influence of technology in the sampled articles, which was surprising as these are the most significant current development in the field (Schwab, 2016). Only two studies focused on technology and included technostress (Salanova, Llorens, & Cifre, 2013) and the role of computer simulation in psychological readiness for work interviews (Aysina, Efremova, Maksimenko, & Nikiforov, 2017). The included studies, being from broad psychology journals, were less concerned with the changes in the world of work and more concerned with the psychological experiences of the role-players of work, which, according to Cunningham (2010), should be promoted to maintain the identity of I-O psychology. Cunningham (2010) highlighted the psychological underpinning of I-O psychologists and identified the in-depth understanding of persons' behaviours in their implications and how individual emotions, thoughts and attitudes influence those behaviours as core interests of I-O psychologists. These core interests are highlighted by the identified themes.

Practical implications

The practical implications of this study suggest that researchers and reviewers should pay more attention to the transparency of their used methodology in publication, as this influences replication (Open Science Collaboration, 2015). The lack of rigour found in this study is especially concerning because of the sampled journals being at the top of psychology research and serves as examples to other

journals and researchers. The current replication crisis debilitates the scientific basis of I-O psychology and psychology as a whole. Therefore, this study should be used as motivation and a clear mirror for the methodological areas that lack rigorous publication. Furthermore, the high frequency of quantitative methods as well as a clear gap for work-related research to utilise other methods is presented. Industrial and organisational psychologists should therefore use this as a base to expand I-O psychology methodology to include other methods.

Using the insights of topics published in top-tier international psychology journals may increase South African I-O psychologists' contribution to the global knowledge economy through increasing publication. The occurrence of 'cultural influences' in many of the work-related themes serves as a clear example of such a publication opportunity. South African workplaces are often culturally diverse and the 2020 research trends identified by the American Psychological Association highlight South Africa specifically as a country where psychological services should be adapted (Weir, 2020). Furthermore, the knowledge of the type of research methodology that is frequently used in research provides academia with a view of what skills future I-O psychology researchers may require to take part in international psychology publishing. Industrial and organisational psychology in South Africa can also use this study to evaluate its own methodological rigour and transparency in articles as a way to address the replication crisis in psychology. Including more detail on sampling, especially with South African samples, may be an opportunity where research articles can increase rigour, possibilities for effective replication and international publication of South African studies.

Viewing work-related articles from a psychology journal perspective reinforced that I-O psychology has psychology at its core and should serve as a reminder of I-O psychology's history and current interactive relationship with psychology. Lastly, the lack of methodological transparency found in the selected sample serves as a reminder of the critical role reviews play in research. The effectiveness of the systematised review design is also indicated and lends support for its design through this study and its use in future research.

Limitations and recommendations

The first limitation of this study is that the data presented are based on that identified by authors in their articles. Thus, certain methodology could have been used in articles but not stated, and the results should be viewed as such. This, however, supports literature about the lack of transparency in psychology. Secondly, this article focused on a sample of five international journals, and although these journals did not indicate any preference for certain methods or topics, potential bias should still be considered. In addition, the results should also be viewed in the context of the sampled psychology journals. A different sample of journals could provide different

insights, especially with regard to research topics as topics may change in accordance with developments in the world of work. Researchers are therefore encouraged to continuously take stock of developments in I-O psychology research.

Based on the results of this study, it is recommended that the lack of rigour and transparency in studies should be explored, especially with regard to why this is occurring and what the impact is on the field.

Further studies utilising different review methods and a larger sample are encouraged to add a different perspective to the aim of this study. From the results, it is clear that quantitative methods are the method of choice whilst conducting work-related research, and the possible expansion of different methods in the field should be investigated. It has also become apparent that reviews of this nature are critical to highlight the areas that could improve the scientific rigour of a field. Furthermore, because of the replication crisis and the lack of rigour in the included articles, the authors encourage more reports of rigour and replication studies to be included in journals to address this problem (Schmidt & Landers, 2013). Lastly, the pursuit of I-O psychology as a psychology endeavour is encouraged, and more research delving deeper into the inner workings of employees should be considered. The continuation of merging of work from other disciplines could assist the field of I-O psychology in becoming more future-facing and can proactively identify upcoming trends (Morelli, Illingworth, & Handler, 2015).

Conclusion

This article showed the trends and developments in I-O psychology from the perspective of psychology journals. The trends in methodological use and topics that were investigated provide a base for future research and the development of these aspects in the field of I-O psychology. Methodological areas that lack rigour and transparency were noted and future research should investigate this aspect further to address the replication crisis. The work-related topics investigated by the included psychology journals highlight the interactive relationship between psychology and its applied counterpart. This should serve as a reminder of the psychology origin and core of I-O psychology.

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The authors have declared that no competing interest exists.

Authors' contributions

All authors conceptualised the article. The manuscript was written by S.E.S. and critically reviewed by L.T.d.B. and W.d.K.

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Data availability statement

The data that support the results of this study are available from the corresponding author (S.E.S.) upon reasonable request.

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References

Arntz, M.T., Gregory, T., & Zierahn, U. (2016). *The risk of automation for jobs in OECD countries: A comparative analysis (OECD Social, Employment and Migration Working Papers, No. 189)*. Paris: OECD Publishing. https://doi.org/10.1787/5jlz9h56dvq7-en

Aysina, R.M., Efremova, G.I., Maksimenko, Z.A., & Nikiforov, M.V. (2017). Using a computer simulation to improve psychological readiness for job interviewing in unemployed individuals of pre-retirement age. *Europe's Journal of Psychology, 13*(2), 251. https://doi.org/10.5964/ejop.v13i2.1250

Bandara, W., Furtmueller, E., Gorbacheva, E., Miskon, S., & Beekhuyzen, J. (2015). Achieving rigor in literature reviews: Insights from qualitative data analysis and tool-support. *Communications of the Association for Information Systems, 37*, 154–204. https://doi.org/10.17705/1CAIS.03708

Bem, D.J. (2011). Feeling the future: Experimental evidence for anomalous retroactive influences on cognition and affect. *Journal of Personality and Social Psychology, 100*, 407–425. https://doi.org/10.1037/a0021524

Bliese, P.D., Edwards, J.R., & Sonnetag, S. (2017). Stress and well-being at work: A century of empirical trends reflecting theoretical and societal influences. *Journal of Applied Psychology, 102*(3), 389–402. https://doi.org/10.1037/apl0000109

Bittermann, A., & Fischer, A. (2018). How to identify hot topics in psychology using topic modeling. *Zeitschrift für Psychologie, 226*, 3–13. https://doi.org/10.1027/2151-2604/a000318

Brynjolfsson, E., & McAfee, A. (2014). *The second machine age: Work, progress, and pro-sperity in a time of brilliant technologies*. New York, NY: Norton.

Burlacu, G. (2016). Eliminating a quantitative measure of performance means our science is starting from square one. *Industrial and Organizational Psychology, 9*(2), 342–343. https://doi.org/10.1017/iop.2016.22

Casper, W.J., Eby, L.T., Bordeaux, C., Lockwood, A., & Lambert, D. (2007). A review of research methods in IO/OB work-family research. *The Journal of Applied Psychology, 92*(1), 28–43. https://doi.org/10.1037/0021-9010.92.1.28

Coetzee, M. (2019). SA Journal of Industrial Psychology: Annual editorial overview 2019. *South African Journal of Industrial Psychology, 45*, 1741. https://doi.org/10.4102/sajip.v45i0.1741

Coetzee, M., & Van Zyl, L.E. (2014). A review of a decade's scholarly publications (2004–2013) in the South African Journal of Industrial Psychology. *South African Journal of Industrial Psychology, 40*, 1–16. https://doi.org/10.4102/sajip.v40i1.1227

Cunningham, C.J. (2010). You lost me at hello: Aren't we IO psychologists still? *Industrial and Organizational Psychology, 3*(3), 262–265. https://doi.org/10.1111/j.1754-9434.2010.01235.x

Derksen, M. (2019). Open psychology: Transparency and reproducibility. *Psicologia, Conocimiento y Sociedad, 9*(2). https://doi.org/10.26864/pcs.v9.n2.13

Efendic, E., & Van Zyl, L.E. (2019). On reproducibility and replicability: Arguing for open science practices and methodological improvements at the South African Journal of Industrial Psychology. *South African Journal of Industrial Psychology, 45*, 1–10. https://doi.org/10.4102/sajip.v45i0.1607

Earp, B.D., & Trafimow, D. (2015). Replication, falsification, and the crisis of confidence in social psychology. *Frontiers in Psychology, 6*(621), 1–11. https://doi.org/10.3389/fpsyg.2015.00621

Everett, J.A., & Earp, B.D. (2015). A tragedy of the (academic) commons: Interpreting the replication crisis in psychology as a social dilemma for early-career researchers. *Frontiers in Psychology, 6*(1152), 1–4. https://doi.org/10.3389/fpsyg.2015.01152

Ferreira, A.L.L., Bessa, M.M.M., Drezett, J., & De Abreu, L.C. (2016). Quality of life of the woman carrier of endometriosis: Systematized review. *Reprodução & Climatério, 31*, 48–54. https://doi.org/10.1016/j.recli.2015.12.002

Ford, M. (2015). *Rise of the robots: Technology and the threat of a jobless future*. New York, NY: Basic Books.

Grand, J.A., Rogelberg, S.G., Allen, T.D., Landis, R.S., Reynolds, D.H., Scott, J.C., … Truxillo, D.M. (2018). A systems-based approach to fostering robust science in industrial-organizational psychology. *Industrial and Organizational Psychology, 11*, 4–42. https://doi.org/10.1017/iop.2017.55

Grant, M.J., & Booth, A. (2009). A typology of reviews: An analysis of 14 review types and associated methodologies. *Health Information & Libraries Journal, 26*(2), 91–108. https://doi.org/10.1111/j.1471-1842.2009.00848.x

Fisher, G.G., & Sandell, K. (2015). Sampling in industrial and organizational psychology research: Now what? *Industrial and Organizational Psychology, 8*(2), 232–237. https://doi.org/10.1017/iop.2015.31

Haig, B.D. (2018). The importance of scientific method for psychological science. *Psychology Crime and Law, 25*(6), 1–28. https://doi.org/10.1080/1068316X.2018.1557181

Hardwicke, T.E., Mathur, M.B., MacDonald, K.E., Nilsonne, G., Banks, G.C., Kidwell, M.C., … Frank, M. C. (2018). Data availability, reusability, and analytic reproducibility: Evaluating the impact of a mandatory open data policy at the journal Cognition. *Royal Society Open Science, 5*(8), 1–18. https://doi.org/10.1098/rsos.180448

Haynes, M. (2020). *Top 10 workplace trends for 2020.* Retrieved from https://www.siop.org/Research-Publications/Items-of-Interest/ArtMID/19366/ArticleID/3361/Top-10-Workplace-Trends-for-2020?utm_source=SIOP&utm_medium=Website&utm_campaign=Top10page.

Health Professions Council of South Africa [HPCSA]. (2019). *Minimum standards for the training of industrial psychology.* Retrieved from https://www.hpcsa.co.za/?contentId=0&menuSubId=52&actionName=Professional%20Boards.

Helmes, E., & Fudge, M.A. (2017). Psychological distress among Australian welfare recipient job seekers. *Australian Journal of Psychology, 69*(2), 106–111. https://doi.org/10.1111/ajpy.12123

Hoole, C. (2019). Avoiding the elephant in the room: The real reasons behind our research crisis. *South African Journal of Industrial Psychology*, *45*(0), a1723. https://doi.org/10.4102/sajip.v45i0.1723

Johnston, A., Kelly, S.E., Hsieh, S.C., Skidmore, B., & Wells, G.A. (2019). Systematic reviews of clinical practice guidelines: A methodological guide. *Journal of Clinical Epidemiology, 108*, 64–72. https://doi.org/10.1016/j.jclinepi.2018.11.030

Kazi, T.B. (2012). A brief history of industrial psychology. *Inquiries Journal/Student Pulse, 4*(1). Retrieved from http://www.inquiriesjournal.com/a?id=1685.

Kepes, S., Bennett, A.A., & McDaniel, M.A. (2014). Evidence-based management and the trustworthiness of our cumulative scientific knowledge: Implications for teaching, research, and practice. *Academy of Management Learning & Education, 13*(3), 446–466. https://doi.org/10.5465/amle.2013.0193

Kozlowski, S.W.J. (2017). Reflections on the Journal of Applied Psychology for 2009 to 2014: Infrastructure, operations, innovations, impact, evolution, and desirable directions. *Journal of Applied Psychology, 102*, 580–588. https://doi.org/10.1037/apl0000191

Landy, F.J., & Conte, J.M. (2004). *Work in the 21st century: An introduction to industrial and organisational psychology*. New York, NY: McGraw-Hill.

Lee, C. (2015). *The myth of the off-limits source.* Retrieved from http://blog.apastyle.org/apastyle/research/

Makel, M.C., Plucker, J.A., & Hegarty, B. (2012). Replications in psychology research: How often do they really occur? *Perspectives on Psychological Science, 7*, 537–542. https://doi.org/10.1177/1745691612460688

Maree, K. (2016). Planning a research proposal. In K. Maree (Eds.), *First steps in research* (2nd ed. pp. 49–70). Pretoria: Van Schaik Publishers.

Martin, G.N., & Clarke, R.M. (2017). Are psychology journals anti-replication? A snapshot of editorial practices. *Frontiers in Psychology, 8*(523), 1–6. https://doi.org/10.3389/fpsyg.2017.00523

McAbee, S.T., Grubbs, J.B., & Zickar, M.J. (2018). Open science is robust science. *Industrial and Organizational Psychology, 11*, 54–61. https://doi.org/10.1017/iop.2017.85

Michel, J.S., Hartman, P., O'Neill, S.K., Lorys, A., & Chen, P.Y. (2016). Sample adequacy and implications for occupational health psychology research. *Industrial and Organizational Psychology, 9*, 193–197. https://doi.org/10.1017/iop.2015.135

Moore, B.V., & Hartmann, G.W. (1931). *Readings in industrial psychology*. New York, NY: D Appleton and Company.

Morelli, N., Illingworth, A.J., & Handler, C. (2015). Questions about IO psychology's future. *Industrial and Organizational Psychology, 8*(2), 269–276. https://doi.org/10.1017/iop.2015.32

Neuliep, J.W. (1991). *Replication research in the social sciences*. Newbury Park, CA: Sage.

Nielsen, M., Haun, D., Kärtner, J., & Legare, C.H. (2017). The persistent sampling bias in developmental psychology: A call to action. *Journal of Experimental Child Psychology, 162*, 31–38. https://doi.org/10.1016/j.jecp.2017.04.017

Nieuwenhuis, J. (2016). Qualitative research designs and data-gathering techniques. In K. Maree (Eds.), *First steps in research* (2nd ed. pp. 71–102). Pretoria: Van Schaik Publishers.

Nimon, K. (2016). Methods matter: Call for research methods submissions. *Human Resource Development Quarterly, 27*(4), 457–459. https://doi.org/10.1002/hrdq.21264

Nosek, B.A., Spies, J.R., & Motyl, M. (2012). Scientific Utopia: II. Restructuring incentives and practices to promote truth over publishability. *Perspectives on Psychological Science, 7*(6), 615–631. https://doi.org/10.1177/1745691612459058

O'Neil, S., & Koekemoer, E. (2016). Two decades of qualitative research in psychology, industrial and organisational psychology and human resource management within South Africa: A critical review. *South African Journal of Industrial Psychology, 42*, 1–16. https://doi.org/10.4102/sajip.v42i1.1350

Open Science Collaboration. (2012). An open, large scale, collaborative effort to estimate the reproducibility of psychological science. *Perspectives on Psychological Science, 7*, 657–660. https://doi.org/10.1177/1745691612462588

Open Science Collaboration. (2015). Estimating the reproducibility of psychological science. *Science, 349*(6251), aac4716. https://doi.org/10.1126/science.aac4716

Pratt, M.G., & Bonaccio, S. (2016). Qualitative research in IO psychology: Maps, myths, and moving forward. *Industrial and Organizational Psychology, 9*(4), 693–715. https://doi.org/10.1017/iop.2016.92

Ritchie, J., Lewis, J., & Elam, G. (2009). Designing and selecting samples. In J. Ritchie & J. Lewis (Eds.), *Qualitative research practice: A guide for social science students and researchers* (pp. 1–23). London: Sage.

Salanova, M., Llorens, S., & Cifre, E. (2013). The dark side of technologies: Technostress among users of information and communication technologies. *International Journal of Psychology, 48*(3), 422–436. https://doi.org/10.1080/00207594.2012.680460

Schmidt, G.B., & Landers, R.N. (2013). Solving the replication problem in psychology requires much more than a website. *Industrial and Organizational Psychology, 6*(3), 305–309. https://doi.org/10.1111/iops.12056

Scholtz, S.E., De Klerk, W., & De Beer, L.T. (2020). The use of research methods in psychological research: A systematised review. *Frontiers in Research Metrics and Analytics, 5*, 1–17. https://doi.org/10.3389/frma.2020.00001

Schwab, K. (2016). *The fourth industrial revolution*. New York, NY: Crown Business.

Schreuder, D.M. (2001). The development of industrial psychology at South African universities: A historical overview and future perspective. *South African Journal of Industrial Psychology, 27*(4), 2–7. https://doi.org/10.4102/sajip.v27i4.792

Schreuder, D.M., & Coetzee, M. (2010). An overview of industrial and organisational psychology research in South Africa: A preliminary study. *South African Journal of Industrial Psychology, 36*(1), Art. #903, 1–11. https://doi.org/10.4102/sajip.v36i1.903

SCImago Journal & Country Rank. (2017). SJR- SCImago Journal & Country Rank. Retrieved from http://www.scimagojr.com/journalrank.php?category=3201&year=2015.

Scopus. (2017). *Document search*. Retrieved from https://www.scopus.com/home.uri.

Solis, L., Aristomene, T., Feitosa, J., & Smith, E. (2016). Taking qualitative methods a step further to team science. *Industrial and Organizational Psychology, 9*(4), 739–743. https://doi.org/10.1017/iop.2016.83

Spector, P.E. (2019). Do not cross me: Optimizing the use of cross-sectional designs. *Journal of Business and Psychology, 34*(2), 125–137. https://doi.org/10.1007/s10869-018-09613-8

Tiemann, H.A., Jr. (2019). Industrial and organizational psychology. In *Salem Press encyclopedia of health*. Salem Press. Retrieved from https://eds-a-ebscohost-com.nwulib.nwu.ac.za/eds/detail/detail?vid=3&sid=945b9073-566c-4b13-a462-a3d9958a82f0%40sdcv-sessmgr03&bdata=JnNpdGU9ZWRzLWxpdmU%3d#AN=93872044&db=ers

Van Kerkhoff, L. (2014). Developing integrative research for sustainability science through a complexity principles-based approach. *Sustainable Science, 9*, 115–120. https://doi.org/10.1007/s11625-013-0203-y

Weir, K. (2020, January). Elevating mental health on the world stage. *Monitor on psychology*. Retrieved from https://www.apa.org/monitor/2020/01/cover-trends-mental-health

Weiten, W. (2012). *Psychology themes and variations*. Belmont, CA: Wadsworth.

Wiggins, B.J., & Chrisopherson, C.D. (2019). The replication crisis in psychology: An overview for theoretical and philosophical psychology. *Journal of Theoretical and Philosophical Psychology, 39*(4), 202–217. https://doi.org/10.1037/teo0000137