A data generated framework for the use of research methods in psychological research: A multi-method exploration

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PREFACE

- Article format was followed to present this PhD thesis as indicated in the general A-rules of the North-West University.
- For ease of examination, the three articles are presented as a single document including (main article and references). Tables/figures, materials used (survey) are included in the articles or as appendixes as per author guidelines.
- Author guidelines are available in the Thesis Appendix 2.
- Page numbering throughout the thesis is consecutive.
- The American Psychology Association (APA) guidelines (6th ed.) was followed for referencing and formatting.
- The author guidelines for the identified journals for publication were followed for the three articles.
- An additional chapter discussing Amendments made to this PhD research study is also included.
- Co-authors of the three included articles gave consent for their submission for PhD degree examination.
- Turn-it-in was used to discern plagiarism and the report indicated 4%.
- Mrs Ina-Lize, who is a registered and accredited at SATI, PEG SAFREA and ZALang language practitioner conducted the language editing for this PhD research study.

SUMMARY

A data generated framework for the use of research methods in psychological research: A multi-method exploration

Keywords: Research methods, Research approach, Research trends, Psychological research.

Literature indicates a need for effective application of research methods by academia in the field of psychology, as lack thereof could influence future researchers, the quality and rigour of results, a country's contribution to the global knowledge economy, as well as knowledge generation in the field as a whole. One aspect that could promote this effective application of research methods is that of a clear and concise research framework to improve the quality of research. Therefore, the general aim of this research study was to formulate a research framework by investigating *what research methods are being used by researchers in the various fields of psychology, how they use these methods, and for which topics these methods are used*. These questions were explored and answered in the form of three articles (see Figure 1, Chapter 1 for a visual representation of objectives: Article 1-3).

The first article (Chapter 3) is a systematised review of five general psychology journals. These journals included publications from 2013 to 2017 and were chosen from the SCImago Country and Journal Rank miscellaneous psychology domain. Results (Tables 1-6 [Appendix 1], Figures 1-17 [Appendix 2], Chapter 3) of the 999 articles found were classified according to predetermined categories, namely: research topic, method, design, sampling, data collection and analysis. Ten themes were identified and categorised to form broad "research topics". A research topic refers to the research subject and starting point of a research project (Liu 2017). In accordance with Weiten (2010) the following research topics were found: social psychology, cognitive psychology, psychometrics, experimental psychology, physiological psychology, health psychology, developmental psychology, personality, education and learning psychology ~~as well as psychological practice~~. The authors

created the tenth theme, psychological practice, on the basis of the data. The identification of these research topics showed the topic most often researched during the selected five-year period. The results for article 1 were extensive, and are therefore broadly discussed in the article, accompanied by details on the methods used. These are tabulated and visually presented for each individual topic. The results provide insight into the use of research methods, especially with regard to trends in the application of certain methods such as quantitative methods or the mixing of research methods, without reporting the use of multi or mixed-method designs. This article also, unexpectedly, reveals a severe lack of rigour and transparency in certain aspects of the research process, such as the sampling method and design, for example. Convenience sampling was reported as the most common sampling method, and experimental designs were frequently reported, which concurs with the high number of quantitative studies. The categorisation of data collection showed the high occurrence and creative application of questionnaires and the high frequency of experimental tasks in the chosen sample. All methods of collection and analysis were listed regardless of their frequency, and this provided keen insight into how methods are being employed in practice. The results from this first article served as data for formulating the research framework in article 3.

Article 2, an amended chapter (Chapter 4), explores the use of research methods in the South African Journal of Psychology (SAJP). The same research questions identified for Article 1 were pursued in the South African (SA) context through a systematised review of 116 articles from the South African Journal of Psychology (SAJP) published between 2013 and 2017. This chapter of the study is an amendment to the original proposed research study, which is described in Chapter 2. The inclusion of an article focussing on the SA context provided the authors with the opportunity to compare the results of the two different contexts: international journals in Article 1 versus national journals in Article 2. The differences in

results between the international and national samples highlighted the need for and importance of separating the two samples into two different articles. This comparison also shows the uniqueness and possible role that context plays in shaping research as well as possible areas for development in SA research in comparison with international publications. Results from Article 2 (Tables 1-6, Figures 1-16, Chapter 4) show high frequencies for the use of mostly quantitative and qualitative research methods, with the increase in qualitative methods over the past years observable in previous research for the current sample (see Macleod & Howell, 2013). This high frequency of qualitative research contrasts with results from Article 1. The authors believe that this is due to specifics of the SA context. The application of these methods concurred with international results, in that a lack of rigour and transparency also existed in the SAJP publications in the reporting of samples and designs. Convenience sampling was the sampling method reported as most common, despite the high frequency of unspecified sampling methods. Cross-sectional designs were indicated as the most commonly occurring quantitative design, with narrative designs the most frequent qualitative design. Questionnaires were also found to be the data collection method of choice in this SAJP sample, followed closely by interviews. Descriptive statistics was the most popular among quantitative studies and thematic analysis was the method of choice for the qualitative studies. The same ten research topics were found in the SAJP as in the international sample. However, these topics occurred at different frequencies. Whereas the most popular research topic was still social psychology – showing the SAJP sample in line with global research trends – the second highest researched topic was psychological practice. This second topic, created from the data, showed a large amount of time spent on the development, experience, and practical considerations of psychology and research.

Articles 1 and 2 were not without limitations. *Firstly*, both articles were based on information stated in the sampled articles, and information could therefore have been lost (for

example the applied methodology). Future research should infer the methodologies applied to ensure that all methods are captured. However, by only using what was stated, the lack of rigour in articles was highlighted, which could influence trustworthiness as well as the development of research skills. *Secondly*, the use of the lesser known research design (systematised review design) could also have created room for error. However, as articles were merely categorised based on reported aspects, and the review followed a clearly defined reviewing process as well as Excel sheets and an online log for data collection, the authors believe this limitation to be small. *Thirdly*, conclusions for Article 2 were based on a single SA journal; future research should broaden the SA sample. Furthermore, the authors recommend that Articles 1 and 2 be used as a basis for further research regarding the reasons why certain aspects are not fully reported in publications and the possible impact this may have on the trustworthiness of results. Additionally, further research should also focus on why certain methods and their application are pursued above others, and the effect this has on answering research questions and developing research methodology.

In Article 3 (Chapter 5), a research framework was created according to the data from Article 1, which was evaluated based on feedback from a quantitative survey (Table 1, Chapter 5) completed by a set of eight research experts. The framework (named Method Garden) is available online (https://methodgarden.xtrapolate.io/) and results indicated that participants perceived the framework to be generally effective in improving knowledge and insight into research methods (Figures 3-17, Chapter 5). In other words, it successfully assisted researchers in the use of research methods. The use of the framework for student researchers enjoyed particular focus. However, participants did not feel inclined to use the research framework in their own research, and the reasons for this warrant further investigation. It was concluded that this preliminary framework served as a valuable first step to further development by employing the presented results and improving limitations.

Overall, it was concluded that the general aim of investigating the use of research methods in the field of psychological research was achieved through the insight gained into what research methods were being used, how these methods were being used, and for which topics. The following specific conclusions can be made: *firstly*, research methods and topics are influenced by context, and certain methods and research topics preferred above others indicate research trends. The low frequency of some other topics should be investigated further. *Secondly*, research methods are applied using interchangeable methodologies, and this may highlight a new era of method application and should be investigated further. *Thirdly*, a lack of rigorous reporting of methodologies exists in the chosen samples, which contributes knowledge to the replication crisis currently faced by the field of psychology. This lack of rigour was found in both Articles 1 and 2 and is visually presented in Article 3's research framework. *Fourthly*, the research framework was perceived as being potentially useful, by a small sample, in providing research knowledge and insight, especially as a tool for teaching student researchers. It is, however, recommended that article 3 should only be used as a preliminary framework and more data should be collected to refine and broaden the framework.

Lastly, from a thesis perspective, the amendments made due to nonresponse in article 2 were found to be favourable and pragmatic, as it contributed to the feasibility of the research study and provided in-depth insight into the SAJP. Furthermore, future students are encouraged to use the systematised review design in their studies and to attempt to replicate or expand the results of this study. The use of technology for their studies is also encouraged, as well as a pragmatic approach and constant evaluation of what is being done in order to determine if it would effectively reach the desired outcome.

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PERMISSION LETTER FROM PROMOTER

Permission is hereby granted for the submission by the PhD student, Salome Scholtz (a registered Research Psychologist at the Health Professions Council of South Africa [HPCSA]), of the following PhD thesis entitled: *A data generated framework for the use of research methods in psychological research: A multi-method exploration* for examination purposes, towards the obtainment of a PhD degree in Psychology at the North-West University.

The role of the promoter and co-promoter were as follow: Prof Werner de Klerk acted as promoter and project head of this research inquiry and assisted in the peer review of the PhD thesis. Prof Leon de Beer (co-promoter) assisted in the conceptualization of the PhD thesis as well as the peer review of the PhD thesis in totality.

Prof Werner de Klerk
Promoter

DECLARATION BY PHD CANDIDATE

I, Salomé Elizabeth Scholtz, student number 22308563, hereby declare that the thesis entitled: *A data generated framework for the use of research methods in psychological research: A multi-method exploration* is my own work and is herein with only submitted to the North-West University, Potchefstroom campus, in accordance to the requirements for the Philosophy Doctor in Psychology degree.

Salomé Elizabeth Scholtz

DECLARATION BY LANGUAGE EDITOR

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DECLARATION OF LANGUAGE EDITING

I, Ina-Lize Venter, hereby declare that I edited the research study entitled:

A data-generated research framework for the use of research methods in psychological research: A multi-method exploration

for **Salomè Scholtz**

for the purpose of submission as a postgraduate study. The author removed all references, tables and figures, and her final bibliography, before submitting the text for language editing. Changes to this text were indicated in track changes to be accepted or rejected at the discretion of the author.

Regards,

I Venter

Cum Laude Language Practitioners (CC)

South African Translators Institute accr nr: 1001925

CHAPTER 1 OVERVIEW OF THE RESEARCH

Contextualisation of Research Study

Psychology, as the study of the human mind and behaviour (American Psychological Association [APA], 2016), developed as the result of man's pursuit to better understand himself and has only been recognised as a scientific discipline since 1879 (Weiten, 2010). Today, psychology is considered the largest field of social science due to its popularity in the media and everyday lives of people (Aanstoos, 2014; Stangor, 2011). The field has also experienced momentous growth with regard to financial investment, practising professionals, and student numbers (Aanstoos, 2014). According to (Aanstoos (2014), these professionals can be divided into two categories of psychology, namely, applied or scientific psychology. Applied psychology refers to professionals who focus on treatment within psychotherapeutic contexts, whereas the scientific side of psychology refers to those professionals largely concerned with research and teaching in academic contexts (Aanstoos, 2014). This PhD research study is concerned with the latter category and aims to determine what research methods researchers in the field of psychological research use and how they employ these methods in attempt to develop a research framework to gain insight into research methodology and assist future researchers with the application of these methods. These results will allow the researcher (PhD student) to create a framework that will enable students and other researchers to more easily utilise these methods. Currently, all fields in Health Sciences are on a quest for science-based research to make effective clinical, research and health decisions (Perestelo-Pérez, 2013). It is, therefore, no surprise that research methods are an important aspect of training in psychology (Vorobyeva & Ermakov, 2015).

Concurrently, most qualified psychologists spend their time researching human behaviour in hospitals, laboratories, businesses and schools (Stangor, 2011). These psychologists include industrial/organisational (IO) psychologists, clinical or counselling

psychologists, educational psychologists, and research psychologists (Stangor, 2011). According to Hyland (2016), the world of research is dominated by eastern countries, especially Japan, and westernised countries such as the United States of America. The American Psychological Association (APA) identifies clinical, counselling and school psychology with subfields such as community, forensic, cognitive, developmental, engineering, health, industrial/organisational (IO), school, social, support, neuro, quantitative, rehabilitation, environmental and evolutionary psychology as registering titles in psychology (APA, 2016). In South Africa, the Health Professions Council of South Africa (HPCSA) recognises counselling, educational, clinical, industrial/organisational (IO) and research psychology (HPCSA, 2016). Stangor (2011) and the Department of Health (2011) maintain that, despite the differences between the various fields in psychology, they all have one aspect in common: the use of scientific methods to conduct research. A research method refers to a tool researchers use to collect data from various sources, such as individuals, groups, texts or artefacts, to understand aspects of a person's social reality (Nieuwenhuis, 2016a). Stangor (2011) expands on this concept and adds that research methods "provide a basis for collecting, analysing, and interpreting data within a common framework in which information can be shared" (p. 15).

Research Methods

Generally, researchers employ one of four research methods: mixed method, multi-method, and quantitative or qualitative research methods (Maree, 2016). Alternatively, researchers can also use reviews of literature to explore or examine certain topics (Grant & Booth, 2009). Within each of these methods, researchers can choose from various designs or approaches that inform their research process and data analysis. The mixed-method approach, a relatively new research method (Ivankova, Creswell, & Plano Clark, 2016), is employed by researchers to build on the strengths of both qualitative and quantitative research methods

(Johnson & Onwuegbuzie, 2004; Twinn, 2003). Onwuegbuzie and Leech (2005) describe mixed methods as synergistic, as they incorporate data collection and analyses from both qualitative (linguistic data) and quantitative (statistical data) methods (Sandelowski, 2011). Mixed-method research has three basic research designs: explanatory sequential design, exploratory sequential design and the convergent parallel design, in which quantitative and qualitative research methods are mixed in terms of data collection and analysis (Ivankova et al., 2016).

The terms mixed and multi-methods are often mistakenly used interchangeably in research (Esteves & Pastor, 2004). Multi-methods, like the mixed-methods approach, include both qualitative and quantitative research; however, each method in the multi-method approach is conducted independently throughout research until the interpretation of data (Morse, 2003; Niglas, 2004). Morse (2003) identifies sequential and simultaneous designs as the two main designs in multi-method research, each of which contains four combinations of qualitative and quantitative methods.

Although there are some research questions that can only effectively be addressed by using both qualitative and quantitative research methods, other studies or aims can be effectively answered by employing either qualitative or quantitative research methods (Demerath, 2006; Onwuegbuzie & Leech, 2005; Truscott et al., 2010). Quantitative researchers focus on collecting numeric or quantified data to provide statistical evidence (White & Millar, 2014) to determine the relationship between variables for testing objective theories (Moxham, 2012; Polit & Hungler, 2013). Three quantitative designs are employed for examining these variable relationships, namely; experimental, quasi-experimental and non-experimental designs (Gravetter & Forzano, 2009).

In contrast to quantitative research methods, qualitative methods aim to provide researchers with an understanding of humans in various conditions or contexts (Bengtsson,

2016) by using linguistic data and meaning-based analysis (Nieuwenhuis, 2016b). Literature indicates seven main qualitative research designs: narrative, phenomenological, grounded theory, case studies, ethnographical (Creswell, 2007), interpretive descriptive (Sandelowski, 2000), historical and participatory action research (Mulligan, Wilkinson, Lusty, Delorme, & Bong, 2015).

Lastly, researchers also employ the use of literature reviews to address certain topics. Reviewing literature is defined as inspecting or examining an aspect again while using methods with subtle variations in rigour and degree in process that is indicative of the various subtypes of reviews (Grant & Booth, 2009). Grant and Booth (2009) distinguish between fourteen different types of reviews, namely: systematic, systematised, rapid, critical, systematic search and review, literature, meta-analysis, systematic map, mixed method, qualitative systematic, overview, scoping, state-of the art, and umbrella reviews.

Despite the depiction of methods as structured constructs with fixed boundaries, it is important to note that these boundaries are constantly crossed in research practice (Johnson, Long, & White, 2001; Sandelowski, 2010). Sandelowski, Voils and Knafl (2009) highlight this fact by referring to the boundaries crossed when qualitative methods combine with quantitative methods (for example ethnography). This crossing of boundaries also threatens the existence of mixed methods designs, as these designs rest firmly on the notion of two distinct qualitative and quantitative processes (Sandelowski, 2011). Other studies (see Niglas, 2004), exemplify these debates by identifying articles that confirm the use of mixed method designs as research method, but include methods with minimal integration of qualitative and quantitative research (Truscott et al., 2009) which is more characteristic of multi-method research designs.

The use of mixed-method designs has grown over the past decade (Creswell, Plano Clark, Gutmann, & Hanson, 2003; Descombe, 2008; McMillan & Schumacher, 2010), and

can be seen in various studies addressing research problems and phenomena with a growing body of methodological and theoretical frameworks (Cameron, Sankaran, & Scales, 2015). This growth is indicated by the use of mixed method designs in research texts, by funding bodies and in journals – especially journals that focus on mixed methods (Cameron et al., 2015). Cameron et al. (2015) list medicine, health, education, behavioural and social science research as areas in which the method has gained acceptance. Concurrently, mixed method designs are becoming a preferred method in the social sciences (Symonds & Gorard, 2010). According to Breen and Darlaston-Jones (2010), psychological research is, however, dominated by the use of quantitative research methods, as can be seen in journal publications, research training and funding (Bhati, Hoyt, & Huffman, 2013; Walsh-Bowers, 2002). This might be due to the genesis of psychological research in scientific/positivistic methods (Aanstoos, 2014) – with minimal techniques like qualitative methods used before 1980 (Gough & Lyons, 2016]); researchers experiencing challenges in employing mixed methods designs (Schulze & Kamper, 2012); or consciousness of prejudice against qualitative researchers, academic staff and students in the field of academia (Roberts & Povee, 2014). However, Karasz and Singelis (2009) as well as Rennie, Watson and Monteiro (2002) argue that the use of qualitative research methods in the field of psychology is increasing, as is evident from the popularity of journals such as the Journal of Phenomenological Psychology, Qualitative Research in Psychology and special issues for qualitative research methods in mainstream psychology. Mcilveen (2008) adds that, however limited, qualitative data and methods have gained legitimate space in psychology research. He supports this argument by referring to prestigious journals such as The Counselling Psychologist, Journal of Counselling Psychology and the Journal of Career Assessment (McIlveen, 2008). Demuth (2015) does not only support the notion that qualitative research has gained space in psychological research, but describes the method as “flourishing” (p. 125) with various

publications in journals, text books and even encyclopaedia entries. This growth in qualitative research is also evident in the United Kingdom due to a decline in quantitative research as a component of training, and academic publication (see British Academy, 2012; MacInnes, 2009; McVie, Coxon, Hawkins, Palmer, & Rice, 2008; Parker, Dobson, Scott, Wyman, & Landén, 2008), already indicating a shift in previous perceptions of research trends.

Choice of Method

A researcher's choice of method can be determined by various aspects. O'Neil and Koekemoer (2016) as well as Chilisa and Kawulich (2012) support a researcher's paradigm as one of these aspects, as it influences the beliefs and assumptions of a researcher regarding the research problem, the process of investigation and the choice of method. According to Patton (1978), a paradigm is a world view that shapes our perspective on world complexities. Three paradigms that are generally identified in research literature are post-positivism, critical theory and interpretivism (Cupchik, 2001; Nieuwenhuis, 2016b). Quantitative research is more commonly associated with positivistic or post-positivist paradigms (Bishop, 2015; Chilisa & Kawulich, 2012; Roberts & Povee, 2014), in contrast to critical theory, which postulates an inter-link between the researcher and participant (Doucet, Letourneau, & Stoppard, 2010) such as interpretivist paradigms that are both more generally associated with qualitative research (Bishop, 2015; Chilisa & Kawulich, 2012; Roberts & Povee, 2014). With regard to mixed method designs, Patton (2014) identifies the use of pragmatism for a philosophy on reality. Pragmatism focuses less on the methods used in research and more on gaining answers to the research question (Patton, 2014), thereby allowing the researcher to choose the most suitable strategy for addressing a research question and its contextual interpretations (Ivankova et al., 2016). Multi-method designs, on the other hand, consist of both qualitative and quantitative research methods separately (Brewer & Hunter, 2006).

Independent paradigms can therefore be followed in this design for both qualitative and quantitative methods.

As the research question is grounded in the researcher's paradigmatic views, Grix (2002) argues that the research question should determine the research method. The choice of research method is thus not based solely on the researcher's paradigmatic views, but interconnected with the research question (Grix, 2002). A researcher's chosen method therefore indirectly presents his or her view on reality and thus their paradigmatic position (Nieuwenhuis, 2016b). Jansen (2016) and Gravetter and Forzano (2009) also support the importance of the research question. Concurrently, Chilisa and Kawulich (2012) expand on the importance of the research question or topic in determining the research method, by stating that, as there is no universally set framework for the ties between method and paradigm, researchers should choose whichever paradigm or method is suitable for their topic considering that coherence between paradigm and method will influence research quality (Creswell, Hanson, Plano Clark, & Morales, 2007).

However, it is also important to consider reasons other than the "research question" that could influence a researcher's choice of method for their study, such as perceptions regarding a specific method (Truscott et al., 2010) and abilities and training in the use of different research methods (Nind, Kilburn, & Wiles, 2015; Roberts & Povee, 2014; Walsh- Bowers, 2002).

Problem Statement

Sustaining and building methodological capacity is becoming more and more imperative as research consumers (universities, funders and the public) are demanding challenging research from unfamiliar empirical terrains (Nind, Kilburn, & Luff, 2015). This is especially true in Africa, as the continent's "future rests with the development of its intellectual and human capital through strong capacity-building programmes and systems in

higher education and the development of locally relevant and applicable research and innovation structures" (Frantz et al., 2014 p. 1226). According to Walton and Dweck (2009), some issues faced by the public – such as social issues – are actually psychological issues, or have psychological components.

Addressing social issues through psychological research has become more common in recent years (Dweck, 2017). Hence, psychological researchers are focusing their research prowess on topics that influence social concerns, which has earned psychological researchers the opportunity to advise world leaders, influence decision-making and contribute to health ministries and education (Dweck, 2017). Despite these demands, Nind, Kilburn and Luff (2015) argue that research skills in the social sciences are still lacking. The ability to apply research skills is especially imperative in psychological research and academic lecturing, as the field demands knowledge and skills to scientifically hypothesise, test, analyse and provide insight into aspects of human behaviour (The British Psychological Society, n.d). The lack of adequate research capacity in the field of academia are illustrated in the following three examples: firstly, Scott Jones and Goldring (2015) found that lecturers in academia require support and resources to upskill their lecturing of research methods. Earley (2014) further supports the occurrence of this need, as well as investigation into academia's use of research methods, by stating that academia must rely on advice from peers, trial and error, and "scattered research literature" (p. 243) when teaching research methodology. Academic research supervisors also assist students with their own studies by guiding them through the research process (Strnadova, Cumming, Knox, & Parmenter, 2014), thereby influencing future academic researcher skills and attitudes (Scott Jones & Goldring, 2015). Clarity in terms of research methods plays a role in various aspects of a researcher's career (see Davis, Evans, & Hickey, 2006; Hyland, 2016; Tan, 2007; Waite & Davis, 2006), is beneficial for

institutions (Hyland, 2016) and advances the promotion of theory development within a discipline (Ngulube, 2013).

This lack of clarity and scattered information regarding research methodology is also highlighted by Levitt, Motulsky, Wetz, Morrow and Ponterotto (2017) in the second example; reviewers in the field of psychology are often ill-equipped to review certain research methods. Reviewers are unable to effectively review research methods because the only possess topical knowledge of methods, are only aware of specific designs for methods, or are confused by unfamiliar method application. This lack of insight into research methodology may further lead to the rejection of strong studies or the acceptance of well-applied, familiar approaches that do nothing to broaden knowledge in the field (Levitt et al., 2017). Furthermore, reviewers could also find themselves in a situation where they agree to review a study, only to discover that it features a method they are not fluent in. This often results in an attempt to review the study despite the lack of insight into the research method (Levitt et al., 2017). To compensate for reviewers' (often academics) lack of knowledge, the field has attempted to establish a set of procedural rules and checklists to enhance research rigour. However, this method may lead to conflicting reviews and limit appropriate adaptation of designs and the development of new methods (Levitt et al., 2017).

Concurrently, the third example indicates that the need for effective research knowledge and application is not only evident on the part of the reviewers but also in the publications and results themselves. This can be seen in Africa's low publication rate, for which Ezeh et al. (2010) attributes to insufficient knowledge of sound methodological application. Frantz et al. (2014) also identify limited research capacity, which includes poor research and publication skills as well as low research culture, as a factor limiting Africa from engaging in effective research and higher outputs. In 2010, the impact factors of South African social science journals were rated in the fourth quartile of the Thomson Reuters'

Journal Citation Reports®, an effective bibliometric evaluator (Bornmann, Neuhaus, & Daniel, 2011). The country is also rated 139th on the SCImago Journal and Country Ranking (SCImago, Journal & Country, 2018). The low impact factors of South African journals discourage researchers to submit quality articles and fail to attract international researchers. This, in turn, may lower the standards of these journals even further and stop publication altogether (Pouris & Pouris, 2015). The ability to publish articles in South Africa also plays a role in universities as they receive government subsidy for published articles (Pouris & Pouris, 2015). Thus, low research efficacy influences the quality of research results and hinders a country's contribution to the global knowledge economy (Hyland, 2016), as research results can only be confidently accepted in the field of academics if sound research methodological practices have been applied (Ketchen, Boyd, & Bergh, 2008).

It is thus imperative for researchers to receive support in research methodology to provide quality research (Walliman, 2011). Di Nuovo (2014) reiterates this point by adding that, if young researchers or those from specific countries submit for publication articles that display the use of appropriate methodology, there are no reasons for the research not to be accepted as scientifically valid.

Therefore, this PhD research study aimed to provide research support to current researchers in the field of psychology by developing a clear and concise, data-generated research framework. Such a framework is important, as a poorly applied research methodology could significantly affect future researchers, the growth and validity of psychological knowledge and publications, as well as academics' careers and contributions to the global knowledge economy. This framework will be applicable, as Sandelowski (2011) concludes that, despite the blurring of boundaries in the application of research methods in practice, the categorisation and classification of these methods is still imperative for educating people in the use of research methods. Levitt et al. (2017) concur with this

statement by identifying “procedurally driven descriptions of methods” as “helpful primers when first learning a particular approach” in psychological research (p. 6). Di Nuovo (2014) adds that theoretical and experimental research in the field of psychology should be diffused and realised in globally shared methodology. This corresponds with various causes literature identifies for lack of research skills, for instance, too many variations and inconsistencies of the methods in literature (Creswell & Garett, 2008); confusion of the unified picture of research and the study domain (Murtonen, 2007); and misunderstandings of alternative theories, methods and frameworks applied in unfamiliar combinations (Truscott et al., 2010). Additionally, Kraiger, Ford and Salas (1993) state that knowledge of research skills is essential for effective application. There are two types of knowledge for a specific domain: declarative (Abu-Zaid & Khan, 2013) and procedural knowledge (Davis & Yi, 2004; Gagne, 1984). Balloo, Pauli and Worrell (2016) provide the following examples of these two types of knowledge in psychology research: declarative knowledge of research methods, which refers to a researcher’s ability to know which methods to apply in various situations; procedural knowledge refers to a researcher’s ability to apply that method within the specific context. Thus, a researcher should possess enough knowledge on research methodology to discern the most effective method to employ and how to employ that specific method. The core questions of this PhD research study were: *What research methods are being used by researchers in the field of psychological research? Why do they employ these methods?* And *How do they employ these methods?*

National and international journal articles in the field of psychological research were consulted (in accordance with Di Nuovo, 2014). According to Nihalani and Mayrath (2008), scholarly journals aim to promote scientific understanding and serve as dissemination outlet for scientific endeavours. Such an analysis of articles published in academic journals could assists researchers and science educators in exploring current and future research trends (Tsai

& Wen, 2005). According to Hicks and Katz, (1996), future knowledge will be produced by more people in more locations. Sooryamoorthy (2013) adds that more scientific research is conducted collaboratively by different institutions and individuals globally. Sooryamoorthy (2013) further maintains that this collaboration in research is the basic fabric of science. Di Nuovo (2014) also supports the use of resources from various countries by stating that, despite the popularity and differences in application of certain psychological research methods in each country, global methodological guidelines should still be established and followed.

In general, the aim of this PhD research study is to contribute to the pursuit of promoting research capacity and the role of methods training, which is a growing field and therefore forms part of emerging arguments on building social research workforce capacity to undertake sophisticated research tasks (Nind et al., 2015). Van Rossenberg (2017) also states that journals should be encouraged to publish articles such as those included in this PhD research study, as the growth in research methodologies would certainly benefit from an outline of these methods, especially those in certain fields of psychology. The focus on research methods in publications will also attempt to steer away from Levitt et al. (2017)'s concern over Bakan's (1967) concept of "methodolotry", which implies the use of predetermined, fixed methods for research, instead of using the research method best able to address their research question. This PhD research study hopes to contribute to the specific discipline of research psychology by providing a report on the research methods employed in practice by research experts and the reasons why (by means of the research topics); this may also provide opportunities for further research. This PhD research study also organised the information in a data generated research framework to be used as a tool for the promotion of efficient method application and possibly assist in reviews (Levitt et al., 2017), as well as improve research outputs and publications (Ketchen, Boyd, & Bergh, 2008). Having clear

and concise access to research methods, by means of categorized list of articles and the research framework, may also decrease method bias and improve self-efficacy in using methods, an aspect Van Rossenberg (2017) found particularly true for industrial and organisational psychology, as researchers tend to only use a limited number of research methods. This often leads to the methodology guiding the research thinking (i.e. researchers choose research questions that will fit the research method), research training in only some of the methods, and stigmatisation of other methods which, as a result, are not published.

If seen as a product, one might imagine the presented research framework as an interactive framework, that will work in the following manner: The researcher chooses their research topic, and the data gathered in this PhD research study directs the researcher to the research method/s associated with the chosen topic. Therefore, this PhD research study did not aim to eliminate the need for improved research skills, but to provide a first step to assist researchers in conducting psychology research by broadening exposure and access to research methods as well as provide insight into research trends. This PhD research study also addressed the gap of one-sided studies that mainly focus on students' use of research methods or studies that explore the use of only one method or the use of a method in one field of psychological research. From a personal perspective, conducting research on research methodology by applying various research methods addressed an aspect Van Rossenberg (2017) identifies as one of the root causes of biased use of research methods: PhD students who only use one method of inquiry during their studies. Applying more than one method to investigate research methods in psychological research would certainly enable a researcher, "to consider a diversity of methodologies at a later stage" (Van Rossenberg, 2017).

Lastly, in line with a similar study by O'Neil and Koekemoer (2016), this PhD research study also provided an opportunity to appreciate the scope of possibilities the selected research methods offer to the field of psychological research. This may identify gaps

for new methodologies and encourage the interrogation of new perspectives on certain topics through the application of creative research methods.

Aim of Research Study

The aim of this PhD research study was to determine which research methods researchers in different fields of psychology use, why they use these methods, and how they employ these methods. The use of research methods was thus investigated in the broad field of psychology and not in specific disciplines, such as industrial psychology, for example. This knowledge was then formulated into a comprehensive research framework to assist future researchers with employing research methods in the various fields of psychological research (see Figure 1 for a visual representation of research objectives). Thus, the general aim was to explore the use of research methods by means of a usable framework; not to critique or evaluate researchers' use thereof against any predetermined criteria. This aim attempted to improve our knowledge of and insight into the reality of how research methods are employed in practice and to use this knowledge to improve our future use of these methods. The development of this framework not only aimed to address a need for improved research skills, but it also falls within the scope of practice for research psychologists (Department of Health, 2011). The specific objectives were to:

1) *Critically review international and national articles from the field of psychological research to determine what research methods are being used, how these methods are being used, and for what topics (Article 1).*
2) *Critically review articles from the South African Journal of Psychology (SAJP) to determine what research methods are being used, how these methods are being used, and for what topics (Article 2).*

3) *Formulate a research framework based on data from objective 1 on how to choose a research method and what process to follow in conducting that method (Article 3).*

Pragmatism as Philosophical Underpinning

Transparency with regard to research paradigms or philosophical ideas allow clarity for the philosophical justification of choosing the applied research methodology which may increase a study's rigour (Wilson & Stutchbury, 2009). When considering a paradigm, attention should be paid to the epistemological perspectives of the link between methods and paradigms (Guba & Lincoln, 1994), which is typical practice in South African psychology (Barnes, 2012). The belief system in which research was performed and interpreted for this PhD research study was *pragmatism*. The following were specifically considered with regard to pragmatism: ontology (nature of the social world), epistemology (relationship between social world and enquirer) and methodology (best way to gain information) (Guba & Lincoln, 1994). According to Barnes (2012), the ontological perspective of pragmatism accepts that reality is both objective and formed by people's perceptions; both can be investigated and allow for deeper understanding. Additionally, the epistemological view of pragmatists is that of 'intersubjectivity', in that researchers fall somewhere between subjectivity and objectivity in their research (Barnes, 2012). Lastly, these views of ontology and epistemology lead to the view that methods could be used together, especially if the complementary use thereof would provide the best outcomes.

The concept of truth through the lens of pragmatism is shaped by experience (Smith, 2019) and the focus is placed on the outcome and purpose of generated knowledge (Cornish & Gillespie, 2009). Knowledge is therefore seen as a tool for a specific purpose or "consequence in action" (Cornish & Gillespie, 2009, p. 802). The quality of this knowledge

is finally judged by its effectiveness in addressing everyday problems (Cornish & Gillespie, 2009).

Pragmatism influenced the research questions asked and answered (Brierley, 2017) by focussing on the applied processes and applying what would work best to help the researcher reach the desired outcomes (Ozmon & Craver, 2008). In other words, the research questions were addressed on the basis of "what works" (Johnson & Onwuegbuzie, 2004; Onwuegbuzie & Johnson, 2006). This belief system of considering the practicality and possible outcomes of an approach allowed the researcher to choose the systematised review design as a research method (Article 1 & 2) and to make amendments to the PhD research study (see Chapter 2). The systematised review allowed the categorisation of the data with minimal systematic processes concurring with the aim of the studies. With regard to the amendment in Chapter 2, the authors believed that there was a way to better utilise the data and avoid further, possibly fruitless action that may not have contributed usable data to the broader outcome of this PhD research study in the specific context.

Like constructivism, pragmatism can also be seen as pluralistic, with various forms of knowledge and interests being accepted (Cornish & Gillespie, 2009). This paradigm encourages communication from researchers on different views and methods for conducting research and joint action because of these differences (Morgan, 2007) as a way to develop shared understanding (Brierley, 2017). This view was especially applicable to this study, as pragmatism rejects the notion of a 'hierarchy of evidence'. A hierarchy of evidence considers certain research methods as better than others, while pragmatism sees each method as suitable for achieving particular outcomes (Baert, 2003, Camic, Rhodes, & Yardley, 2003). This promoted an unbiased stance in collecting and synthesising data on research methodology for the articles presented, for methods were seen as tools and the application of these tools remained in the context of the aims of the articles. Concurrently, the researcher

continuously focussed on categorisation, and not on critiquing the application of research methods.

Other defining aspects of pragmatism that can be seen in this PhD research study is that pragmatism promotes research questions that are followed by research methods and not methods that dictate the research questions (Creswell & Plano Clark, 2011; Teddlie & Tashakkori, 2006), thereby allowing the chosen methods to be applied in this study. Pragmatism also concerns itself with concrete human activity, rather than intellectual arguments (Cornish & Gillespie, 2009), which is why the researcher used real published articles instead of theoretical discussions or inputs from researchers as participants, to highlight the reality of how psychological research is applied in practice. Lastly, pragmatism also emphasises creating and evaluating interventions (Cornish & Gillespie, 2009), allowing for the creation and evaluation of the effectiveness of the research framework in addressing a problem (research gap and use of research methods).

Methodology

The overarching method for this PhD research study was a multi-method approach (see Figure 1), while different methods of data collection were employed and each followed their own paradigm (Morse, 2003). Three related, but independent, articles were used to present the data of this PhD research study: each addressed one of the objectives. Each article consists of an introduction, method, results summary, conclusions and recommendations section. The results from the review in Article 1 is complemented by the framework and a quantitative survey in Article 3. Article 1 also provides a valuable basis for comparison with Article 2. Accordingly, the methodological construction of the three articles are as follows:

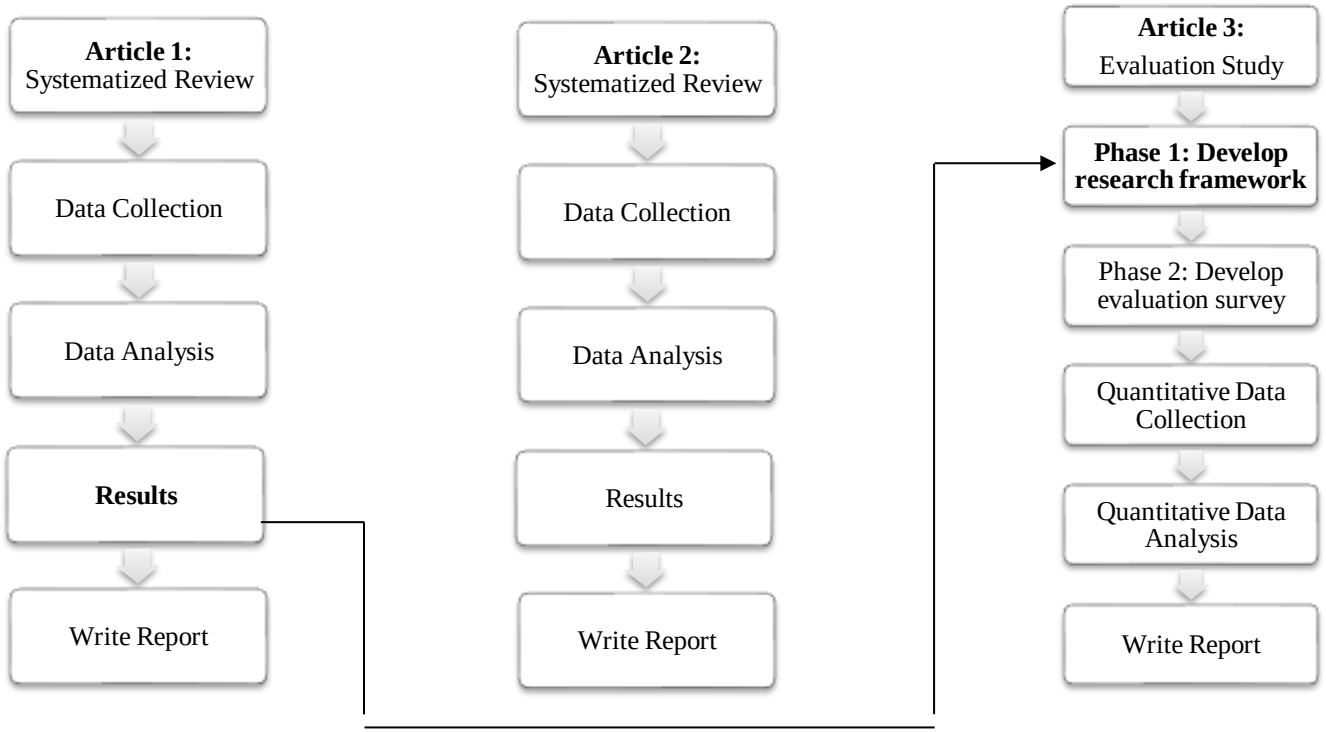
Article 1: Used a systematised review.

Article 2: Was an amended chapter, and followed the same methodology identified for Article 1 in a different context.

Article 3: The final article of this PhD thesis consists of two phases. Phase 1 aimed to develop a research framework based on data from Article 1. Phase 2 aimed to evaluate the research framework created by means of an online quantitative survey completed by research experts and analysed using SPSS.

Figure 1

Visual Representation of Objectives: Article 1-3



Ethical Considerations

All ethical guidelines as indicated by the Health Professions Council of South Africa (HPCSA, Act56 of 1974) and the North-West University were followed throughout this PhD research study. Specifically, this PhD research study was evaluated and approved by the Health Research Ethics Committee (HREC) of the North-West University.

Risks and Dangers

The risks and dangers associated with the review studies (Articles 1 and 2) were minimal, as data was available freely on the journal websites. Article 3 included survey research which entailed a significant possibility of non-response. However, this aspect was addressed by avoiding sensitive topics, keeping the survey short and conducting the research study through a reputable institution, namely the North-West University.

Further risks associated with the participants were identified as follows: no risks for Articles 1 and 2, as no participants took part in these; a low risk for Article 3, as the survey was conducted with a non-vulnerable group (adults), and included no sensitive topics. Thus, the researcher predicted that participants would experience no more than minimal discomfort, if any, as encountered in daily life whilst taking part in this PhD research study. There was no risk of physical harm in this research, as no part of this investigation was concerned with the body of the participants. The only foreseeable costs identified for participants was that of internet usage.

There were no direct benefits identified for participants of this research study; however, participants may have experienced some unintended benefits in the form of self-discovery and closure by reflecting on their past research experiences. Their participation also provided them with the option of receiving feedback (see dissemination of results) on the results of this research study (Article 3), thereby possibly giving them an opportunity to improve their self-knowledge – especially in the context of the professional and educational

settings. Future possibilities and the potential of the results – improved frameworks of teaching and using research methods for students and researchers – shifted the risk/benefit scale in favour of benefit. Due to budget constraints, participants did not receive any remuneration for partaking in this study.

Dissemination of Results

After a report had been written based on the analysed data, participants received feedback on the results via a post of the Article 3 report on the PhD student's ResearchGate profile. Results would also become available when the written articles were published in the identified accredited journals, if accepted, and the PhD thesis will be available in the North-West University Main Campus Library.

Process of Sample Recruitment and Informed Consent

Cook (2015) identifies obtaining informed consent as the corner stone of ethical research. Written informed consent for this research study (Article 3) was obtained from participants by an independent person. The independent person was trained in research psychology (registered at the HPCSA as an intern or research psychologist) and conducted the consent via email. After possible participants had been identified by the researcher, the independent person contacted these persons through ResearchGate by sending them an invitation to take part in the research study. A link to the informed consent was included with the invitation. Willing participants who clicked on the link were directed to the informed consent form where an "agree" button was presented at the end of the form. After clicking on "agree", the link directed them to the online survey. The researcher ensured that the participants had provided informed consent and took part in the research voluntarily throughout the process.

Respect for Persons

The researcher respected and strived to protect the human rights of her participants (Article 3) throughout this research process. She also strived to treat all participants equally and in a professional manner. The researcher upheld an air of honesty and openness toward participants regarding any information involving the research. Being forthcoming about the research study goals (aim, objectives) and data analysis is one such an example. Additionally, the researcher also upheld the identified aspects of privacy and confidentiality as discussed below in accordance with HREC.

Relevance and Value

Article 1 and 2: This systematised review studies contributed to our understanding of what research methods are generally employed and published as well as how these methods are used in an attempt to improve our knowledge regarding method use in psychological research. Article 2 contributed specifically to research in the South African context and also provided in-depth insights for the country that provided the resources for this research study.

Article 3: The use of the systematised review in Article 1 provided enough data to create a data-generated framework for choosing and employing research methods in the identified fields of psychological research, along with expert tips when conducting these methods.

The results from the overall research study could therefore possibly promote student researchers' use and understanding of research methods which – as stated in literature – may pose various benefits, including stronger professional prospects and higher article publications, an aspect that could be of great value in the South African context.

Scientific Integrity

The identified research method and design were followed for Articles 1, 2 and 3 throughout the research process. The scientific integrity of Articles 1 and 2 was ensured by

the student's constant reporting (every two weeks) on the progress of the systematised reviews to her promoters, to ensure that the student was adhering to the process identified. The identified aspect of face validity was used to ensure the scientific integrity of Article 3. The researcher was a PhD student at the time this research study was conducted, and – as such – her promoter (a registered research psychologist) and co-promoter (a registered industrial psychologist and research psychologist) supervised the research process and were involved in the data analysis of results to ensure its accuracy.

Distributive Justice

The sample of articles for Article 1 and 2 were chosen by means of a non-probability purposive sample. The specific inclusion criteria for Psychology journals in Article 1 was specified as the top five ranked English journals of the SCImago Journal & Country Rank, under the miscellaneous psychology domain. Journals were also excluded if no full text version of their articles were available; if journals only published articles using a specific research method; or if the journal only published research in a certain domain of psychology (for example, industrial psychology, clinical psychology etc.). Article 2 only included one South African journal (as this research study was conducted using South African resources) presented on the SCImago Journal & Country Rank concerned with broad psychological research regardless of its' ranking, namely the South African Journal of Psychology (SCImago Journal & Country Ranking, 2018).

Article 3 was based on data from a small sample of key informants chosen through purposive sampling. Thus, to form part of this study, participants had to hold an academic position, had to have conducted research within the field of psychological research, and have internet access. In addition to the identified criteria, the sampling process selected participants in alphabetical order by surname until the desired sample size had been achieved.

Professional Competence

The researcher conducted herself in a professional manner at all times as is required of her by the HPCSA. Her education includes a bachelor's degree in Psychology and Labour Relations, an honours degree in Psychology, and a master's degree in Research Psychology – all from the North-West University (Potchefstroom campus). Additionally, the researcher had also completed her research psychology internship at the North-West University's School of Psychosocial Behavioural Sciences in 2016 and, as such, had attended the required ethics workshop (18-20 January 2016) presented by the North-West University's HREC. She had also passed her HPCSA exam in 2018 to register as a research psychologist. The researcher worked under the supervision of her promotors, who were available for consultations during the research process: Prof W de Klerk is a registered research psychologist with a PhD in psychology, and Prof LT de Beer is a registered industrial and research psychologist with a PhD in industrial psychology and therefore bound to ethical rules and guidelines under the HPCSA. Additionally, the project accuracy, precision and adherence to ethical rules and professionalism was monitored by the project head (Prof W de Klerk).

Furthermore, the three researchers (PhD student and promoters) were competent in collecting data for –

Article 1 and 2: both promoters have conducted reviews and done analyses by means of coding in their professional careers. Grant and Bootht (2009) identify systematised reviews as the review of choice for postgraduates, as it only uses certain aspects of a systematic review; the PhD student had also had extensive training and experience in the analysis of data by means of theme analysis.

Article 3: both promoters have training and experience, and have published research based on the data of quantitative research designs. Additionally, the co-promoter is viewed as an expert in quantitative data analysis (Mplus & SPSS). The PhD student also contributed

experience and education in research methodology in general, with expertise in research methodology and a short course in quantitative data analysis.

Privacy and Confidentiality

Participants (Article 3) were informed of the extent to which study data would be kept private and confidential, and who would have access to the data collected (the PhD student and promoters) and what the results would be used for. This serves to assure participants that their privacy will be respected throughout the study. For Article 3, *confidentiality* of participant information was ensured by automatically assigning participant numbers to those who had provided informed consent at myresearchsurvey.com. Any copies of the written quantitative questionnaire were kept on the password-protected computers of the researchers. All other identifying information of participants were kept in safe storage (hard copies locked in filing cabinets in the offices of the researchers, which only the researchers had access to).

After completion of this PhD research study, all data collected for this research will be kept at COMPRES at the North-West University in Potchefstroom for seven years, after which it will be destroyed by the North-West University. The HREC of the North-West University monitored this research to ensure that all aspects agreed to upon approval were adhered to. Furthermore, myresearchsurvey.com provided SSL encryption, protection and validation by Norton and TRUSTe as well as HIPAA-compliant features to ensure privacy, security and anonymity of data collected through the online questionnaire included in this PhD research study (Article 3).

Publication of Results

After a report (PhD thesis) had been written on the data analysed, participants received feedback on the results via email. Results will also be available if the written articles are accepted for publication in the selected research journals.

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CHAPTER 2 STUDY AMENDMENTS

Amendments were made to Articles 1, 2 and 3 of this PhD research study, which were due to changes to the title and aim of Article 2. This section provides a short description of these changes.

Original PhD Study

The PhD research study originally proposed aimed to explore the use of research methods by designing a research framework (Article 3) based on data from the following questions: *What research methods are being used by researchers in the field of psychological research? Why do they employ these methods? How do they employ these methods?* (Article 1 & 2). These questions were to be addressed in three aims:

1) Critically review international and national articles from the field of psychological research to determine what research methods are being used, how these methods are being used, and for what topics (Article 1).
2) *Determine what the processes as well as personal and contextual aspects are that inform academic researchers from the field of psychology in conducting research (Article 2).*
3) Formulate a research framework based on data from objectives 1 and 2 on how to choose a research method and what process to follow in conducting that method (Article 3)

Reason for Amendments

Upon completion of aim 1 (Article 1) in June 2019, 1115 articles were analysed from five top ranked international journals as well as the South African Journal of Psychology (SAJP), as per the approved proposal. The first phase of sampling for Article 2, entitled "*Factors in formulating psychological research processes: A Mixed*

Method study", was conducted three times in an attempt to reach the proposed 50 participants. Responses from the sample of academia resulted in only 5 participants, of which only 2 submitted completed questionnaires. The aim of the data was to answer the above research questions, and the sample was too small to provide a valuable contribution to the research study. Additionally, due to the vast amount of data collected in Article 1, the authors did not believe that the sample collected for Article 2 would provide a contribution to the research framework (Article 3). The inclusion of a journal (SAJP) listed below the top five journals also created the possibility for skewed results.

Amendments Made

Based on the reasons mentioned above, the authors suggested that the original research aim of Article 2 change to the following: *Critically review articles from the South African Journal of Psychology to determine what research methods are being used, how these methods are being used and for what topics (Article 2).* This change resulted in separating the data for the South African Journal of Psychology (SAJP) from the sample in Article 1 for use in Article 2. The same methodology used in Article 1 was also applied in Article 2. Additionally, only the remaining data from Article 1 was used to create the research framework in Article 3.

Ethical and Scientific Implications of Amendments

The application for amendment was approved by the ethics committee (HREC) as well as the scientific committee (COMPRES) of the North-West University (Thesis Appendix 1).

From an ethical standpoint, this change limited human participants to Article 3 only, thereby eliminating all human ethical concerns for Article 2. With regard to scientific implications, the authors experienced four benefits to this change. *Firstly*, the separation of the SAJP data from Article 1 allowed the results to be shown to their best

advantage instead of being swallowed up by the other five journals. This is evident when comparing the results of Article 1 and 2. *Secondly*, this separation also prevented the SAJP data from skewing the results from the top ranked international journals, as the SAJP was ranked far below these publications (139th on the Scimago journal & Country Ranking System [Scimago journal & Country Ranking System, 2017]). Thirdly, the contributions of the amended Article 2 provided the opportunity to fully utilise data for the South African context in particular. The authors were also able to compare results from the top ranked journals with the SAJP to highlight research gaps and provide insight into "hot topics" for South African research. Lastly, from a practical perspective, separating the data collected in Article 1 allowed for more room to discuss and elaborate on results in both Articles 1 and 2.

The only aspect lost after the amendments was that the SAJP no longer contributed to the formulation of the research framework in Article 3. However, due to the large number of benefits gained from the amendments, the authors believed this to be a favourable cost benefit.

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CHAPTER 3 THE USE OF RESEARCH METHODS IN PSYCHOLOGICAL RESEARCH: A SYSTEMATISED REVIEW (ARTICLE 1)

Article journal format: This article has been submitted and is being reviewed by *Frontiers in Psychology* (impact factor 2.129, wordcount: 12000 (reviews), references according to APA 6th edition). The article is presented in the format of the Word template provided by the journal. Line numbers were used for submission of the article but not in this thesis for a uniform thesis. Aspects such as author contribution, funding etc. were stated in the online submission platform of Frontiers in Psychology and therefore not included in the main text of this article. Author guidelines for table and figure labels were given by the journal, the tables were formatted according to APA 6th edition. Author guidelines are presented in Thesis Appendix 2.

The use of research methods in psychological research: A systematised review

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Abstract

This systematised review aimed to determine what research methods are being used, how these methods are being used and for what topics in the field of psychology. The use of research methods is an important topic as it influences not only the outcome of research projects, but what young researchers are taught about how to conduct research methodology. Our review of 999 articles from five journals over a period of five years indicated that psychology research is conducted in ten topics via predominantly quantitative research methods. Of these ten topics, social psychology was the most popular. This article highlights the popularity and application of methods and designs throughout the article sample as well as an unexpected lack of rigour with regard to most aspects of methodology.

Keywords: research methods, research approach, research trends, psychological research, systematised review, research designs, research topic

1 Introduction

Psychology is an ever growing and popular field (Clay, 2017; Gough & Lyons, 2016). Due to this growth and the need for science-based research to base health decisions on (Perestelo-Pérez, 2013), the use of research methods in the broad field of psychology is an important point of investigation (Aanstoos, 2014; Stangor, 2011). As such, different views have arisen on what research methods, as well as when and how these research methods are employed. Research methods are viewed as imperative tools used by researchers to collect data (Nieuwenhuis, 2016) and include the following: quantitative, qualitative, mixed method and multi method (Maree, 2016). Additionally, researchers also employ various types of literature reviews to address research questions (Grant & Booth, 2009).

According to literature, what research method is used and why a certain research method is used is complex as it depends on various factors that may include paradigm (0'Neil & Koekemoer, 2016), research question (Grix, 2002), or the skill and exposure of the researcher (Nind, Kilburn, & Wiles, 2015). How these research methods are employed is also difficult to discern as research methods are often depicted as having fixed boundaries that are continuously crossed in research (Johnson, Long, & White, 2001; Sandelowski, 2011). Examples of this crossing include adding quantitative aspects to qualitative studies (Sandelowski, Voils, & Knafl, 2009), or stating that a study used a mixed-method design without the study having any characteristics of this design (Truscott et al., 2010).

The inept use of research methods affects how students and researchers improve and utilise their research skills (Scott Jones & Goldring, 2015), how theories are developed (Ngulube, 2013), and the credibility of research results (Levitt, Motulsky, Wetz, Morrow, & Ponterotto, 2017). This, in turn, can be detrimental to the field (Nind et al., 2015), journal publication (Ezeh et al., 2010; Ketchen jr., Boyd, & Bergh, 2008), and attempts to address public social issues through psychological research (Dweck, 2017). This is especially important given the now well-known replication crisis the field is facing (Earp & Trafimow, 2015; Hengartner, 2018).

Due to this lack of clarity on method use and the potential impact of inept use of research methods, the aim of this study was to determine the use of research methods in the field of psychology by providing an overview of how methods are being applied. Accordingly, our research focused on answering what research methods are being used, how these methods are being used and for what topics in practice (i.e., journal publications). We synthesised the collected data into the following format: *research topic* (areas of scientific discourse in a field or the current needs of a population [Bittermann & Fischer, 2018]), *method* (data-gathering tools [Nieuwenhuis, 2016]), *sampling* (elements chosen from a population to partake in research [Ritchie, Lewis, & Elam , 2009]), *data collection* (techniques and research strategy [Maree, 2016]) and *data analysis* (discovering information by examining bodies of data [Kte'pi, 2016]). A systematised review of recent articles (2013 to 2017) collected from five different journals in the field of psychological research was conducted.

2 Method

2.1 Design

Grant and Booth (2009) describe systematised review as the review of choice for post-graduate studies, which is employed using some elements of a systematic review and seldom more than one or two databases to catalogue studies after a comprehensive literature search. The aspects used in this systematised review that are similar to that of a systematic review were a comprehensive search within the chosen database and data produced in tabular form (Grant & Booth, 2009).

2.2 Sampling

Sample sizes and timelines vary in systematised reviews (see Barr-Walker, 2017; Lowe & Moore, 2014; Pericall & Taylor, 2014). With no clear parameters identified in literature (see Grant & Booth, 2009), the sample size of this study was determined by the purpose of the sample (Strydom, 2011), and time and cost constraints (Maree & Pietersen, 2016). Thus, a non-probability purposive sample (Ritchie et al., 2009) of the top five psychology journals from 2013 to 2017 was included in this research study. Per Lee (2015) American Psychological Association (APA) recommends the use of the most up-to-date sources for data collection with consideration of the context of the research study. As this research study focused on the most recent trends in research methods used in the broad field of psychology, the identified time frame was deemed appropriate.

Psychology journals were only included if they adhered to the following inclusion criteria: formed part of the top five English journals in the miscellaneous psychology domain of the SCImago Journal & Country Rank (SCImago Journal & Country Rank, 2017). The SCImago Journal & Country Rank provides a yearly updated list of publicly accessible journal and country specific indicators derived from the Scopus® database (Scopus, 2017b) by means of the SCImago Journal Rank (SJR) indicator developed by SCImago from the algorithm Google PageRank™ (SCImago Journal & Country Rank, 2017). The listing order therefore changes yearly. Scopus is the largest global database of abstracts and citations from peer-reviewed journals (Scopus, 2017a). Reasons for the development of the SCImago Journal & Country Rank list was to allow researchers to assess scientific domains, compare country rankings, and compare and analyse journals (SCImago Journal & Country Ranking, 2017), which supported the aim of this research study.

The following list of top five journals in 2018 fell within the abovementioned inclusion criteria 1) Australian Journal of Psychology, 2) British Journal of Psychology, 3) Europe's Journal of Psychology, 4) International Journal of Psychology and lastly the 5) Journal of Psychology Interdisciplinary and Applied.

Journals were excluded from this systematised review if no full-text versions of their articles were available, if journals explicitly stated a publication preference for certain research methods, or if the journal only published articles in a specific discipline of psychological research (for example, industrial psychology, clinical psychology etc.). Including journals from specific disciplines may introduce bias in the categorisation of topics.

2.3 Procedure

The researchers followed a procedure (see Figure 1, Appendix 2) adapted from that of (Ferreira, Bessa, Drezett, & De Abreu, 2016) for systematised reviews. Data collection and categorisation commenced after ethical approval of this study on 4 December 2017 and continued until 30 June 2019. All the data was systematically collected and coded (Grant & Booth, 2009) by the first author, with an independent person acting as co-coder and secondary authors ensuring that the ethically approved procedure was followed. Codes of interest included the research topic, method used, design used, sampling method, and methodology (method used for data collection and data analysis). These codes were derived from the wording in each article. Themes were created based on the derived codes and checked by the co-coder. Lastly, these themes were catalogued into a table as per the systematised review design.

2.4 Rigour

According to Johnston, Kelly, Hsieh, Skidmore and Wells (2019), "literature screening, selection, and data extraction/analyses" (p.7) are specifically tailored to the aim of a review. Therefore, the steps followed in a systematic review must be reported in a comprehensive and transparent manner. The chosen systematised design adhered to the rigour expected from systematic reviews with regard to comprehensive search and data produced in tabular form (Grant & Booth, 2009). The rigorous application of the systematic review is therefore discussed in relation to these two elements.

Firstly, to ensure a comprehensive search, this research study promoted review transparency by following a clear protocol outlined according to each review stage before collecting data (Johnston et al., 2019). This protocol was similar to that of Ferreira et al. (2016) and approved by three research committees/stakeholders and the researchers (Johnston et al., 2019). The eligibility criteria for article inclusion was based on the research question and clearly stated, and the process of inclusion was recorded on an electronic spreadsheet to create an evidence trail (Johnston et al., 2019; Bandara, Furtmueller, Gorbacheva, Miskon, & Beekhuyzen, 2015). Microsoft Excel spreadsheets are a popular tool for review studies and can increase the rigour of the review process (Bandara et al., 2015). Screening for appropriate articles for inclusion forms an important part of a systematic review process (Johnston et al., 2019). This step was applied to two aspects of this research study: the choice of eligible journals and articles to be included. Eligible journals were selected by the first author and reviewed by the second and third authors. Initially, all articles from the chosen journals were included. Then, by process of elimination, those irrelevant to the research aim, i.e. interview articles or discussions etc., were excluded.

To ensure rigorous data extraction, data was first extracted by one reviewer and an independent person verified the results for completeness and accuracy (Johnston, Kelly, Hsieh, Skidmore, & Wells, 2019). The research question served as a guide for efficient, organised data extraction (Johnston et al., 2019). Data was categorised according to the codes of interest, along with article identifiers for audit trails such as authors, title and aims of articles. The categorised data was based on the aim of the review (Johnston et al., 2019) and synthesised in tabular form under methods used, how these methods were used, and for what topics in the field of psychology.

3. Results

The initial search produced a total of 1145 articles from the 5 journals identified. Inclusion and exclusion criteria resulted in a final sample of 999 articles (Figure 2, Appendix 2). Articles were co-coded into 84 codes, from which 10 themes were derived (Table 1, Appendix 1).

These 10 themes represent the *topic* section of our research question (Figure 3, Appendix 2). All these topics except for the final one, *psychological practice*, were found to concur with the research areas in psychology as identified by Weiten (2010). These research areas were chosen to represent the derived codes as they provided broad definitions that allowed for clear, concise categorisation of the vast amount of data. Article codes were categorised under particular themes/ topics if they adhered to the research area definitions created by Weiten (2010). It is important to note that these areas of research do not refer to specific disciplines in psychology, such as industrial psychology; but to broader fields that may encompass sub-interests of these disciplines.

In the case of *developmental psychology*, researchers conduct research into human development from childhood to old age. *Social psychology* includes research on behaviour governed by social drivers. Researchers in the field of *educational psychology* study how people learn and the best way to teach them. *Health psychology* aims to determine the effect of psychological factors on physiological health. *Physiological psychology*, on the other hand, looks at the influence of physiological aspects on behaviour. *Experimental psychology* is not the only theme that uses experimental research and focuses on the traditional core topics of psychology (for example sensation). *Cognitive psychology* studies the higher mental processes. *Psychometrics* is concerned with measuring capacity or behaviour. *Personality* research aims to assess and describe consistency in human behaviour (Weiten, 2010). The final theme of *psychological practice* refers to the experiences, techniques and interventions employed by practitioners, researchers and academia in the field of psychology.

Articles under these themes were further subdivided into methodologies: method, sampling, design, data collection and data analysis. The categorisation was based on information stated in the articles and not inferred by the researchers. Data was compiled into two sets of results presented in this article. The first set addresses the aim of this study from the perspective of the topics identified. The second set of results represents a broad overview of the results from the perspective of the methodology employed. The second set of results are discussed in this article, while the first set is presented in table format. The discussion thus provides a broad overview of methods use in psychology (across all themes), while the table format provides readers with in-depth insight into methods used in the individual themes identified. We believe that presenting the data from both perspectives allow readers a broad understanding of the results. Due to the large amount of information that make up our results, we followed Cichocka and Jost (2014) in simplifying our results. Please note that the numbers indicated in the table in terms of methodology differ from the total number of articles. Some articles employed more than one method/ sampling technique / design / data collection method / data analysis in their studies.

What follows is the results for *what methods are used, how these methods are used, and which topics in psychology they are applied to*. Percentages are reported to the second decimal in order to highlight small differences in the occurrence of methodology.

Firstly, with regard to the *research methods* used, our results show that researchers are more likely to use quantitative research methods (90.22%) compared to all other research methods. Qualitative research was the second most common research method but only made up about 4.79% of the general method usage. Reviews occurred almost as much as qualitative studies (3.91%), as the third most popular method. Mixed-methods research studies (0.98%) occurred across most themes, whereas multi-method research was indicated in only one study and amounted to 0.10% of the methods identified. The specific use of each method in the topics identified is indicated in Table 2 and Figure 4 (Appendix 1 & 2).

Secondly, in the case of *how these research methods are employed*, our study indicated the following:

Sampling – 78.34% of the studies in the collected articles did not specify a sampling method. From the remainder of the studies, 13 types of sampling methods were identified. These sampling methods included broad categorisation of a sample as, for example, a probability or non-probability sample. General samples of convenience were the methods most likely to be applied (10.34%), followed by random sampling (3.51%), snowball sampling (2.73%), and purposive (1.37%) and cluster sampling (1.27%). The remainder of the sampling methods occurred to a more limited extent (0-1.0%). See Table 3 and Figure 5 (Appendix 1 & 2) for sampling methods employed in each topic.

Designs were categorised based on the articles' statement thereof. Therefore, it is important to note that, in the case of quantitative studies, non-experimental designs (25.55%) were often indicated due to a lack of experiments and any other indication of design, which, according to Laher (2016), is a reasonable categorisation. Non-experimental designs should thus be compared with experimental designs only in the description of data, as it could include the use of correlational/cross-sectional designs, which were not overtly stated by the authors. For the remainder of the research methods, 'not stated' (7.12%) was assigned to articles without design types indicated.

From the 36 identified designs the most popular designs were cross-sectional (23.17%) and experimental (25.64%), which concurred with the high number of quantitative studies. Longitudinal studies (3.80%), the third most popular design, was used in both quantitative and qualitative studies. Qualitative designs consisted of ethnography (0.38%), interpretative phenomenological designs / phenomenology (0.28%), as well as narrative designs (0.28%). Studies that employed the review method were mostly categorised as 'not stated' as they did not indicate any type of review design, with the most often stated review designs being systematic reviews (0.57%). The few mixed method studies employed exploratory (0.19%), explanatory (0.09%), and concurrent designs (0.19%), with some studies referring to separate designs for the qualitative and quantitative methods. The one study that identified itself as a multi-method study used a longitudinal design. Please see how these designs were employed in each specific topic in Table 4, Figure 6 (Appendix 1 & 2).

Data collection and analysis – data collection included 30 methods, with the data collection method most often employed being questionnaires (57.84%). The experimental task (16.56%) was the second most preferred collection method, which included established or unique tasks designed by the researchers. Cognitive ability tests (6.84%) were also regularly used along with various forms of interviewing (7.66%). Table 5 and Figure 7 (Appendix 1 & 2) represent data collection use in the various

topics. Data analysis consisted of 3857 occurrences of data analysis categorised into ±188 various data analysis techniques shown in Table 6 and Figures 8 -17 (Appendix 1 & 2). Descriptive statistics were the most commonly used (23.49%) along with correlational analysis (17.19%). When using a qualitative method, researchers generally employed thematic analysis (0.52%) or different forms of analysis that led to coding and the creation of themes. Review studies presented few data analysis methods, with most studies categorising their results. Mixed method and multi-method studies followed the analysis methods identified for the qualitative and quantitative studies included.

Results of the topics researched in psychology can be seen in the tables, as previously stated in this article. It is noteworthy that, of the ten topics, social psychology accounted for 43.54% of the studies, with cognitive psychology the second most popular research topic at 16.92%. The remainder of the topics only occurred in 4.0% - 7.0% of the articles considered. A list of the included 999 articles is available under the section "View Articles" on the following website: https://methodgarden.xtrapolate.io/. This website was created by Scholtz, De Klerk and De Beer (2019) to visually present a research framework based on this Article's results.

4. Discussion

This systematised review categorised full-length articles from five identified journals across the span of five years to provide insight into the use of research methods in the field of psychology. To our knowledge, this is the first research study to address this topic in this manner. Our discussion attempts to promote a productive way forward in terms of the key results for method use, especially in the field of academia (Holloway, 2008).

With regard to the methods used, our data stayed true to literature, finding only familiar research methods (Grant & Booth, 2009; Maree, 2016) that varied in the degree to which they were employed. Quantitative research was found to be the most popular method, as indicated by literature (Breen & Darlaston-Jones, 2010: Counsell & Harlow, 2017). Its long history as the first research method (Leech & Onwuegbuzie, 2007) in the field of psychology as well as researchers' current application of mathematical approaches in their studies (Toomela, 2010) might contribute to its popularity today. Whatever the case may be, our results show that, despite the growth in qualitative research (Demuth, 2015: Smith & McGannon, 2018), quantitative research remains the first choice.

The high occurrence of reviews was an unexpected result, even surpassing that of multi-method and mixed method studies. Tashakkori and Teddlie (2003) considers mixed method research the third most utilised research method. According to Grant and Booth (2009), the increased awareness, journal contribution calls as well as its efficiency in procuring research funds all promote the popularity of reviews. Despite its low occurrence, which may be due to its relative novelty, the application of mixed methods was methodologically clear in all cases (Ivankova, Creswell, & Plano Clark, 2016). Its' low occurrence in this sample could be due to opposing views on mixing methods (Gunasekare, 2015) or that authors prefer publishing in mixed method journals, when using this method. However, the combination of methodologies that are not mixed or multi-method studies occurred in a substantial number of the studies.

Perceived fixed boundaries are often set aside in order to investigate the aim of a study, which could create a new and helpful way of understanding the world (Gunasekare, 2015). According to Toomela (2010, this is not unheard of and could be considered a form of 'structural systemic science', as in the case of qualitative methodology (observation) applied in quantitative studies (experimental design).

Discerning the use of research methods or how these methods are applied, presented some difficulty. In the case of sampling, most studies – regardless of method – did mention some form of inclusion and exclusion criteria, but no definite sampling method. This result, along with the fact that samples often consisted of students from the researchers' own academic institutions, concurs with literature and debates among academics (Laher, 2016; Peterson & Merunka, 2014). Samples of convenience and students as participants raise questions about the generalisability and applicability of results (Peterson & Merunka, 2014). Attention to sampling is important as inappropriate sampling can debilitate the legitimacy of interpretations (Onwuegbuzie & Collins, 2017).

Additionally, and this is indicated in Table 6, articles seldom report the research designs used. Results demonstrate a preference for certain designs, such as cross-sectional designs for quantitative studies. The more pressing aspect of our results is the lack of rigour in reporting designs. Omitting parts of the research process in publication when it could have been used to improve research skills should be questioned, and the possibility of replicating results should be considered. Publications are often rejected due to a lack of rigour in the applied method and designs (Fonseca 2013, Laher, 2016), calling for increased clarity and knowledge of method application. Replication is a critical part of any field of scientific research and requires the "complete articulation" of the study methods used (Drotar, 2010, p.804). The lack of thorough description could be explained by the requirements of certain journals to only report on certain aspects of a research process, especially with regard to the applied design (Laher, 20). However, naming aspects such as sampling and designs, is a requirement according to the APA's Journal Article Reporting Standards (JARS-Quant) (Applebaum et al., 2018). With very little information on how a study was conducted, authors lose a valuable opportunity to enhance research validity, enrich the knowledge of others, and contribute to the growth of psychology and methodology as a whole. In the case of this research study, it also restricted our results to only reported samples and designs.

Data collection and analysis were mostly clearly stated in the sampled articles. A key result was the versatile use of questionnaires. Researchers would apply a questionnaire in various ways, for example in questionnaire interviews, online surveys, and written questionnaires across most research methods. This may highlight a trend in future research.

With regard to the topics these methods were employed for, our research study found a new field named 'psychological practice'. This result may show the growing consciousness of researchers as part of the research process (Denzin & Lincoln, 2003), psychological practice and knowledge generation as these studies typically focused on the researchers' role and practice. The most popular of these topics is social psychology, which is generously covered in journals and by learning societies, as testaments of the institutional support and richness social psychology has in the field of psychology

(Chryssochoou, 2015). The APA's perspective on 2018 trends in psychology also identifies an increased amount of psychology focus on how social determinants are influencing people's health (Deangelis, 2017).

5. Conclusion

Our research study presented the use of research methods in the field of psychology. Thereby providing information on the complex questions identified in literature, regarding what methods are used how these methods are being used and for what topics (why). Certain methods were found to follow a clearly set process, others followed no set process and some studies used a more fluid application of a combination of methodologies. Our sample showed that the current trend in psychology research favours certain topics and methods above others. However, academia should not be so concerned about the best method, but how it is applied (Walsh, 2011). To illustrate this, the study highlighted the lack of reporting and a clear methodology. This lack of clarity was represented in-depth for each step in the research process through this study and can be of vital importance to address the current replication crisis within the field of psychology.

6. Limitations and recommendations

The first limitation of this research study was the use of a systematised review design, for which literature has not yet established a standardised process to follow. The researchers had to base their review process on that of previously published systematised reviews, which added to the rigour of the research study. A second limitation was the use of the five specific journals to address the aim of the research study, which signified a bias towards the research methods published in these specific journals only and limited generalisability. However, these journals were the top five journals in terms of the inclusion criteria. A broader sample of journals over a different period of time might provide different results. A third limitation is the use of Excel spreadsheets and an electronic system to log articles, which was a manual process and therefore left room for error (Bandara et al., 2015). To address this potential issue, co-coding was performed to reduce error. Lastly, this article categorised data based on the information presented in the article sample; there was no interpretation of what methodology could have been applied or whether the methods stated adhered to the criteria for the methods used. Thus, a large number of articles that did not clearly indicate a research method or design could influence the results of this review. However, this in itself was also a noteworthy result. Future research could review research methods of a broader sample of journals with an interpretive review tool that increases rigour. Further investigation into why certain methods are preferred by researchers would also contribute to our understanding of the use of research methods. It is also strongly recommended that further studies focus on why the methodology of studies are insufficiently reported and how it affects research in psychology. Additionally, the authors also encourage the future use of systematised review designs as a way to promote a concise procedure in applying this design.

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Appendix 1

Table 1. Codes used to form themes (research topics)

Theme	Code amount	Codes
Social Psychology	31	Aggression SP, Attitude SP, Belief SP, Child abuse SP, Conflict SP, Culture SP, Discrimination SP, Economic, Family illness, Family, Group, Help, Immigration, Intergeneration, Judgement, Law, Leadership, Marriage SP, Media, Optimism, Organisational and Social justice, Parenting SP, Politics, Prejudice, Relationships, Religion, Romantic Relationships SP, Sex and attraction, Stereotype, Violence, Work
Experimental Psychology	17	Anxiety, stress and PTSD, Coping, Depression, Emotion, Empathy, Facial research, Fear and threat, Happiness, Humor, Mindfulness, Mortality, Motivation and Achievement, Perception, Rumination, Self, Self-efficacy
Cognitive Psychology	12	Attention, Cognition, Decision making, Impulse, Intelligence, Language, Math, Memory, Mental, Number, Problem solving, Reading.
Health Psychology	7	Addiction, Body, Burnout, Health, Illness (Health Psychology), Sleep (Health Psychology), Suicide and Self-harm
Physiological Psychology	6	Gender, Health (Physiological psychology), Illness (Physiological psychology), Mood disorders, Sleep (Physiological psychology), Visual research
Developmental Psychology	3	Attachment, Development, Old age
Personality	3	Machiavellian, Narcissism, Personality
Psychological Practice	3	Programme, Psychology practice, Theory
Education and Learning	1	Education and Learning
Psychometrics	1	Measure
Code Total:	**84**	

Table 2. Research methods in psychology

Research Method	Social Psychology	Cognitive Psychology	Psychometrics	Experimental Psychology	Physiological Psychology	Health Psychology	Developmental Psychology	Psychological Practice	Personality	Education and Learning
Quantitative	401	162	69	60	52	52	48	28	38	13
Qualitative	28	4	1	0	5	2	3	5	0	1
Review	11	5	2	0	3	4	1	13	0	1
Mixed Methods	7	0	0	0	1	0	1	1	0	0
Multi-method	0	0	0	0	0	0	0	0	1	0
Total	**447**	**171**	**72**	**60**	**61**	**58**	**53**	**47**	**39**	**15**

Table 3. Sampling use in the field of psychology

Sampling Method	Social Psychology	Cognitive Psychology	Psychometrics	Experimental Psychology	Physiological Psychology	Health Psychology	Developmental Psychology	Psychological Practice	Personality	Education and Learning
Not stated	331	153	45	57	49	43	43	38	31	14
Convenience sampling	55	8	10	1	6	8	9	2	6	1
Random sampling	15	3	9	1	2	2	0	2	1	1
Snowball sampling	14	4	4	1	2	0	0	3	0	0
Purposive sampling	6	0	2	0	0	2	0	3	1	0
Cluster sampling	8	1	2	0	0	2	0	0	0	0
Stratified sampling	4	1	2	0	1	1	0	0	0	0
Non-probability sampling	4	0	1	0	0	0	0	0	1	0
Probability sampling	3	1	0	0	0	0	0	0	0	0
Quota sampling	1	0	1	0	0	0	0	0	0	0
Criterion sampling	1	0	0	0	0	0	0	0	0	0
Self-selection sampling	1	0	0	0	0	0	0	0	0	0
Unsystematic sampling	0	1	0	0	0	0	0	0	0	0
Total	**443**	**172**	**76**	**60**	**60**	**58**	**52**	**48**	**40**	**16**

Table 4. Design use in the field of psychology

Research Design	Social Psychology	Cognitive Psychology	Psychometrics	Experimental Psychology	Physiological Psychology	Health Psychology	Developmental Psychology	Psychological Practice	Personality	Education and Learning
Experimental design	82	82	3	60	10	12	8	6	4	3
Non-experimental design	115	30	51	0	13	17	13	13	14	3
Cross-sectional design	123	31	12	1	19	17	21	5	13	2
Correlational design	56	12	3	0	10	2	2	0	4	2
Not stated	37	7	3	0	4	2	4	14	1	3
Longitudinal design	21	6	2	1	1	2	2	0	2	3
Quasi-experimental design	4	1	0	0	0	0	2	1	0	0
Systematic review	3	0	0	0	1	1	0	1	0	0
Cross-cultural design	3	0	0	1	0	0	0	1	0	0
Descriptive design	2	0	0	0	0	0	3	0	0	0
Ethnography	4	0	0	0	0	0	0	0	0	0
Literature review	1	1	0	0	1	1	0	0	0	0
Interpretative Phenomenological Analysis (IPA)	2	0	0	0	1	0	0	0	0	0
Narrative design	1	0	0	0	0	0	1	1	0	0
Case-control research design	0	0	0	0	0	2	0	0	0	0

Research Design	Social Psychology	Cognitive Psychology	Psychometrics	Experimental Psychology	Physiological Psychology	Health Psychology	Developmental Psychology	Psychological Practice	Personality	Education and Learning
Concurrent data collection design	1	0	0	0	1	0	0	0	0	0
Grounded Theory	1	0	0	0	1	0	0	0	0	0
Narrative review	0	1	0	0	0	1	0	0	0	0
Auto-ethnography	1	0	0	0	0	0	0	0	0	0
Case series evaluation	0	0	0	0	0	0	0	1	0	0
Case study	1	0	0	0	0	0	0	0	0	0
Comprehensive review	0	1	0	0	0	0	0	0	0	0
Descriptive-inferential	0	0	0	0	0	0	0	0	1	0
Explanatory sequential design	1	0	0	0	0	0	0	0	0	0
Exploratory mixed-method	0	0	0	0	1	0	0	1	0	0
Grounded ethnographic design	0	1	0	0	0	0	0	0	0	0
Historical cohort design	0	1	0	0	0	0	0	0	0	0
Historical research	0	0	0	0	0	0	0	1	0	0
interpretivist approach	0	0	0	0	0	0	0	1	0	0
Meta-review	1	0	0	0	0	0	0	1	0	0
Prospective design	1	0	0	0	0	0	0	0	0	0

Research Design	Social Psychology	Cognitive Psychology	Psychometrics	Experimental Psychology	Physiological Psychology	Health Psychology	Developmental Psychology	Psychological Practice	Personality	Education and Learning
Qualitative review	0	0	0	0	0	0	0	1	0	0
Qualitative systematic review	0	0	0	0	0	1	0	0	0	0
Short-term prospective design	0	1	0	0	0	0	0	0	0	0
Total	**461**	**175**	**74**	**63**	**63**	**58**	**56**	**48**	**39**	**16**

Table 5. Data collection in the field of psychology

Data Collection	Social Psychology	Cognitive Psychology	Psychometrics	Experimental Psychology	Physiological Psychology	Health Psychology	Developmental Psychology	Psychological Practice	Personality	Education and Learning
Questionnaire	364	113	65	42	40	51	39	24	37	11
Experimental task	68	66	3	52	9	5	11	5	5	1
Cognitive ability test	9	57	1	12	6	1	5	1	1	0
Physiological measure	3	12	1	6	2	5	3	0	1	0
Interview	19	3	0	1	3	0	2	2	0	1
Online scholarly literature	10	4	0	0	3	4	0	10	0	0
Open-ended questions	15	3	0	1	3	1	2	3	0	0
Semi-structured interviews	10	3	0	0	3	2	1	2	0	1
Observation	10	1	0	0	0	0	0	0	2	0
Documents	5	1	1	0	0	0	0	1	2	0
Focus group	6	1	2	0	1	0	0	0	0	0
Not stated	2	1	1	0	0	0	1	4	0	1
Public data	6	1	0	0	0	0	0	2	0	1
Drawing task	0	2	0	1	1	1	0	2	0	0
In-depth interview	6	0	0	0	1	0	0	0	0	0
Structured interview	0	2	0	0	1	2	0	0	1	0

Data Collection	Social Psychology	Cognitive Psychology	Psychometrics	Experimental Psychology	Physiological Psychology	Health Psychology	Developmental Psychology	Psychological Practice	Personality	Education and Learning
Writing task	1	0	0	0	4	0	0	1	0	0
Questionnaire interviews	1	0	1	0	2	0	1	0	0	0
Non-experimental task	4	0	0	0	0	0	0	0	0	0
Tests	2	2	0	0	0	0	0	0	0	0
Group accounts	2	0	0	0	0	0	0	1	0	0
Open-ended prompts	1	1	0	0	0	0	0	1	0	0
Field notes	2	0	0	0	0	0	0	0	0	0
Open-ended interview	2	0	0	0	0	0	0	0	0	0
Qualitative questions	0	0	0	0	0	1	0	0	0	1
Social media	1	0	0	0	0	0	0	0	1	0
Assessment procedure	0	0	0	1	0	0	0	0	0	0
Closed-ended questions	0	0	0	0	0	0	0	1	0	0
Open discussions	1	0	0	0	0	0	0	0	0	0
Qualitative descriptions	1	0	0	0	0	0	0	0	0	0
Total	**551**	**273**	**75**	**116**	**79**	**73**	**65**	**60**	**50**	**17**

Table 6. Data analysis in the field of psychology

Data Analysis	Social Psychology	Cognitive psychology	Psychometrics	Experimental psychology	Physiological Psychology	Health Psychology	Developmental Psychology	Psychological Practice	Personality	Education and Learning
Not stated	5	1	2	0	0	1	1	5	0	1
Actor-Partner Interdependence Model (APIM)	4	0	0	0	0	0	0	0	0	0
Analysis of Covariance (ANCOVA)	17	8	1	3	4	2	1	0	0	1
Analysis of Variance (ANOVA)	112	60	16	29	15	17	15	6	5	3
Auto-regressive path coefficients	0	0	1	0	0	0	0	0	0	0
Average variance extracted (AVE)	1	0	0	0	0	1	0	0	0	0
Bartholomew's classification system	1	0	0	0	0	0	0	0	0	0
Bayesian analysis	3	0	0	0	1	0	0	0	0	0
Bibliometric analysis	1	1	0	0	0	0	0	1	0	0
Binary logistic regression	1	1	0	0	1	4	1	0	0	0
Binary multilevel regression	0	0	0	1	0	0	0	0	0	0
Binomial and Bernoulli regression models	2	0	0	0	0	0	0	0	0	0
Binomial mixed effects model	1	0	0	0	0	0	0	0	0	0
Bivariate Correlations	32	10	3	0	4	3	5	1	1	1
Bivariate logistic correlations	1	0	0	0	0	1	0	0	0	0
Bootstrapping	39	16	2	3	5	1	6	1	2	1
Canonical correlations	0	0	0	0	0	0	0	0	2	0

Data Analysis	Social Psychology	Cognitive psychology	Psychometrics	Experimental psychology	Physiological Psychology	Health Psychology	Developmental Psychology	Psychological Practice	Personality	Education and Learning
Cartesian diagram	1	0	0	0	0	0	0	0	0	0
Case-wise diagnostics	0	1	0	0	0	0	1	0	0	0
Casual network analysis	0	0	0	1	0	0	0	0	0	0
Categorization	5	2	0	0	1	1	0	4	0	0
Categorization of responses	2	0	0	0	0	0	0	0	0	0
Category codes	3	1	0	0	0	1	0	0	0	0
Cattell's scree-test	0	0	1	0	0	0	0	0	0	0
Chi-square tests	52	20	17	5	6	11	8	7	4	3
Classic Parallel Analysis (PA)	0	0	1	0	0	1	0	0	1	0
Cluster analysis	7	0	0	0	1	1	1	1	0	1
Coded	15	3	1	2	1	1	1	2	1	0
Cohen d effect size	14	5	2	1	3	2	3	1	0	1
Common method variance (CMV)	5	0	1	0	0	0	0	0	0	0
Comprehensive Meta-Analysis (CMA)	0	0	0	0	0	0	0	0	1	0
Confidence Interval (CI)	2	0	0	0	0	1	0	0	0	0
Confirmatory Factor Analysis (CFA)	57	13	40	0	2	4	7	1	3	1
Content analysis	9	1	0	0	2	1	0	1	0	0
Convergent validity	1	0	0	0	0	0	0	0	0	0
Cook's distance	0	1	0	0	1	0	0	0	0	0
Correlated-trait-correlated-method minus one model	1	0	0	0	0	0	0	0	0	0
Correlational analysis	259	85	44	18	27	31	34	8	33	8

Data Analysis	Social Psychology	Cognitive psychology	Psychometrics	Experimental psychology	Physiological Psychology	Health Psychology	Developmental Psychology	Psychological Practice	Personality	Education and Learning
Covariance matrix	3	0	1	0	0	0	0	0	0	0
Covariance modelling	0	1	1	0	0	0	0	0	0	0
Covariance structure analyses	2	0	0	0	0	0	0	0	0	0
Cronbach's alpha	61	14	18	6	5	10	8	3	7	5
Cross-validation	0	0	2	0	0	0	0	0	0	1
Cross-lagged analyses	1	2	1	0	0	0	1	0	0	0
Dependent t-test	1	2	0	0	1	1	0	1	0	0
Descriptive statistics	324	132	43	49	41	43	36	28	29	10
Differentiated analysis	0	0	0	0	0	0	1	0	0	0
Discriminate analysis	1	0	2	0	0	0	0	0	0	1
Discursive psychology	1	0	0	0	0	0	0	0	0	0
Dominance analysis	1	0	0	0	0	0	0	0	0	0
Expectation maximisation	2	1	0	0	0	0	0	1	0	0
Exploratory data Analysis	1	1	0	0	1	1	0	0	0	0
Exploratory Factor Analysis (EFA)	14	5	24	0	1	1	4	0	4	0
Exploratory structural equation modelling (ESEM)	0	0	1	0	0	0	0	0	1	0
Factor analysis	12	4	16	0	2	1	5	0	2	0
Measurement invariance testing	0	0	0	0	0	0	0	0	0	0
Four-way mixed ANOVA	0	1	0	1	0	0	0	0	0	0
Frequency rate	20	1	4	2	1	2	2	2	0	0
Friedman test	1	0	0	0	0	0	0	0	0	0

Data Analysis	Social Psychology	Cognitive psychology	Psychometrics	Experimental psychology	Physiological Psychology	Health Psychology	Developmental Psychology	Psychological Practice	Personality	Education and Learning
Games-Howell Post Hoc	2	2	0	0	0	1	0	0	0	0
General linear model analysis	1	2	0	0	0	0	1	1	0	0
Greenhouse-Geisser correction	2	5	0	0	0	0	1	1	1	1
Grounded theory method	0	0	0	0	0	0	0	0	0	1
Grounded theory methodology using open and axial coding	1	0	0	0	0	0	0	0	0	0
Guttman split-half	0	0	1	0	0	0	0	0	0	0
Harman's one-factor test	13	2	0	0	0	1	2	0	0	0
Herman's criteria of experience categorization	0	0	0	0	0	0	0	1	0	0
Hierarchical CFA (HCFA)	0	0	1	0	0	0	0	0	0	0
Hierarchical cluster analysis	1	0	0	0	0	0	0	0	0	0
Hierarchical Linear Modelling (HLM)	76	22	2	3	7	6	7	4	4	1
Huynh-Felt correction	1	0	0	0	0	0	0	0	0	0
Identified themes	3	0	0	0	1	0	0	0	0	0
Independent samples t-test	38	9	4	4	4	8	3	3	1	1
Inductive open coding	1	0	0	0	0	0	0	0	0	0
Inferential statistics	2	0	0	0	0	0	1	0	0	0
Interclass correlation	3	0	1	0	0	0	0	0	0	0
Internal consistency	3	1	2	0	0	0	0	0	0	0
Interpreted and defined	0	0	0	0	1	0	0	0	0	0

Data Analysis	Social Psychology	Cognitive psychology	Psychometrics	Experimental psychology	Physiological Psychology	Health Psychology	Developmental Psychology	Psychological Practice	Personality	Education and Learning
Interpretive Phenomenological Analysis (IPA)	2	1	0	0	1	0	0	0	0	0
Item fit analysis	1	0	5	0	0	0	0	0	0	0
K-means clustering	0	0	0	0	0	0	0	1	0	0
Kaiser-meyer-Olkin measure of sampling adequacy	2	0	8	0	0	0	2	0	2	0
Kendall's coefficients	3	1	0	0	0	0	0	0	0	0
Kolmogorov-Smirnov test	1	2	1	1	2	2	0	0	1	0
Lagged-effects multilevel modelling	1	1	0	0	0	0	0	0	0	0
Latent class differentiation (LCD)	1	0	0	0	0	0	0	0	0	0
Latent cluster analysis	0	0	0	0	0	1	0	0	0	0
Latent growth curve modelling (LGCM)	1	0	0	0	0	0	0	1	1	0
Latent means	1	0	0	0	0	0	0	0	0	0
Latent Profile Analysis (LPA)	1	1	0	0	0	0	0	0	0	0
Linear regressions	69	19	4	10	3	12	5	3	13	0
Linguistic Inquiry and Word Count	0	0	0	0	1	0	0	0	0	0
Listwise deletion method	0	0	0	0	0	1	0	0	0	0
Log-likelihood ratios	0	0	0	0	0	1	0	0	0	0
Logistic mixed-effects model	1	0	0	0	0	0	0	0	0	0
Logistic regression analyses	17	0	1	0	4	2	1	0	0	1

Data Analysis	Social Psychology	Cognitive psychology	Psychometrics	Experimental psychology	Physiological Psychology	Health Psychology	Developmental Psychology	Psychological Practice	Personality	Education and Learning
Loglinear Model	2	0	0	0	0	0	0	0	0	0
Mahalanobis distances	0	2	0	0	0	1	0	0	0	0
Mann-Whitney U tests	6	4	2	1	2	0	2	4	0	0
Mauchly's test	0	1	0	2	0	0	0	1	0	1
Maximum likelihood method	11	3	9	0	1	3	2	3	1	0
Maximum-likelihood factor analysis with promax rotation	0	1	0	0	0	0	0	0	0	0
Measurement invariance testing	4	1	1	0	1	0	0	0	0	0
Mediation analysis	29	7	1	2	4	3	5	0	3	0
Meta-analysis	3	0	1	0	0	0	0	1	0	0
Microanalysis	1	0	0	0	0	0	0	0	0	0
Minimum significant difference (MSD) post hoc comparison	0	1	0	0	0	0	0	0	0	0
Mixed ANOVAs	19	6	0	10	1	2	1	4	1	0
Mixed linear model	0	0	0	1	0	0	1	0	0	0
Mixed-design ANCOVA	1	1	0	0	0	0	0	0	0	0
Mixed-effects multiple regression models	1	0	0	0	0	0	0	0	0	0
Moderated hierarchical regression model	1	0	0	0	0	0	0	0	0	0
Moderated regression analysis	8	4	0	0	1	0	1	0	1	0
Monte Carlo Markov Chains	2	0	1	0	0	0	0	0	0	0
Multi-group analysis	3	0	0	0	0	0	0	0	0	0

Data Analysis	Social Psychology	Cognitive psychology	Psychometrics	Experimental psychology	Physiological Psychology	Health Psychology	Developmental Psychology	Psychological Practice	Personality	Education and Learning
Multidimensional Random Coefficient Multinomial Logit (MRCML)	0	0	1	0	0	0	0	0	0	0
Multidimensional Scaling	2	0	0	0	0	0	0	0	0	0
Multiple-Group Confirmatory Factor Analysis (MGCFA)	3	0	0	0	0	2	0	0	0	0
Multilevel latent class analysis	1	0	0	0	0	1	0	0	0	0
Multilevel modelling	7	2	1	1	1	0	0	1	1	0
Multilevel Structural Equation Modelling (MSEM)	2	0	0	0	0	0	0	0	0	0
Multinominal logistic regression (MLR)	1	0	0	0	0	0	0	0	0	0
Multinominal regression analysis	1	0	0	0	0	2	0	0	0	0
Multiple Indicators Multiple Causes (MIMIC)	0	0	0	0	1	1	0	0	0	0
Multiple mediation analysis	2	6	0	0	2	2	1	0	0	0
Multiple regression	34	15	3	0	3	4	5	0	7	2
Multivariate analysis of co-variance (MANCOVA)	12	2	1	1	0	1	1	0	1	0
Multivariate Analysis of Variance (MANOVA)	38	8	4	5	5	6	9	1	1	2
Multivariate hierarchical linear regression	1	1	0	0	0	0	0	0	0	0
Multivariate linear regression	0	1	0	0	0	0	1	0	0	0
Multivariate logistic regression analyses	1	0	0	0	0	0	0	0	0	0

Data Analysis	Social Psychology	Cognitive psychology	Psychometrics	Experimental psychology	Physiological Psychology	Health Psychology	Developmental Psychology	Psychological Practice	Personality	Education and Learning
Multivariate regressions	2	1	0	0	0	0	1	0	0	0
Nagelkerke's R square	0	0	0	0	0	1	0	0	0	0
Narrative analysis	1	0	0	0	0	0	1	0	0	0
Negative binominal regression with log link	0	0	0	0	0	1	0	0	0	0
Newman-Keuls	0	1	0	0	0	1	0	0	0	0
Nomological Validity Analysis	0	0	1	0	0	0	0	0	0	0
One sample t-test	8	10	1	7	4	6	4	0	1	0
Ordinary Least-Square regression (OLS)	2	2	0	1	0	0	0	0	0	0
Pairwise deletion method	0	0	0	0	0	1	0	0	0	0
Pairwise parameter comparison	4	0	0	0	0	0	2	0	0	0
Parametric Analysis	0	0	0	1	0	0	0	0	0	0
Partial Least Squares regression method (PLS)	1	1	0	0	0	0	0	0	0	0
Path analysis	21	9	0	1	2	4	5	1	2	0
Path-analytic model test	1	0	0	0	0	0	0	0	0	0
Phenomenological analysis	0	0	1	0	0	0	0	1	0	0
Polynomial regression analyses	1	0	0	0	0	0	0	0	0	0
Post-hoc Fisher LSD	0	1	0	0	0	0	0	0	0	0
Principal axis factoring	2	1	4	0	0	0	1	0	0	0
Principal component analysis (PCA)	8	1	12	1	1	0	3	2	5	1
Pseudo-panel regression	1	0	0	0	0	0	0	0	0	0

Data Analysis	Social Psychology	Cognitive psychology	Psychometrics	Experimental psychology	Physiological Psychology	Health Psychology	Developmental Psychology	Psychological Practice	Personality	Education and Learning
Quantitative content analysis	0	0	0	0	1	0	0	0	0	0
Receiver operating characteristic (ROC) curve analysis	2	0	0	1	0	0	0	0	0	0
Relative weight analysis	1	0	0	0	0	0	0	0	0	0
Repeated measures analyses of variances (rANOVA)	18	22	1	7	5	2	1	1	1	1
Ryan-Einot-Gabriel-Welsch multiple F test	1	0	0	0	0	0	0	0	0	0
Satorra-Bentler scaled chi-square statistic	0	0	3	0	0	0	0	0	0	0
Scheffe's test	3	0	0	0	0	1	0	0	0	0
Sequential multiple mediation analysis	1	0	0	0	0	0	0	0	0	0
Shapiro-Wilk test	2	3	0	2	1	0	0	0	0	0
Sobel Test	13	5	0	1	0	2	4	0	0	0
Squared multiple correlations	1	0	0	0	0	0	0	0	0	0
Squared semi-partial correlations (sr2)	2	0	0	0	0	0	0	0	0	0
Stepwise regression analysis	3	2	0	0	1	0	0	0	2	0
Structural Equation Modelling (SEM)	56	22	3	3	3	5	5	0	5	3
Structure analysis	0	0	0	0	0	0	1	0	0	0
Subsequent t-test	0	0	0	0	1	0	0	0	0	0
Systematic coding-Gemeinschaft-oriented	1	0	0	0	1	0	0	0	0	0
Task analysis	2	0	0	0	0	0	0	0	0	0

Data Analysis	Social Psychology	Cognitive psychology	Psychometrics	Experimental psychology	Physiological Psychology	Health Psychology	Developmental Psychology	Psychological Practice	Personality	Education and Learning
Thematic analysis	11	2	0	0	3	0	2	2	0	0
Three (condition)-way ANOVA	0	4	0	0	1	0	1	0	0	0
Three-way hierarchical loglinear analysis	0	2	0	0	0	0	0	0	0	0
Tukey-Kramer corrections	0	0	0	1	0	1	0	0	0	0
Two-paired sample t-test	7	6	1	1	0	3	1	1	0	1
Two-tailed related t-test	0	1	1	0	1	0	0	0	0	0
Unadjusted Logistic regression analysis	0	1	0	0	0	0	0	0	0	0
Univariate generalized linear models (GLM)	2	0	0	0	0	0	0	0	0	0
Variance inflation factor (VIF)	3	1	0	0	0	0	0	0	1	0
Variance-covariance matrix	1	0	0	0	0	0	0	1	0	0
Wald test	1	1	0	0	0	0	0	0	0	0
Ward's hierarchical cluster method	0	0	0	0	0	0	0	0	0	1
Weighted least squares with corrections to means and variances (WLSMV)	2	0	0	0	0	0	0	0	0	0
Welch and Brown-Forsythe F-ratios	0	1	0	0	0	1	0	0	0	0
Wilcoxon signed-rank test	3	3	0	2	0	0	0	2	0	1
Wilks' Lamba	6	0	0	0	0	0	1	0	0	0
Word analysis	0	0	0	0	0	0	0	1	0	0
Word Association Analysis	1	0	0	0	0	0	0	0	0	0
z scores	5	6	1	0	1	1	0	1	0	0

Data Analysis	Social Psychology	Cognitive psychology	Psychometrics	Experimental psychology	Physiological Psychology	Health Psychology	Developmental Psychology	Psychological Practice	Personality	Education and Learning
Total	**1738**	**635**	**329**	**192**	**198**	**237**	**225**	**117**	**152**	**55**

Appendix 2

Figure 1. Systematised review procedure

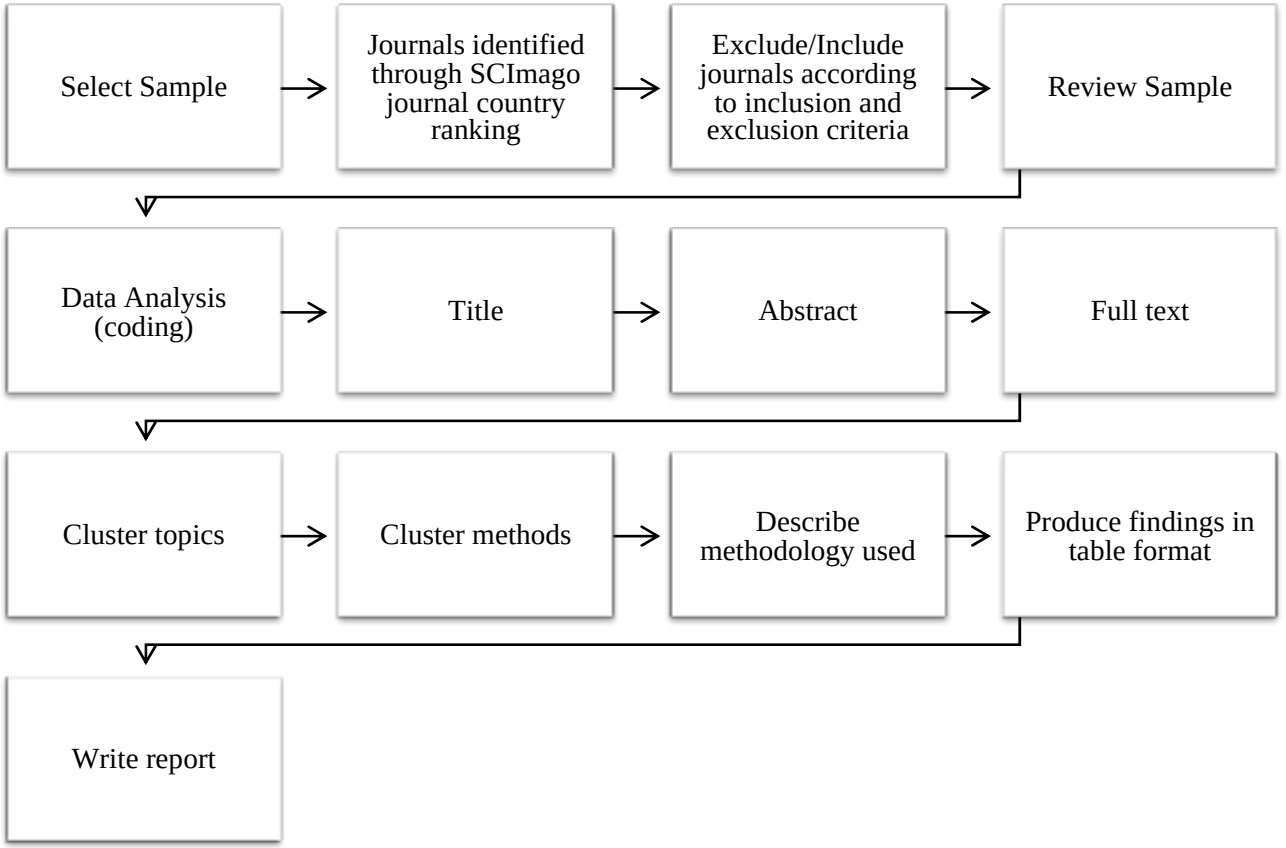


Figure 1. Journal article frequency

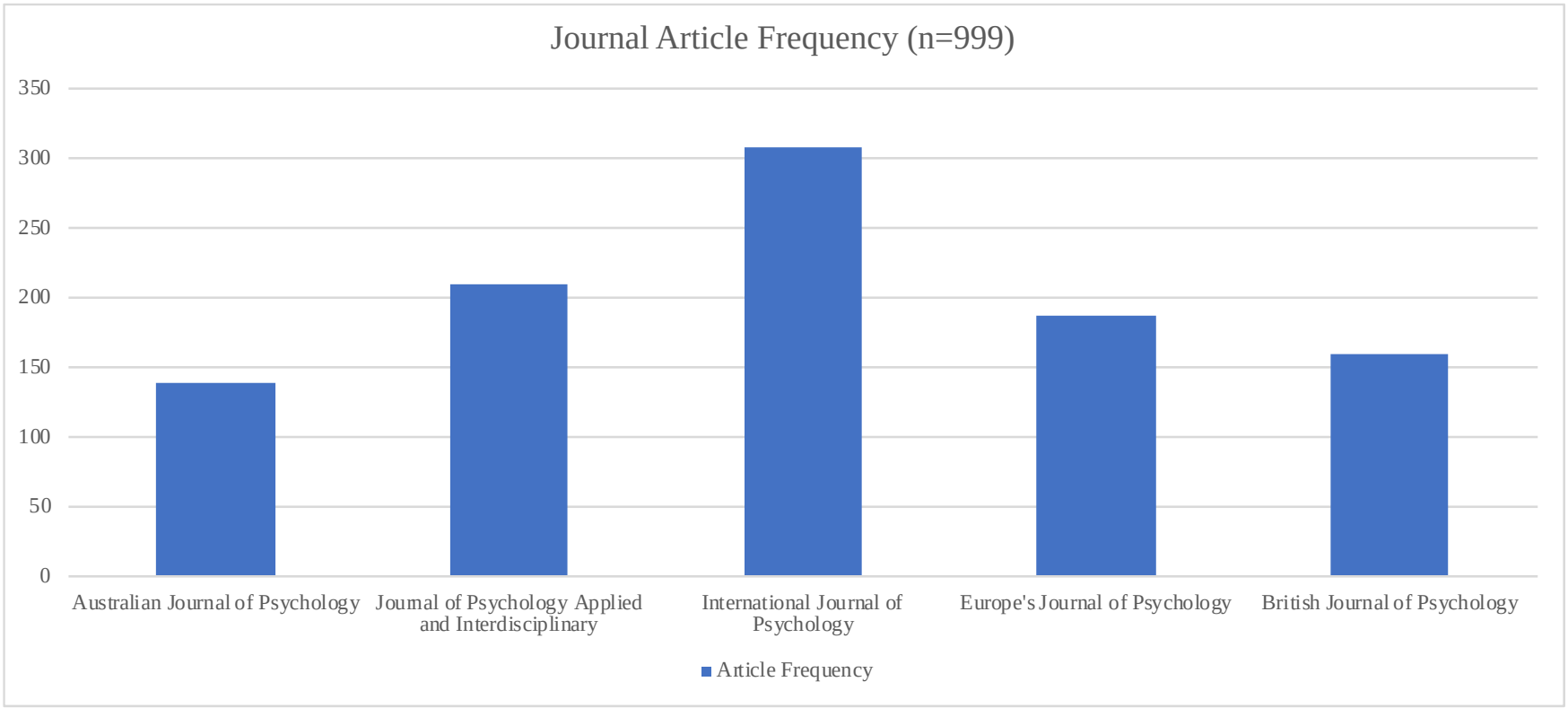


Figure 2. Topic frequency (international sample)

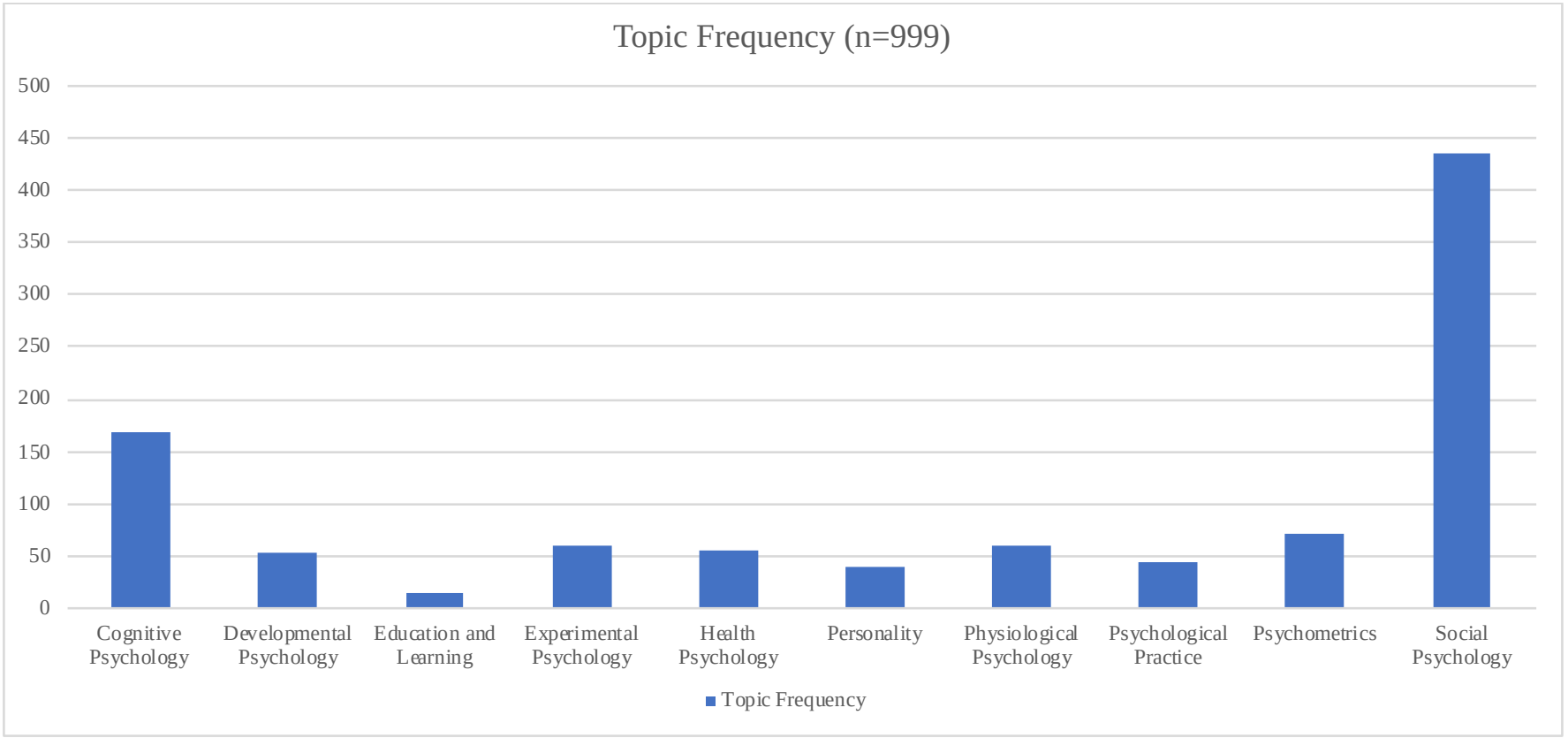


Figure 3. Research method frequency in topics in

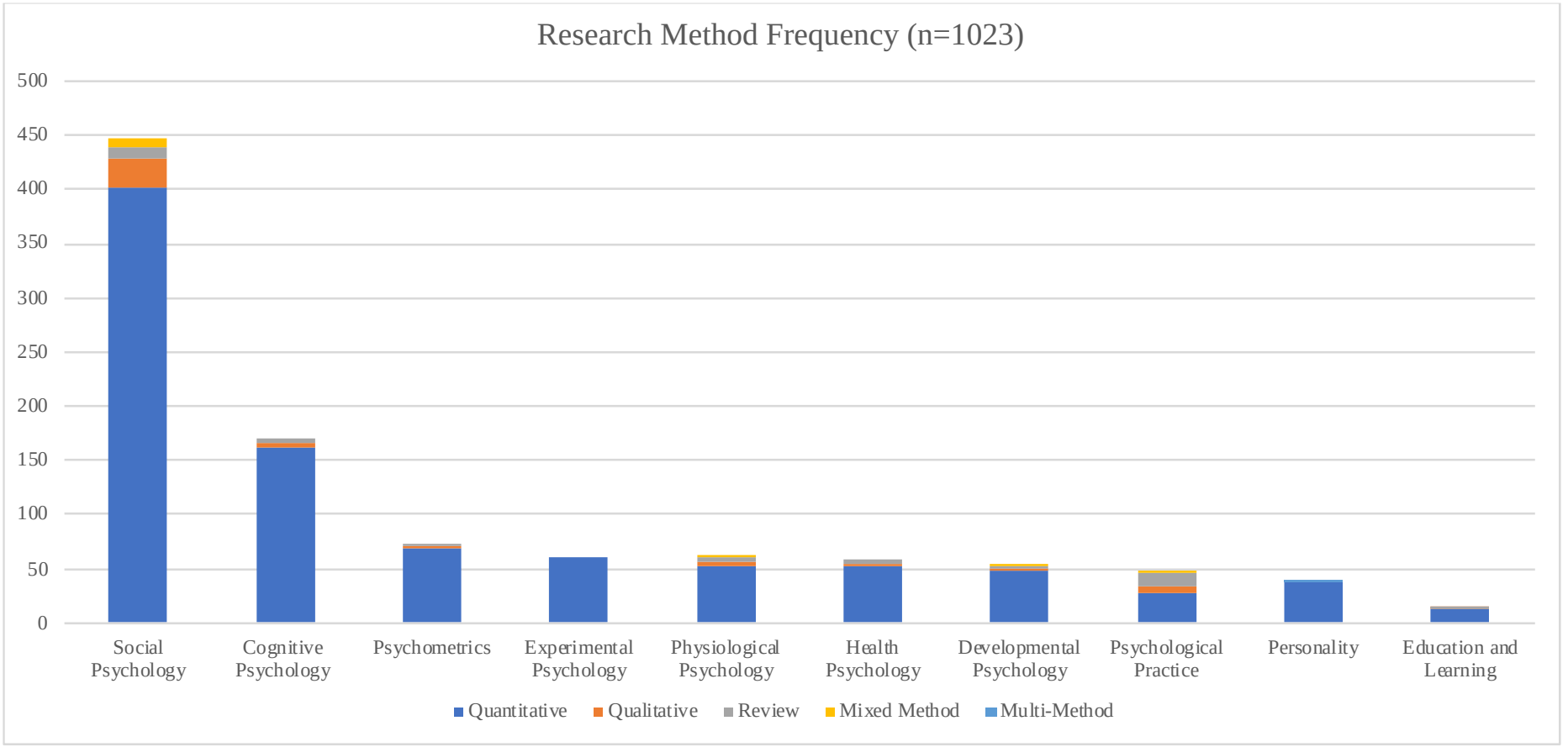


Figure 4. Sampling method frequency in topics

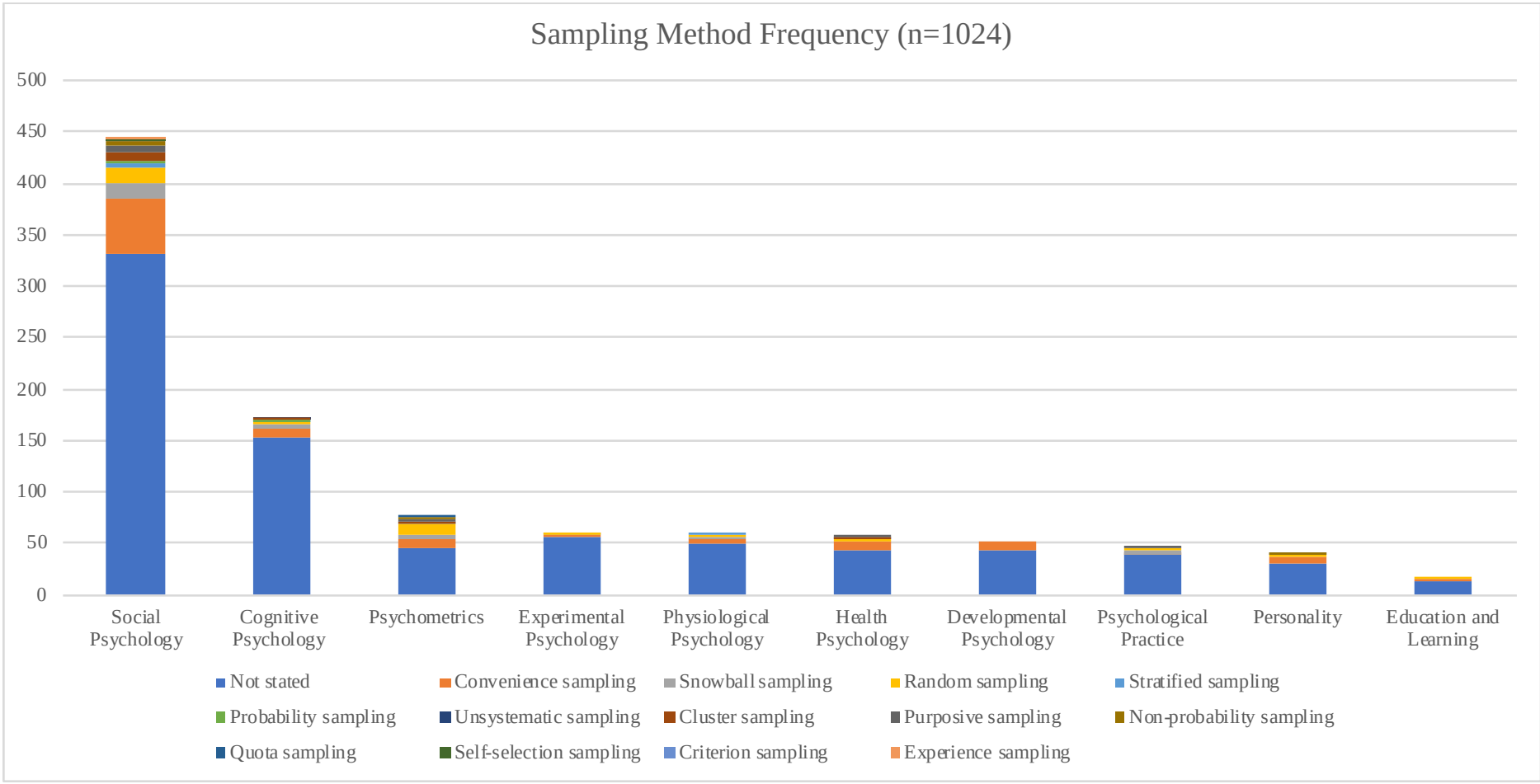


Figure 5. Design frequency in topics

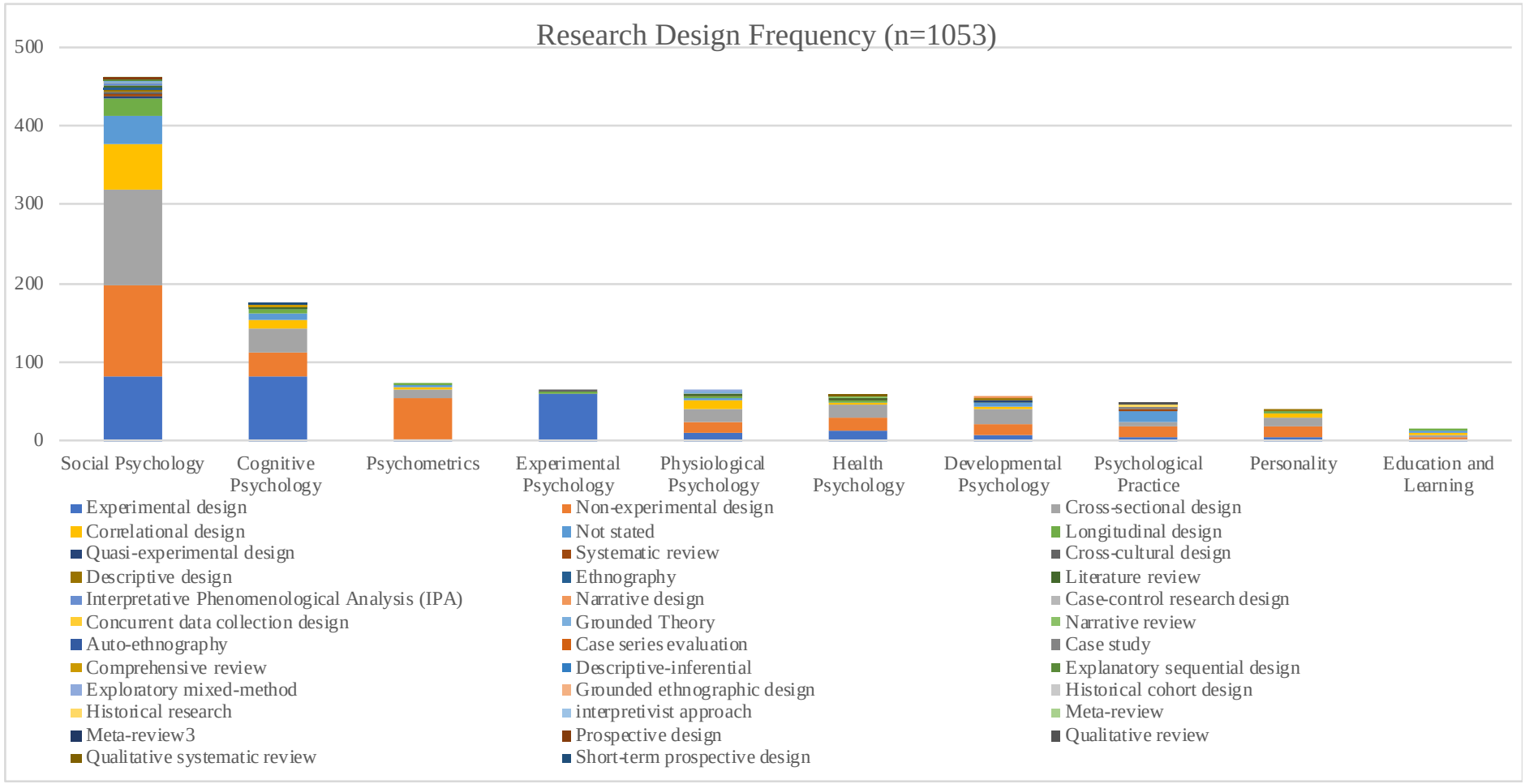


Figure 6. Data collection frequency in topics

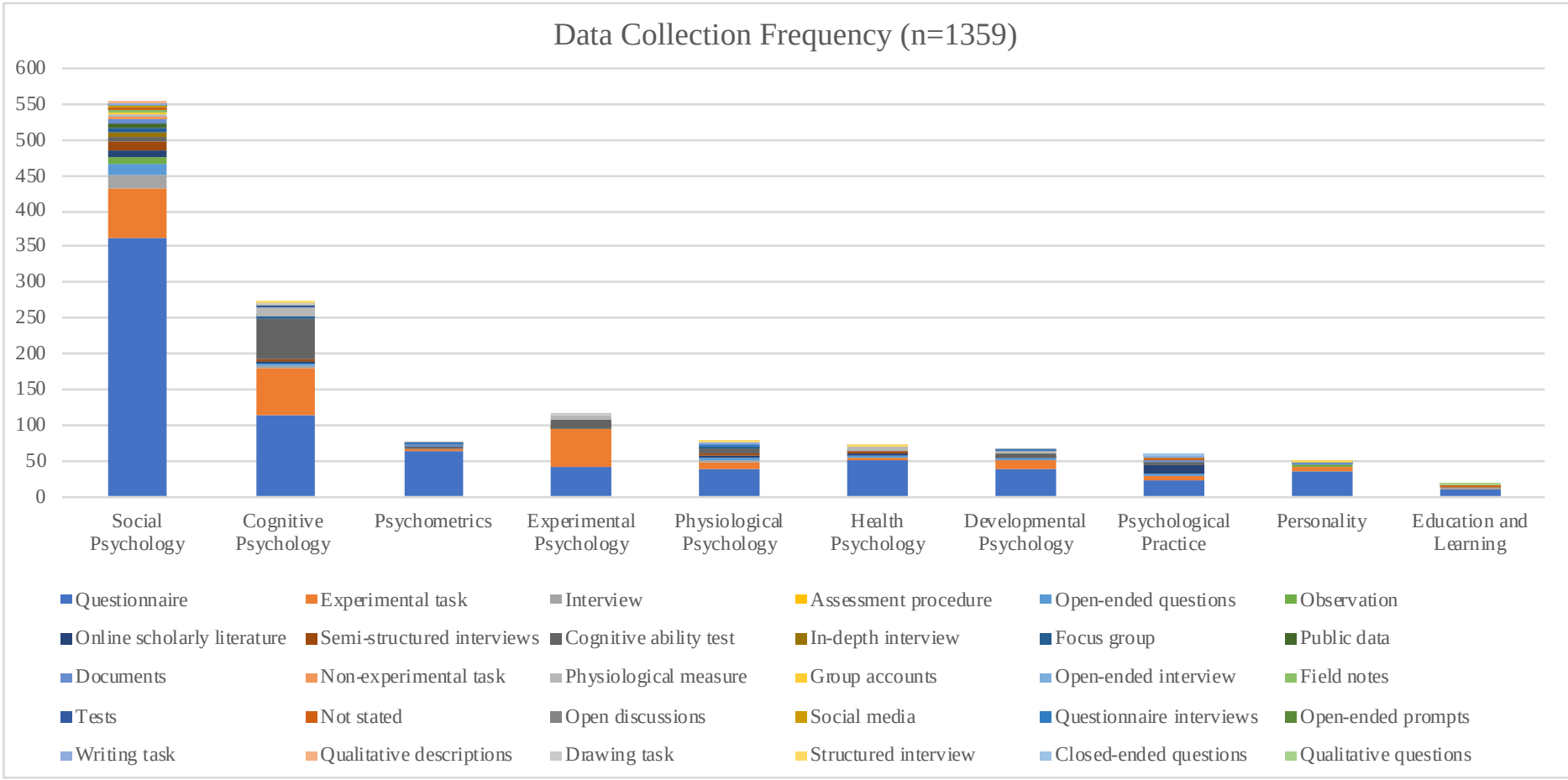


Figure 7. Data analysis for Social psychology topic

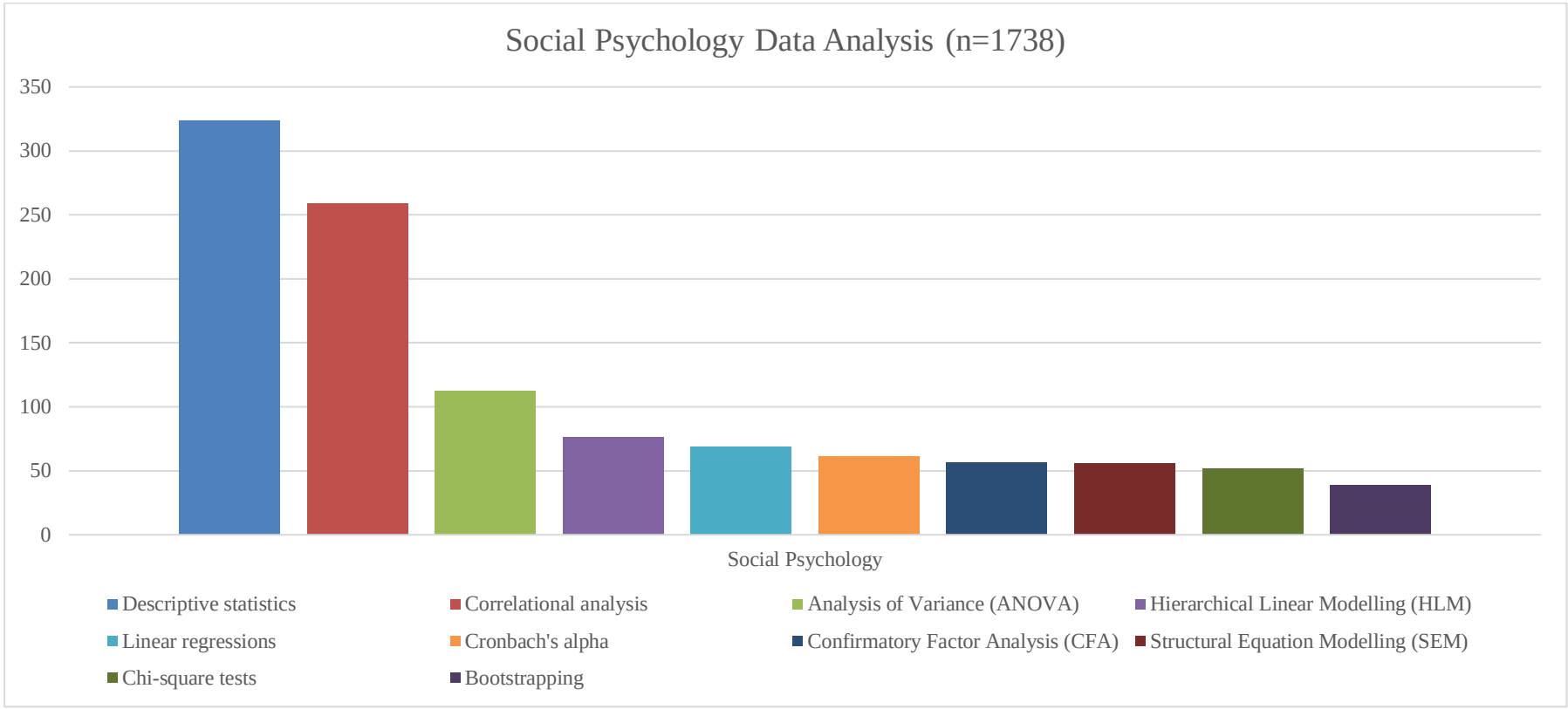


Figure 8. Data analysis for Cognitive Psychology topic

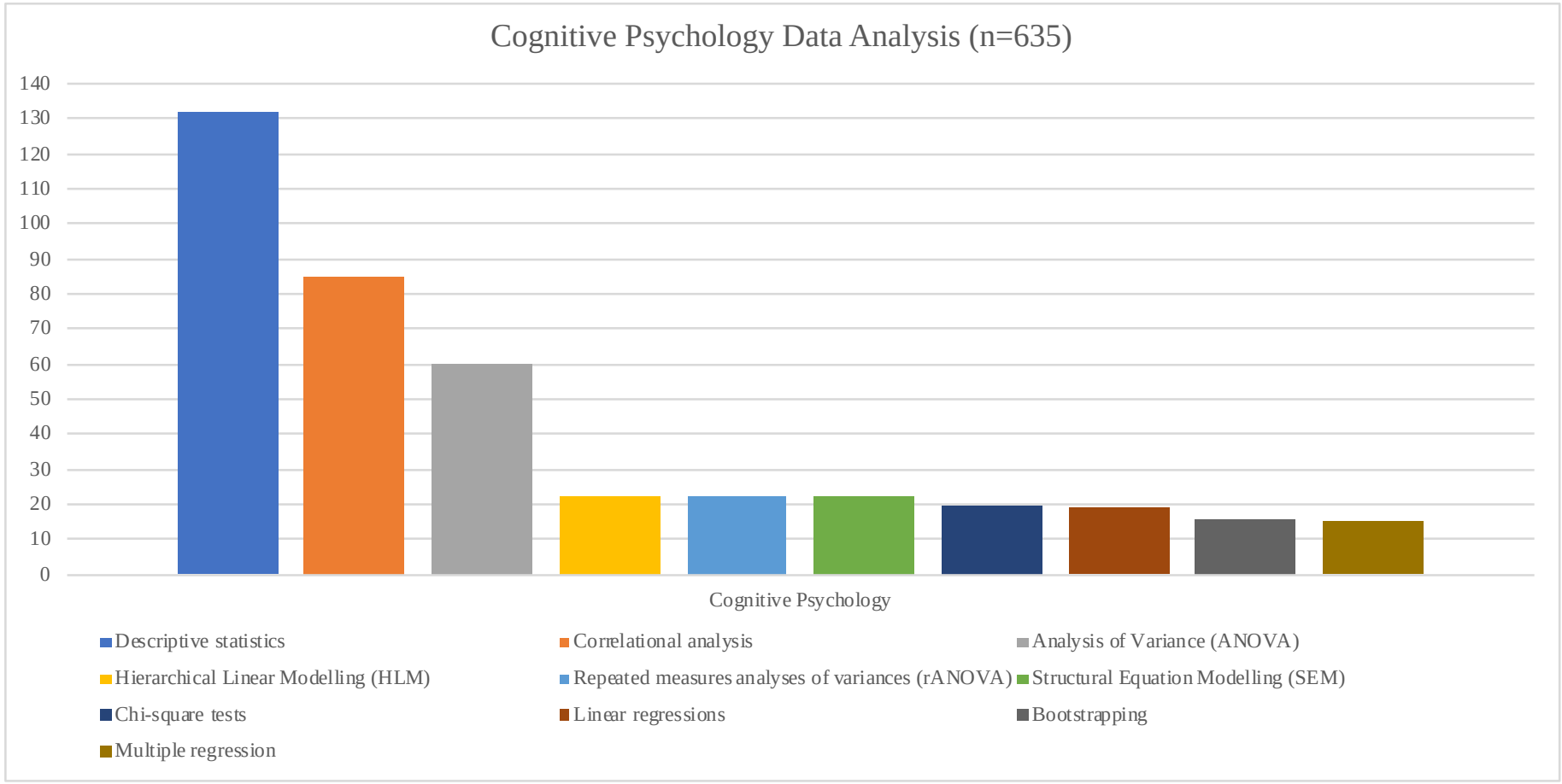


Figure 9. Data analysis for Psychometrics

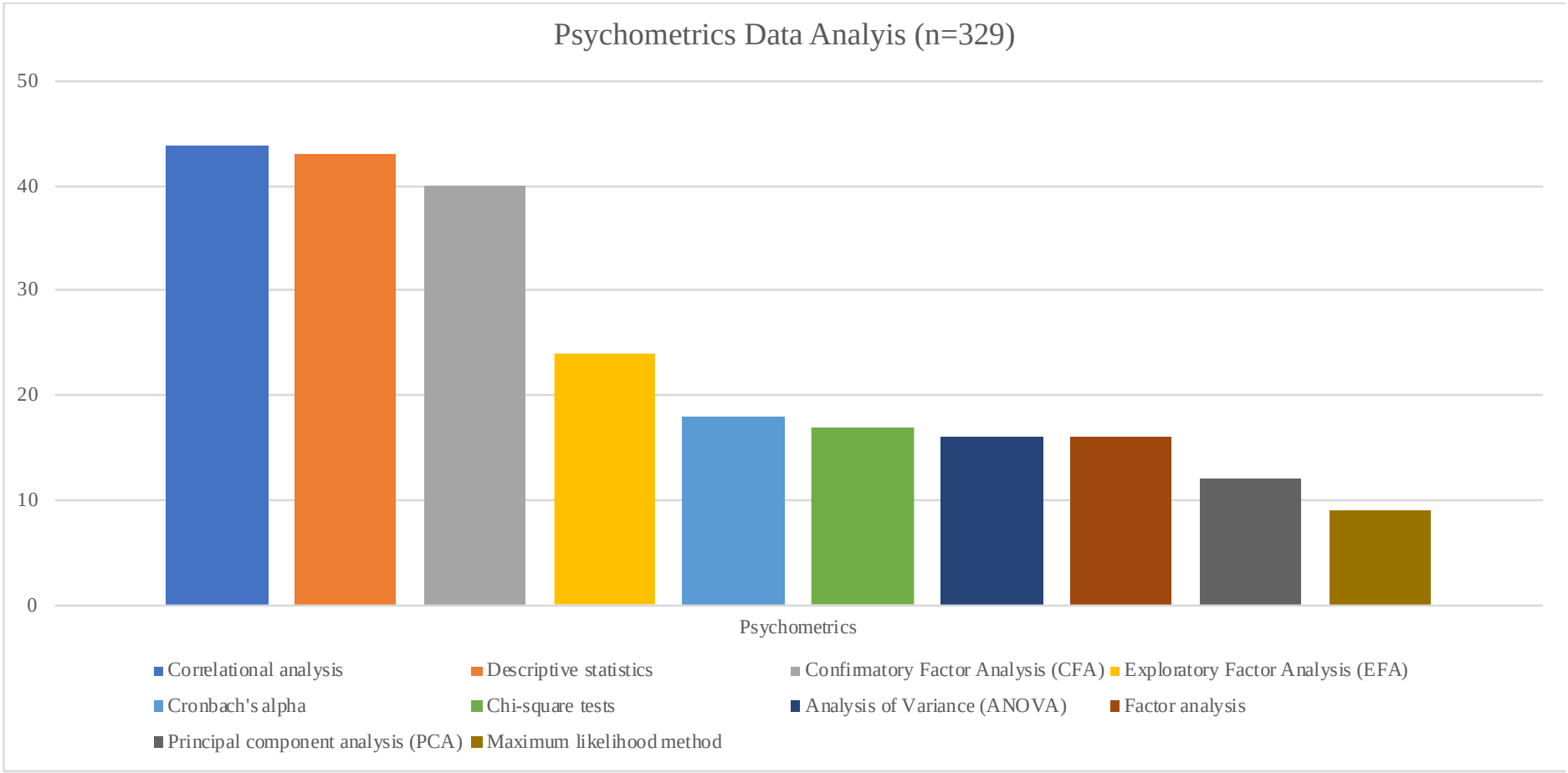


Figure 10. Data analysis for Experimental Psychology

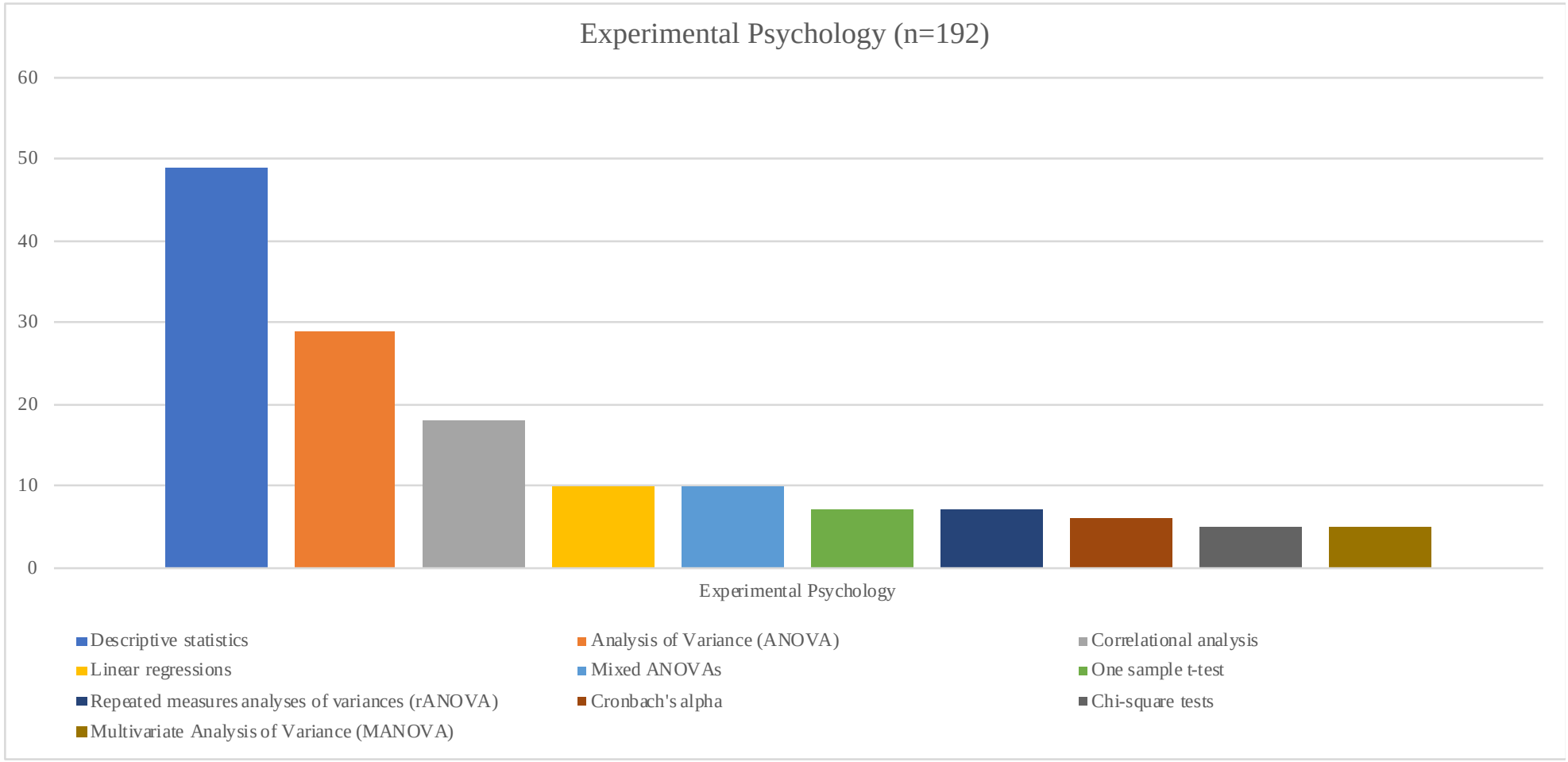


Figure 11. Data analysis for Physiological Psychology topic

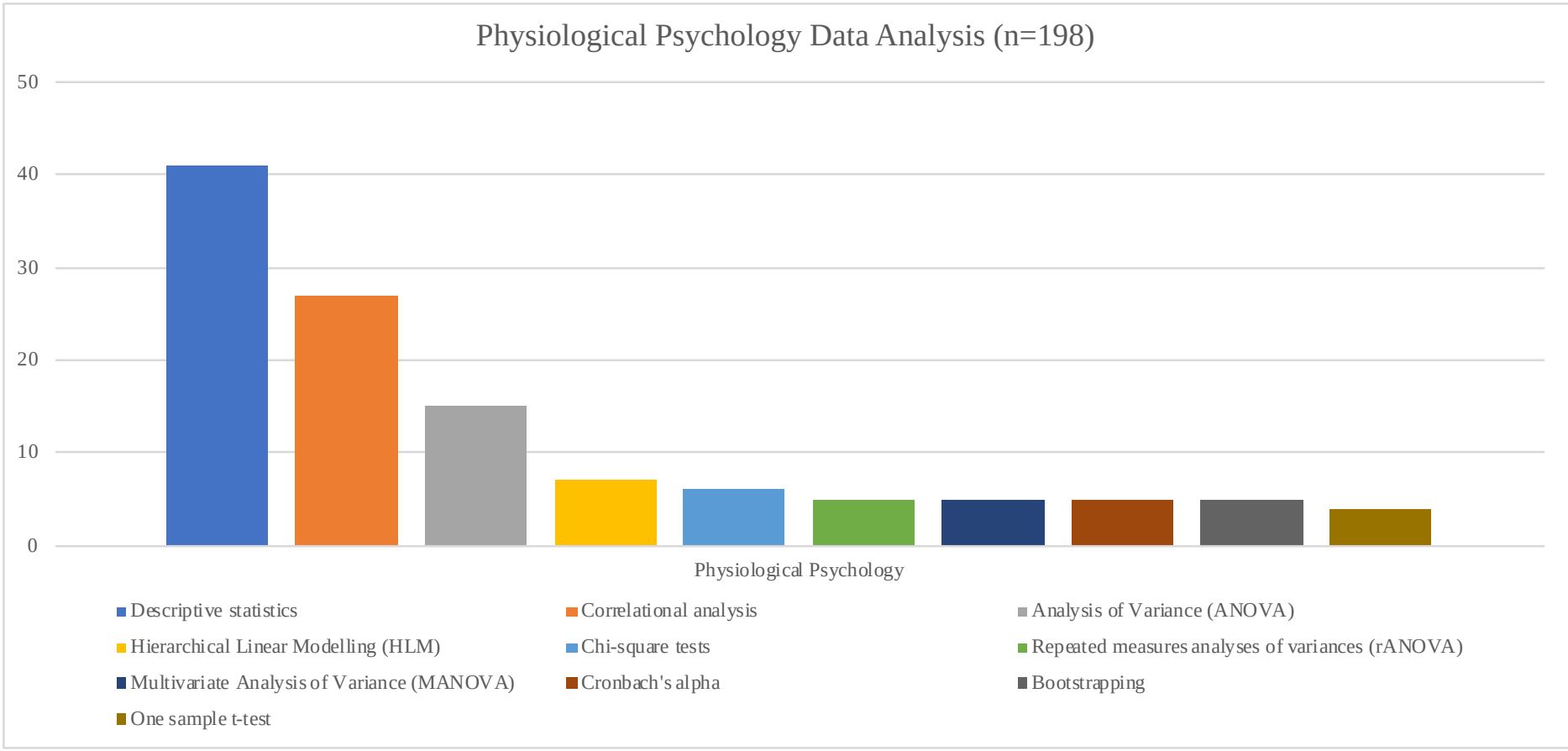


Figure 12**.** Data collection for Health Psychology Topic

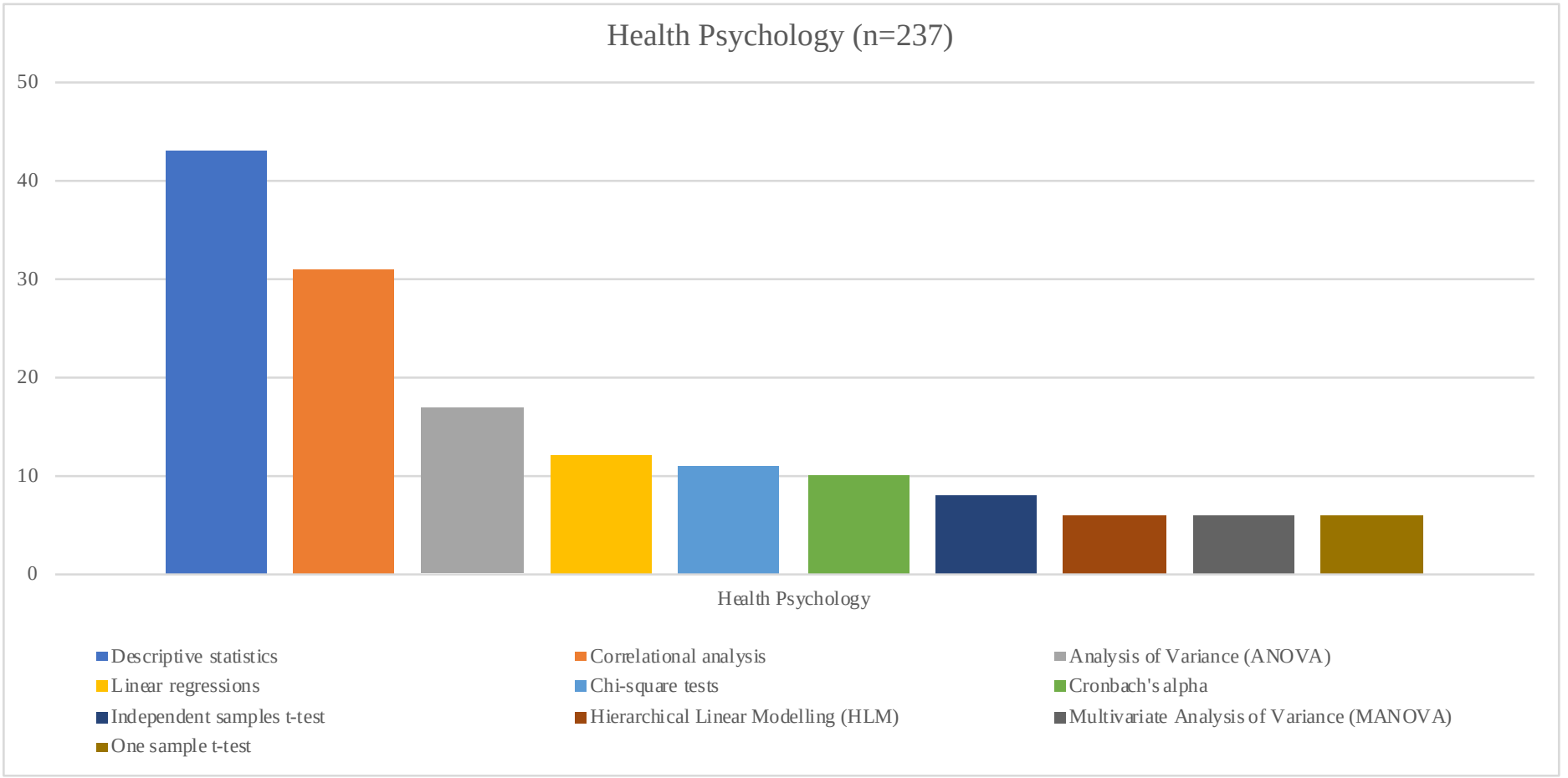


Figure 13**.** Data analysis for Developmental Psychology topic

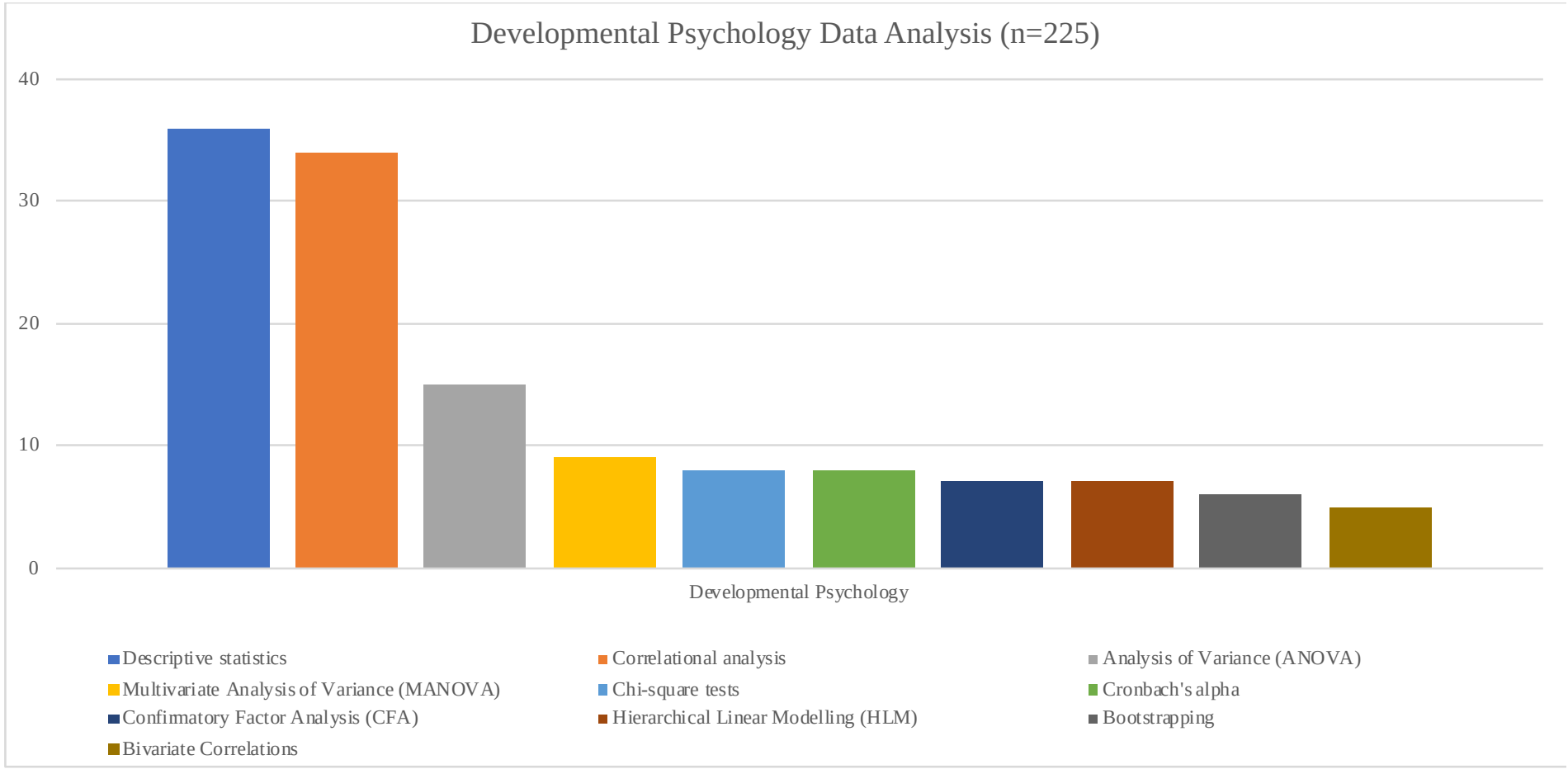


Figure 14. Data analysis for Psychological Practice topic

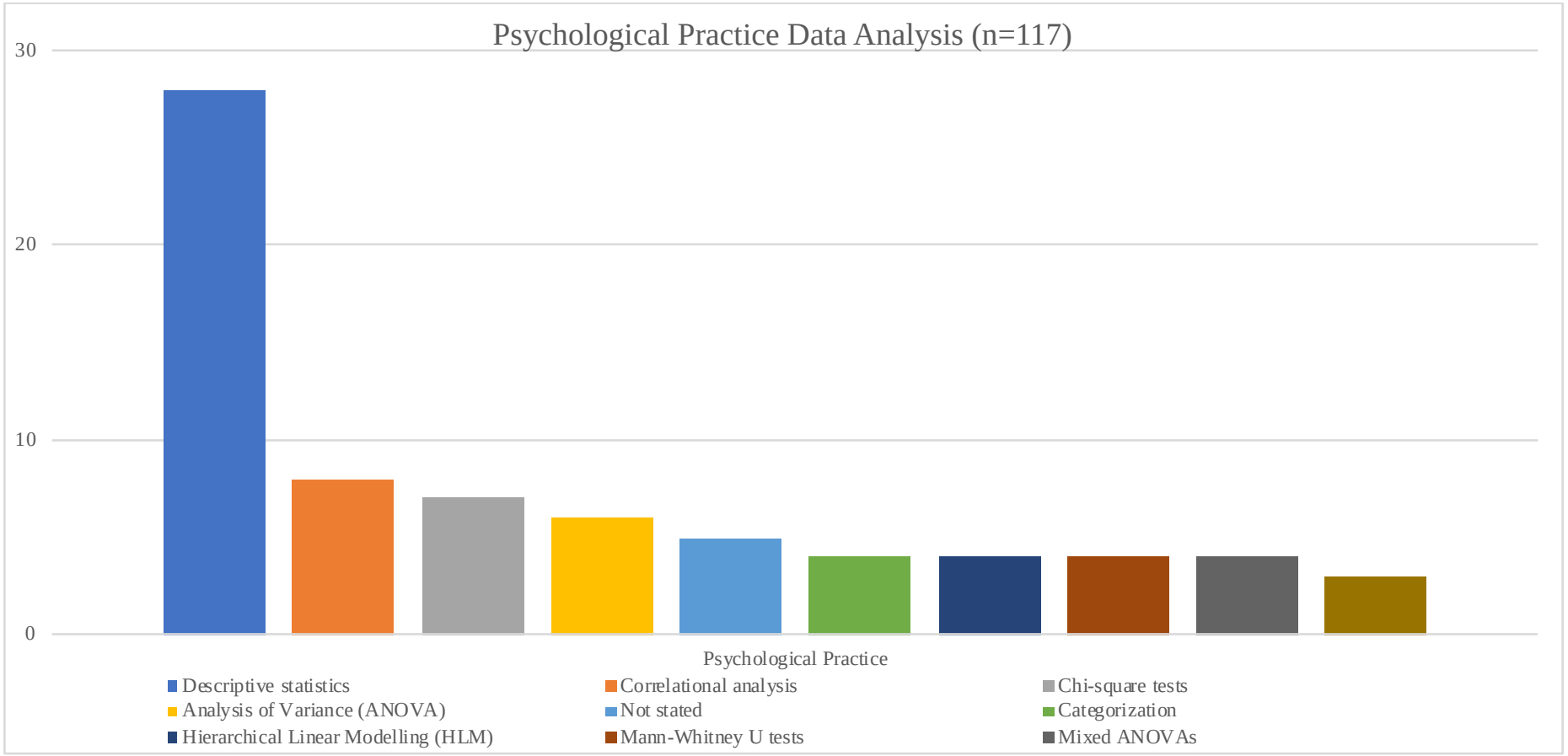


Figure 15. Data analysis for Personality topic

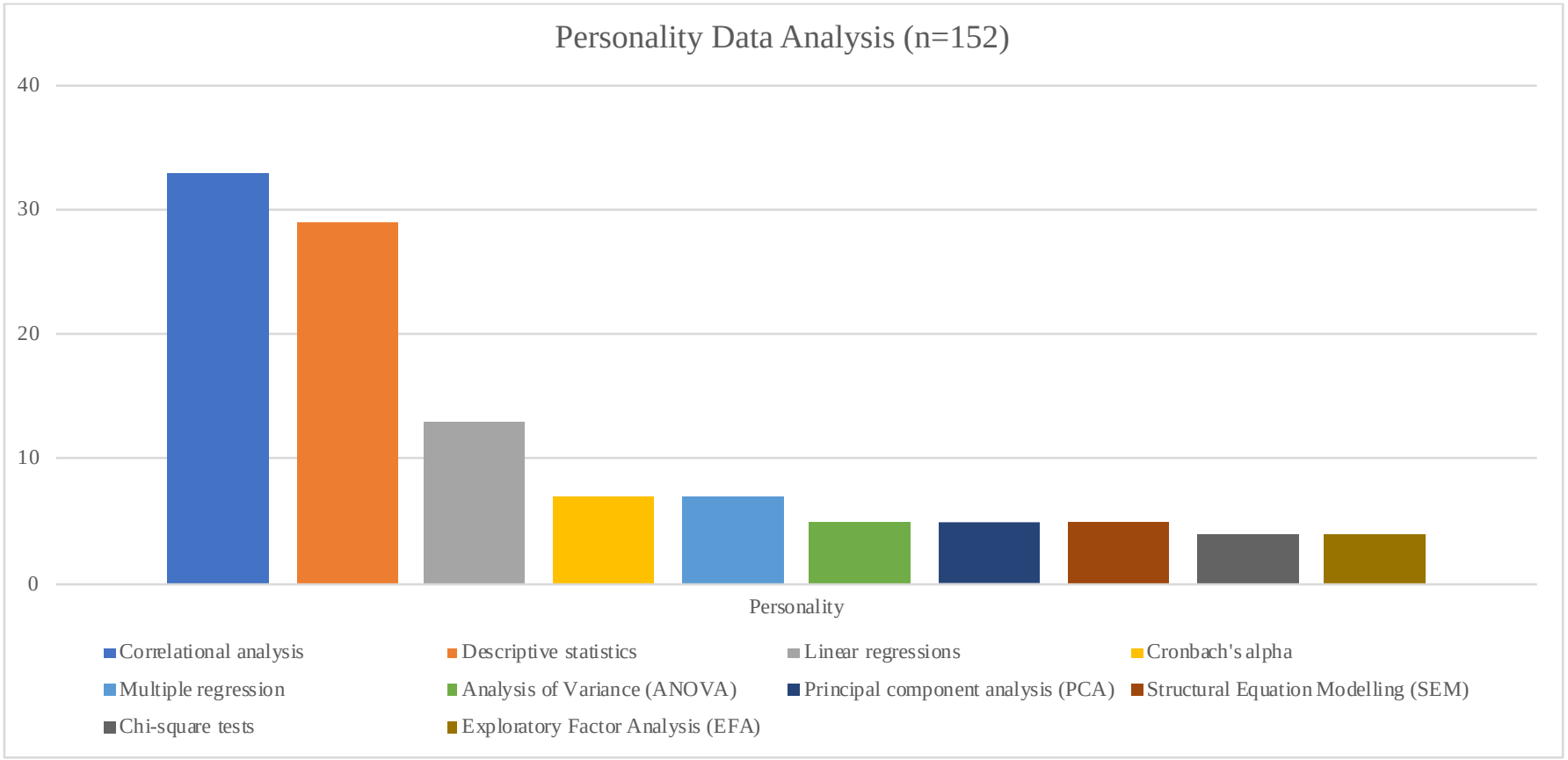
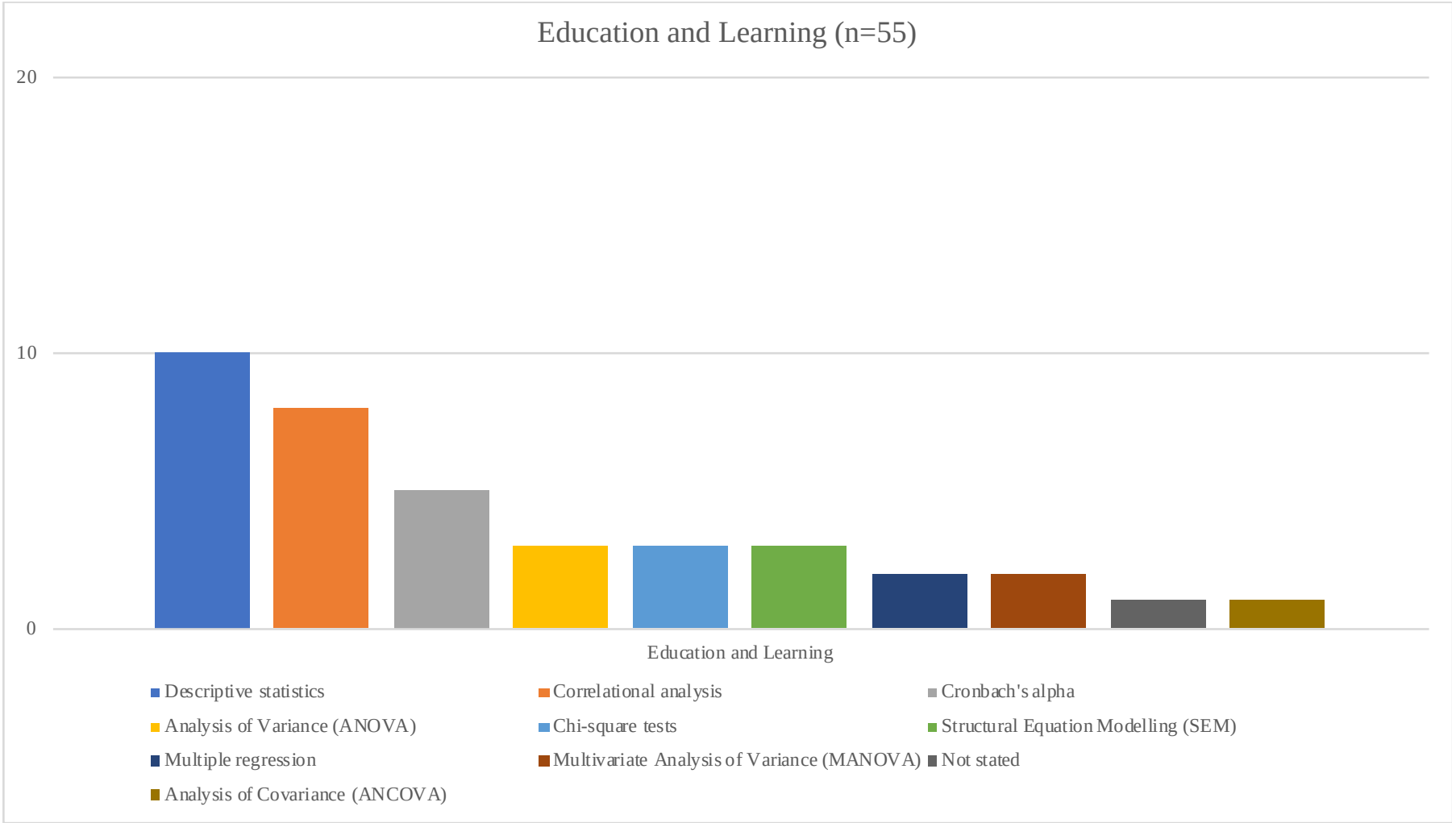


Figure 16. Data analysis for Education and Learning topic



CHAPTER 4 THE USE OF RESEARCH METHODS IN THE SOUTH AFRICAN JOURNAL OF PSYCHOLOGY (ARTICLE 2)

Article journal format: This article has been submitted to *The South African Journal of Psychology (SAJP)* (impact factor 0.782, word count: 5500, references according to APA 6th edition) and is currently under peer review for publication. Due to the word count restriction this article was submitted with table 1 and all the included figures. The remainder of the tables were made available to the editors of SAJP for possible publication and was therefore included in this article. According to SAGE author guidelines there is no need to follow a specific template for article submission as long as headings and sections are clear. However author guidelines (Thesis Appendix 2) stipulated by this journal have been applied except for margin size to keep the thesis uniform. Conflicts of interests, acknowledgement and funding sections were completed on the online submission platform and are therefore not included in this article.

The use of research methods in the South African Journal of Psychology

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Abstract

The use of research methods in a South African context was investigated. The South African Journal of Psychology (SAJP) was ranked highest on the SCimago Country Ranking system. Its focus on the field of psychology is comprehensive and it was therefore deemed appropriate to explore a sample for this investigation. A systematised review was used to discern what research methods are being used, how these methods are being used, and for what topics. As a result, 116 articles published in the South African Journal of Psychology between 2013 and 2017 were categorised. Results indicated the type of research methods used were mainly quantitative and qualitative methods. The remainder of the journal articles lacked transparency with regards to the used methodology, although the highest reported methods were included for this study These methods were typically applied to ten research topics, of which social psychology and psychological practice were the most popular, with education and learning the least investigated topic. The phenomena in the identified topics were largely addressed by means of questionnaires or interviews and samples of convenience.

Keywords: South African Journal of Psychology, research methods, research trends, research topics, psychological research, research approach

South African social science journals are ranked low on bibliometric evaluators, such as the 2010 Thomson Reuters' Journal Citation Reports® (Bornmann, Neuhaus, & Daniel, 2011) and the SCimago research country ranking (Scimago, 2017). These low rankings are due to our journals' low impact factors, and discourages submissions from international researchers to South African journals. Unfortunately, this could stop publication altogether or lower publication standards (Pouris & Pouris, 2015). Debates on the reasons for these low impact factors vary (see Kramer, Fynn, & Laher, 2019; Macleod & Howell, 2013).

Beyond these debates, however, Ketchen, Boyd and Bergh (2008) identify credible methodological practices as key to promoting academic publishing. Ezeh et al. (2010) highlight the need for global applied research skills in Africa. High research consumer demands for research from unknown empirical terrains (Nind, Kilburn, & Luff, 2015) as well as the unique sociocultural and socioeconomic differences in the South African population, along with its history of *apartheid* (Kramer et al. 2019) highlights the importance of promoting sound competence in the application of research methods. Additionally, publications fund South African universities via government subsidies (Pouris & Pouris, 2015), and research plays an imperative role in various aspects of a country's development (Fonn, 2005). This may include the development of policies for social or health interventions (Ezeh et al., 2010), cultivating human and intellectual capital (Frantz et al., 2014), and addressing social issues plaguing societies. Many of these issues are results of psychological questions (Walton & Dweck, 2009) and can be addressed by psychological solutions (Cooper & Nicholas, 2012). Due to the importance of research and the role of research methodology in improving research quality, and the contribution of psychological research to a country's wellbeing, the general aim of this study was t*o determine the use of research methods published in the South African Journal of Psychology*.

This journal was chosen to gain insight into the use of research methods, as it is ranked highest on the SCimago Journal Ranking list of the South African Miscellaneous journals, thus providing information on an extensive range of topics in this field. In addition, previous studies (see Macleod & Howell, 2013; O'Neil & Koekemoer, 2016) have also used this journal to investigate the application of research methods in South Africa, although not to the extent of the current study. The SAJP provides a basis to track the development and trends of research in this field over time by comparing similar elements addressed in previous studies.

The research aim was addressed by determining *what research methods are being used, how these methods are being used, and for what topics*. Macleod and Howell (2013) have explored the general state of the field of psychological research in South Africa. Their study of five and a half years focused on "what kinds of knowledge are being generated in published research in South African Psychology and how does this relate to social issues and the 'relevance' of South African Psychology?" (p. 225). In contrast to Macleod and Howell (2013), the current study is an in-depth exploration of the reality of published research topics and the research methodology that is used to address them. This aim concurs with a study by Scholtz, De Klerk and De Beer. (2019), who addressed a similar aim with a sample of top ranked international journals, and therefore provided a valuable basis for comparison in terms of the use of research methodology in a South African perspective.

The relationship between international psychology and that of South Africa is over a 100 years old, and the field has reached maturity (Cooper & Nicholas, 2012). The examination of a field's publications at different points in time could provide research stakeholders (editors, researchers and academia) the opportunity to see the development and future of a discipline (Bush & Grant, 1994). Additionally, the synthesis of journal content allows authors the opportunity to see changes in future applications of methodology or research trends

(Jordaan, Wiese, Amade, & Clercq, 2013), and journal editors could identify opportunities for special editions (Phelan, Ferreira, & Salvador, 2002).

This single sample review can be considered a current research discourse or representation of societal needs, which could contribute to both the academic and the general population (Bittermann & Fischer, 2018). Additionally, the information provided by this review could highlight the uniqueness of conducting psychology research in South Africa as well as areas of methodological development that could be addressed to improve our publication rates and research impact.

Method

Sample

As per this the systematised review design only one to two databases are consulted (Grant & Booth, 2009) using a purposive sample (Ritchie, Lewis, & Elam, 2009) of 116 articles published between 2013 and 2017 by the South African Journal of Psychology (SAJP) was scrutinised for this study. The SAJP includes a wide-ranging collection of psychology topics (SAGE Journals, 2019) and was the highest ranked miscellaneous African psychology journal on the Scimago Journal & Country Ranking (SCImago Journal & Country Rank, 2017). Additionally, the aim of this article corresponds with the aim of the SAJP, which is to advance psychology in South Africa as psychological praxis and a science (Cooper & Nicholas, 2012). Therefore, this journal was deemed an applicable source for determining the use of research methods in South Africa. Only empirical and review articles were included, as these articles included the aspects addressed by the research questions.

Instruments

This study was conducted by means of a systematised review design, which (Grant and Booth (2009) define as a review that includes some aspects of a systematic review design, which

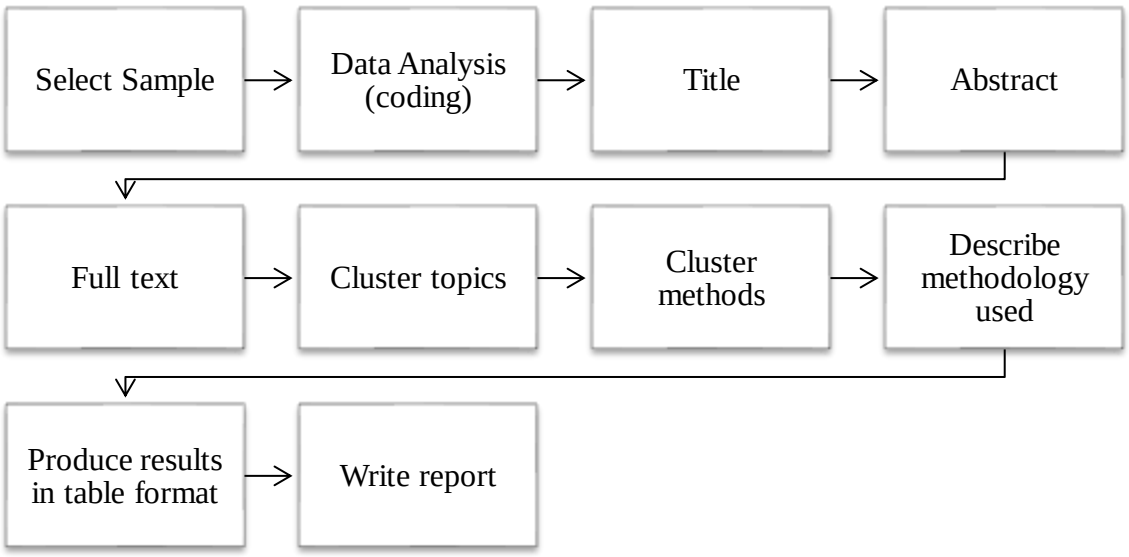
produces results in a tabular form. The main aim of this design was to categorise data (Grant & Booth, 2009), thus avoiding any evaluation or criticism of the value of the articles.

Procedure

This study commenced as soon as ethical approval and clearance had been received. The second and third author ensured that all ethical procedures were adhered to throughout the study. Due to a lack of clear procedure for the systematised review design, the authors followed that of previously published works by Ferreira, Bessa, Drezett and De Abreu (2016) as well as that of Scholtz et al. (2019) (Figure 1). Articles were collected and systematically coded (Grant & Booth, 2009) by the first author and co-coded by an independent person. Codes were created based on the wording of the articles and clustered into themes. Microsoft Excel worksheets were used to manually categorise the articles according to the identified structure, namely: *research topic*, *sampling*, *data collection* and *data analysis*, along with article identifiers such as author names, titles and research aims.

Figure 1

Systematised review procedure



Ethical considerations

The ethical clearance number of the study is NWU-00115-17-S1 and it adhered to regulations identified by the Health Professions Council of South Africa (Department of Health, 2011).

Rigour

As this systematised review incorporates aspects of a systematic review, such as a comprehensive literature search that is presented in a tabular form (Grant & Booth, 2009), the application thereof should be discussed to ensure rigour.

Firstly, the research process, as indicated in Figure 1, was approved by the researchers involved in this study, as well as three groups of stakeholders/research committee members (Johnston, Kelly, Hsieh, Skidmore, & Wells, 2019). A rigorous literature search of this study was ensured by presenting all steps followed in the collection process, thereby promoting transparency (Johnston et al., 2019). Microsoft Excel spreadsheets were also used to categorise the articles, thereby creating an evidence trail for the selection of articles in accordance with the research question and determined sampling criteria (Johnston et al., 2019; Bandara, Furtmueller, Gorbacheva, Miskon, & Beekhuyzen, 2015). Categorisation of data was also in line with the research question (Johnston et al., 2019). An independent person was used to corroborate the data collected by the first reviewer, thereby ensuring rigorous data extraction (Johnston et al., 2019). Data was synthesised in a tabular form in accordance with the review design and research question/aim (Johnston et al., 2019).

Data analysis

Data for this systematised review was analysed by categorising the collected articles according to the following headings by identifying themes derived from codes: *research topic, sampling, method, design, data collection* and *data analysis*. The following defining aspects were used as reference to develop codes:

- A *topic* refers to fields of a scientific discourse and could reflect the needs of the chosen population (Bittermann & Fischer, 2018).
- *Sampling* indicates the technique used to select participants from a population to participate in research (Maree & Pietersen, 2016; Ritchie et al., 2009).
- *Method* refers to the specific tool a researcher employs to gather data (Nieuwenhuis, 2016).
- The method is typically connected to the *design*, and allows the researcher to draw conclusions from the variables or phenomenon of interest by arranging conditions in a specific manner (Mash & Wolfe, 2010).
- Lastly, *data collection* and *data analysis* are utilised for revealing information through the examination of data (Kte'pi, 2016).

Results

A total of 238 articles were published in the SAJP between 2013 and 2017. Based on the identified inclusion criteria, 116 articles were included and categorised. It is important to note that the results were based on what authors stated in their articles; thus, it is possible that certain aspects, such as data analysis techniques, were applied but not explicitly stated by the authors. These results should therefore be seen as a broad estimate of the use of research methods.

A general overview of the results is presented in accordance with the aim of the study, with specific application of the research methodology for each identified research topic indicated in table format. Percentages are given to the second decimal point as a way to indicate small differences in the frequency of results. These percentages were also calculated according to the frequencies in each category and not the total articles, as many articles utilised more than one methodology (for example, two methods in one article).

The research topics were identified by means of ten themes derived from the full-text article codes from co-coding. Of these ten themes, nine were found to be similar to the research fields identified by Weiten (2010). Therefore, Weiten's definitions were applied to create broad identifying definitions of these topics. This sample of articles also yielded an additional field of research, named psychological practice, which was added to the fields of research identified by Weiten (2010). This categorisation also allowed for comparison of results with Scholtz et al. (2019):

Table 1

Research fields according to Weiten (2010)

Research Topic	**Definition**
Social Psychology	Behaviour is piloted by social drivers
Psychometrics	Measures of capacity or behaviour
Health Psychology	Psychological factors' impact of physiological health
Cognitive Psychology	Higher mental process studies
Physiological Psychology	Physiological factors' impact of Psychological health
Developmental Psychology	Research over entire human lifespan with regards to development
Experimental Psychology	Includes traditional core psychology topics. (Not the only topic that includes experimental research)
Personality	Consistency in human behaviour is researched
Education and Learning	Focuses on the most efficient way to teach and how people learn

The methodology that was followed for these topics were further categorised according to *method, sampling, design, data collection* and *data analysis*. This categorisation was based on the articles' identification thereof and not the researchers' inference.

Herewith the results for *what methods are being used, how these methods are being used, and for which topics* in the South African Journal of Psychology.

Methods. Quantitative research was found to be the most popular research method, constituting 52.38% of the reported research methods. Qualitative research followed at 33.33%, making it the second most popular research method. Reviews and mixed method studies were utilised at an equal rate of 12.70%, with no multi-method studies being reported in this sample. Please see Figure 2 and Table 2 for the frequency of each method within the identified themes.

Figure 2

Method frequency in research topics in the South African Journal of Psychology

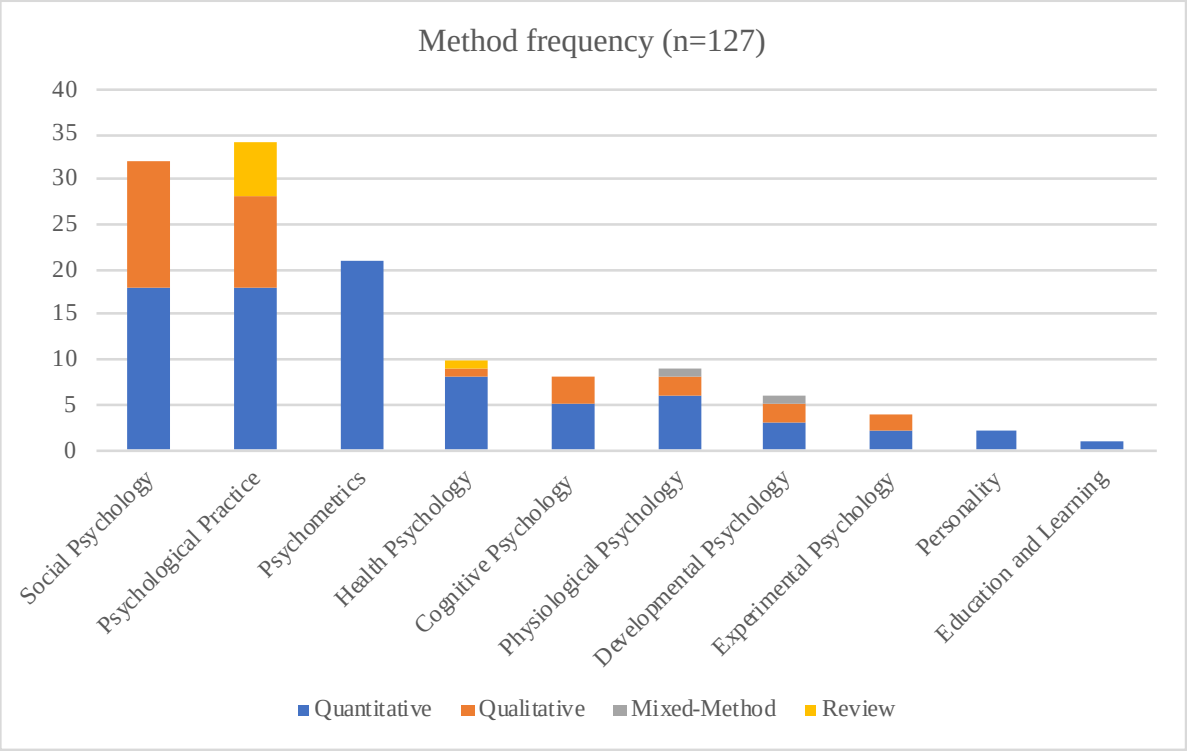


Table 2

Method use in the South African Journal of Psychology

Research method	Social Psychology	Psychological Practice	Psychometrics	Health Psychology	Cognitive psychology	Physiological Psychology	Developmental Psychology	Experimental Psychology	Personality	Education and Learning
Mixed Methods	0	0	0	0	0	1	1	0	0	0
Multi-method	0	0	0	0	0	0	0	0	0	0
Qualitative	14	18	0	1	3	2	2	2	0	0
Quantitative	18	10	21	8	5	6	3	2	2	1
Review	0	6	0	1	0	0	0	0	0	0
Total	**32**	**34**	**21**	**10**	**8**	**9**	**6**	**4**	**2**	**1**

Sampling. Results indicate the use of 11 types of sampling methods, of which a "not stated" method was also created due to the large number of studies that did not state their sampling method (31.0%). The most stated sampling method was convenience sampling (26.0%), followed by purposive sampling (19.0%), and a general reference to samples consisting of non-probability sampling (8.0%). Random (6.0%) and snowball sampling (5.0%) also occurred, with the remainder of the sampling methods constituting between 1.0 and 5.0% of the identified sampling methods. Figure 3 and Table 3 presents the frequency of each sampling method in each research topic.

Figure 3

Sampling method per research topic in the South African Journal of Psychology

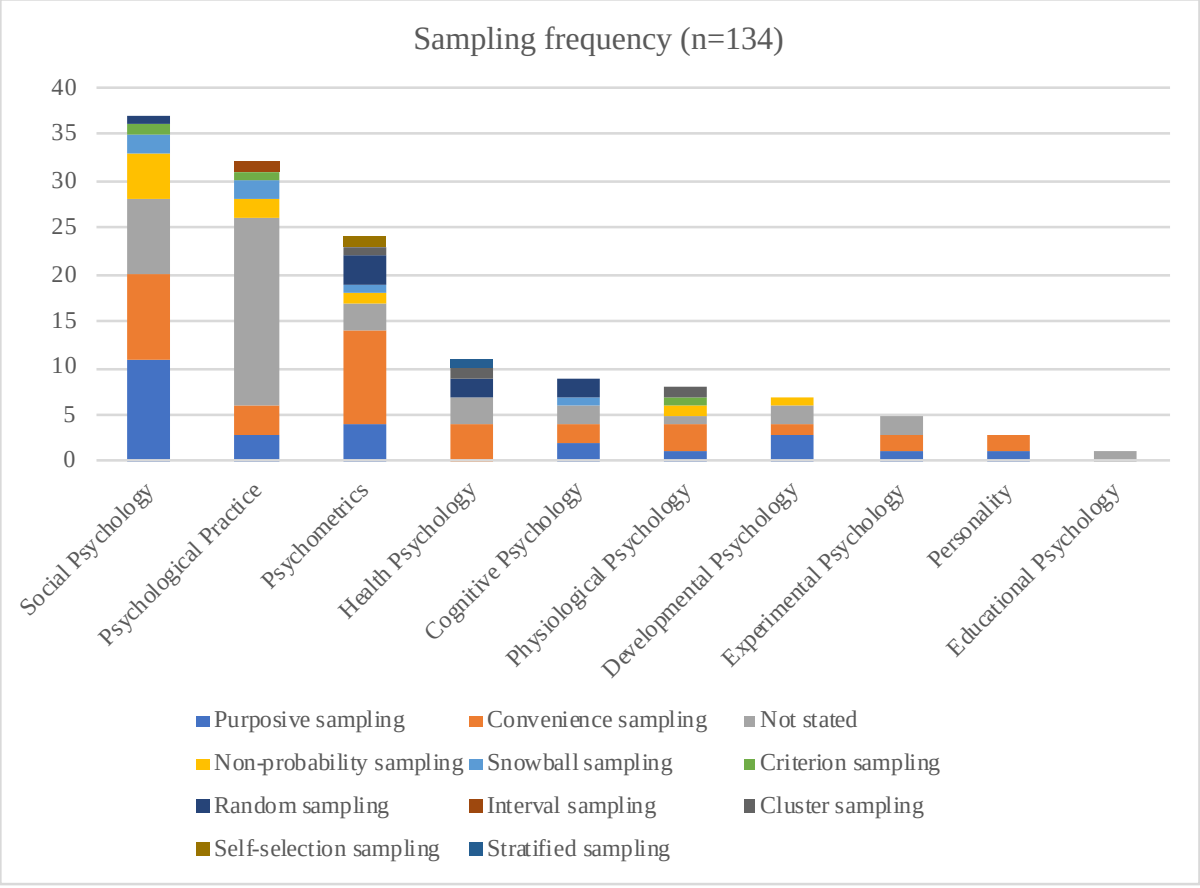


Table 3

Sampling methods in the South African Journal of Psychology

Sampling method	Social Psychology	Psychological Practice	Psychometrics	Health Psychology	Cognitive psychology	Physiological Psychology	Developmental Psychology	Experimental Psychology	Personality	Education and Learning
Not stated	8	20	3	3	2	1	2	2	0	0
Cluster sampling	0	0	1	1	0	1	0	0	0	0
Convenience sampling	9	3	10	4	2	3	1	0	2	0
Criterion sampling	1	1	0	0	0	1	0	0	0	0
Interval sampling	0	1	0	0	0	0	0	0	0	0
Non-probability sampling	5	2	1	0	0	1	1	0	0	0
Purposive sampling	11	3	4	0	2	1	3	0	1	0
Random sampling	1	0	3	2	2	0	0	0	0	0
Self-selection sampling	0	0	1	0	0	0	0	0	0	0
Snowball sampling	2	2	1	0	1	0	0	0	0	0
Stratified sampling	0	0	0	1	0	0	0	0	0	0
Total	**37**	**32**	**24**	**11**	**9**	**8**	**7**	**2**	**3**	**1**

Designs. The 21 designs addressed each specific topic as shown in Figure 4 and Table 4. It is important to note that, in the case of the non-experimental designs (23.0%), the authors assigned this categorisation to quantitative studies that did not indicate any use of an experiment or clearly stated design. It should therefore only be compared to experimental designs (1.0%) when considering the results. Similarly, a 'not stated' (21.0%) code was assigned to studies that followed the remainder of the research methods, for example qualitative research, but also omitted a research design.

Figure 4

Research design frequency per research topic in the South African Journal of Psychology

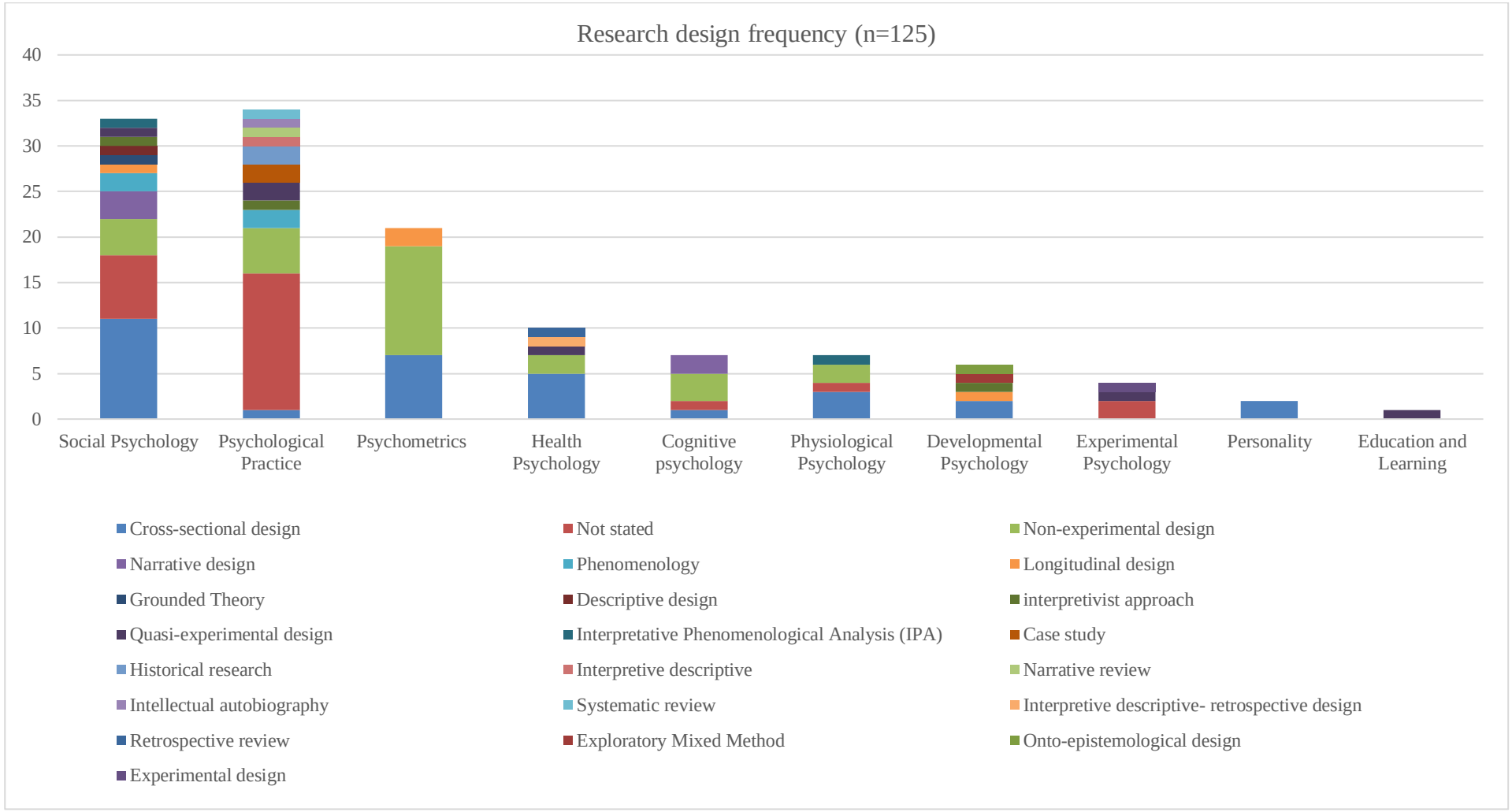


Table 4

Research designs in the South African Journal of Psychology

Design	Social Psychology	Psychological Practice	Psychometrics	Health Psychology	Cognitive psychology	Physiological Psychology	Developmental Psychology	Experimental Psychology	Personality	Education and Learning
Not stated	7	15	0	0	1	1	0	2	0	0
Case study	0	2	0	0	0	0	0	0	0	0
Cross-sectional design	11	1	7	5	1	3	2	0	2	0
Descriptive design	1	0	0	0	0	0	0	0	0	0
Experimental design	0	0	0	0	0	0	0	1	0	0
Exploratory mixed-method	0	0	0	0	0	0	1	0	0	0
Grounded Theory	1	0	0	0	0	0	0	0	0	0
Historical research	0	2	0	0	0	0	0	0	0	0
Intellectual autobiography	0	1	0	0	0	0	0	0	0	0
Interpretative Phenomenological Analysis (IPA)	1	0	0	0	0	1	0	0	0	0

Design	Social Psychology	Psychological Practice	Psychometrics	Health Psychology	Cognitive psychology	Physiological Psychology	Developmental Psychology	Experimental Psychology	Personality	Education and Learning
Interpretive descriptive	0	1	0	1	0	0	0	0	0	0
interpretivist approach	1	1	0	0	0	0	1	0	0	0
Longitudinal design	1	0	2	0	0	0	1	0	0	0
Narrative design	3	0	0	0	2	0	0	0	0	0
Narrative review	0	1	0	0	0	0	0	0	0	0
Non-experimental design	4	5	12	2	3	2	0	0	0	0
Onto-epistemological design	0	0	0	0	0	0	1	0	0	0
Phenomenology	2	2	0	0	0	0	0	0	0	0
Quasi-experimental design	1	2	0	1	0	0	0	1	0	0
Retrospective review	0	0	0	1	0	0	0	0	0	0
Systematic review	0	1	0	0	0	0	0	0	0	0
Total	**33**	**34**	**21**	**10**	**7**	**7**	**6**	**4**	**2**	**0**

Cross-sectional designs were the most popular research design (26.0%) followed by quasi-experimental designs (4.0%), which concurred with the large number of quantitative studies. Longitudinal designs constituted 4.0% of reported designs. For qualitative studies, the most reported designs included narrative designs (4.0%), phenomenological design (3.0%), and interpretative phenomenological analysis (IPA) (2.0%). Mixed-method studies clearly indicated the use of an exploratory mixed-method design, while reviews reported narrative, systematic, and retrospective designs each accounting for 1.0% of the reported designs. The remainder of the different types of designs also ranged from 1.0 – 2.0%.

Data collection and analysis. Twenty-three data collection methods were reported in the sample, of which almost half of the data collection frequency were made up of questionnaires (43.29%). Various types of interviews jointly accounted for 28.66% of the collection methods and consisted of interviews and interview questions such as semi-structured interviews and open-ended questions. This can be seen in Figure 5 and Table 5 along with the remainder of the data-collection methods. Using documents (6.71%) as a form of data collection was also popular, along with focus groups (3.05%).

Figure 5

Data collection per research topic in the South African Journal of Psychology

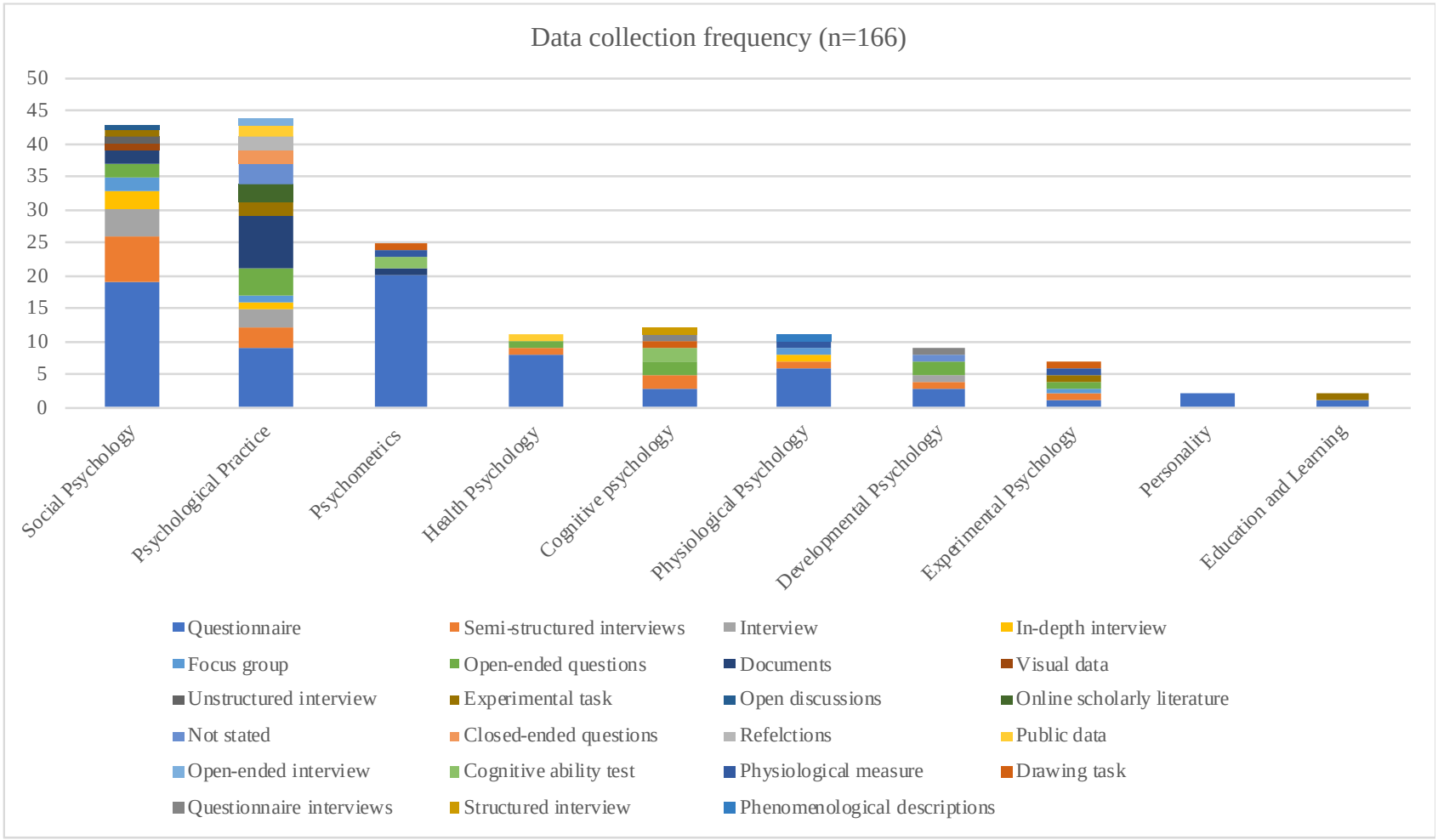


Table 5

Data collection methods in the South African Journal of Psychology

Data collection	Social Psychology	Psychological Practice	Psychometrics	Health Psychology	Cognitive psychology	Physiological Psychology	Developmental Psychology	Experimental Psychology	Personality	Education and Learning
Questionnaire	19	9	20	8	3	6	3	1	2	1
Semi-structured interviews	7	3	0	1	2	0	1	1	0	0
Documents	2	8	1	0	0	0	0	0	0	0
Open-ended questions	2	4	0	1	2	0	0	1	0	0
Interview	4	3	0	0	0	0	1	0	0	0
Experimental task	1	2	0	0	0	0	0	1	0	1
Focus group	2	1	0	0	0	1	0	1	0	0
In-depth interview	3	1	0	0	0	1	0	0	0	0
Cognitive ability test	0	0	2	0	2	0	0	0	0	0
Not stated	0	3	0	0	0	0	1	0	0	0
Drawing task	0	0	1	0	1	0	0	1	0	0
Online scholarly literature	0	3	0	0	0	0	0	0	0	0
Open-ended interview	0	1	0	0	0	0	2	0	0	0
Physiological measure	0	0	1	0	0	1	0	1	0	0
Public data	0	2	0	1	0	0	0	0	0	0
Closed-ended questions	0	2	0	0	0	0	0	0	0	0
Questionnaire interviews	0	0	0	0	1	0	1	0	0	0
Reflections	0	2	0	0	0	0	0	0	0	0
Open discussions	1	0	0	0	0	0	0	0	0	0
Phenomenological descriptions	0	0	0	0	0	1	0	0	0	0
Semi-structured interviews	0	0	0	0	0	1	0	0	0	0
Structured interview	0	0	0	0	1	0	0	0	0	0

Data collection	Social Psychology	Psychological Practice	Psychometrics	Health Psychology	Cognitive psychology	Physiological Psychology	Developmental Psychology	Experimental Psychology	Personality	Education and Learning
Unstructured interview	1	0	0	0	0	0	0	0	0	0
Visual data	1	0	0	0	0	0	0	0	0	0
Data collection method	0	0	0	0	0	0	0	0	0	0
Total	43	44	25	11	12	11	9	7	2	2

Data analysis. Results for data analysis across all topics is presented in Table 6, and the highest occurring data analysis per topic is shown in figures 6 to 15. As can be seen data analysis typically concurred with the research methods identified (Table 6). Descriptive statistics (13.69%) was the most common method, followed by correlational analysis (6.85%), Cronbach's alpha (5.06%) and chi-square tests (3.87%) for studies associated with quantitative research methods. Data analysis associated with qualitative studies mainly consisted of thematic analysis (5.36%), narrative analysis (1.49%) and content analysis (1.19%), whereas reviews were often coded (0.89%) or categorised (0.60%). Additionally, 2.38% of data analysis methods were not stated.

Figure 6

Data analysis frequency in Social Psychology research topic in the South African Journal of Psychology

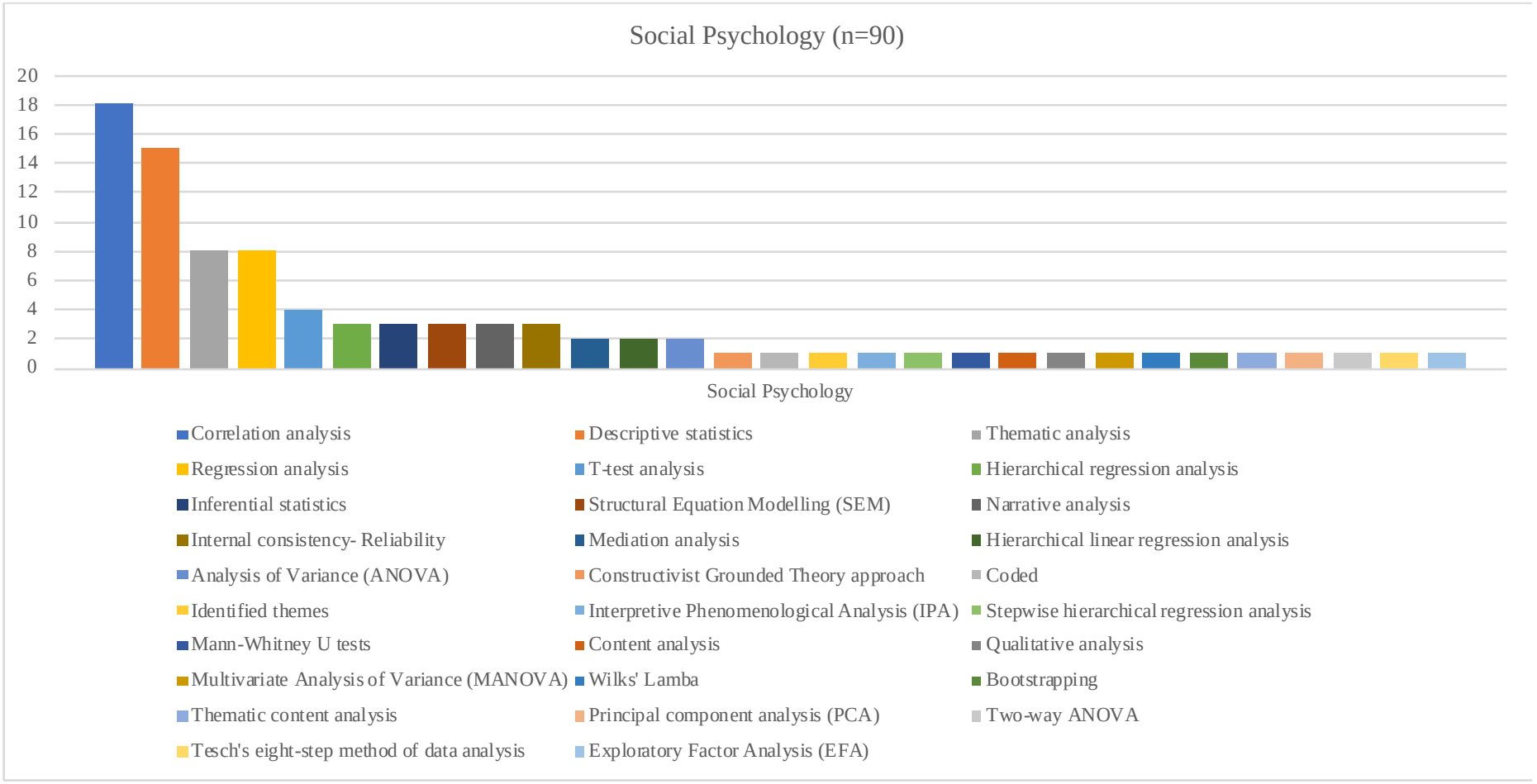


Figure 7

Data analysis frequency in Psychological Practice research topic in the South African Journal of Psychology

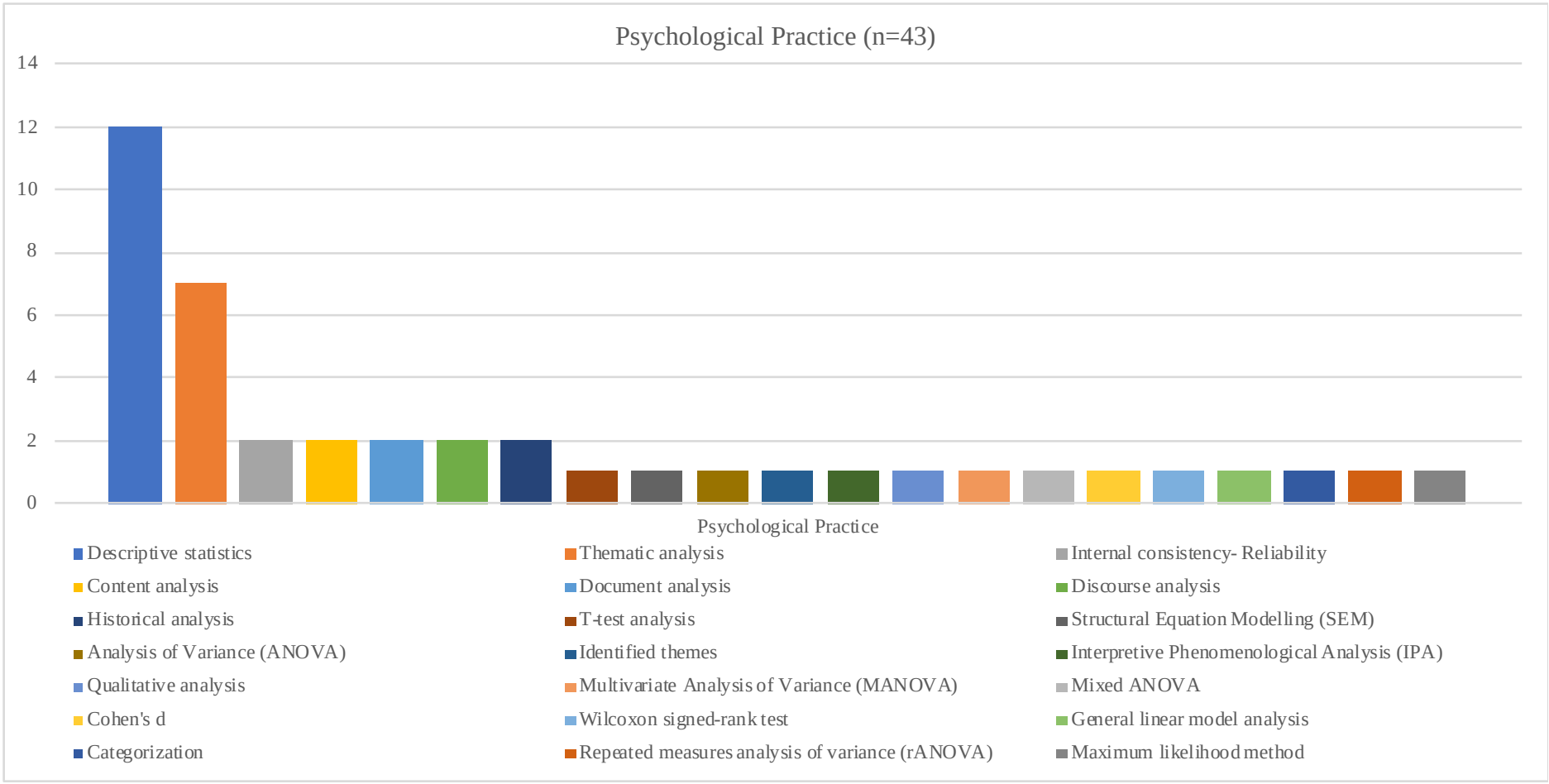


Figure 8

Data analysis frequency in Psychometrics in the South African Journal of Psychology

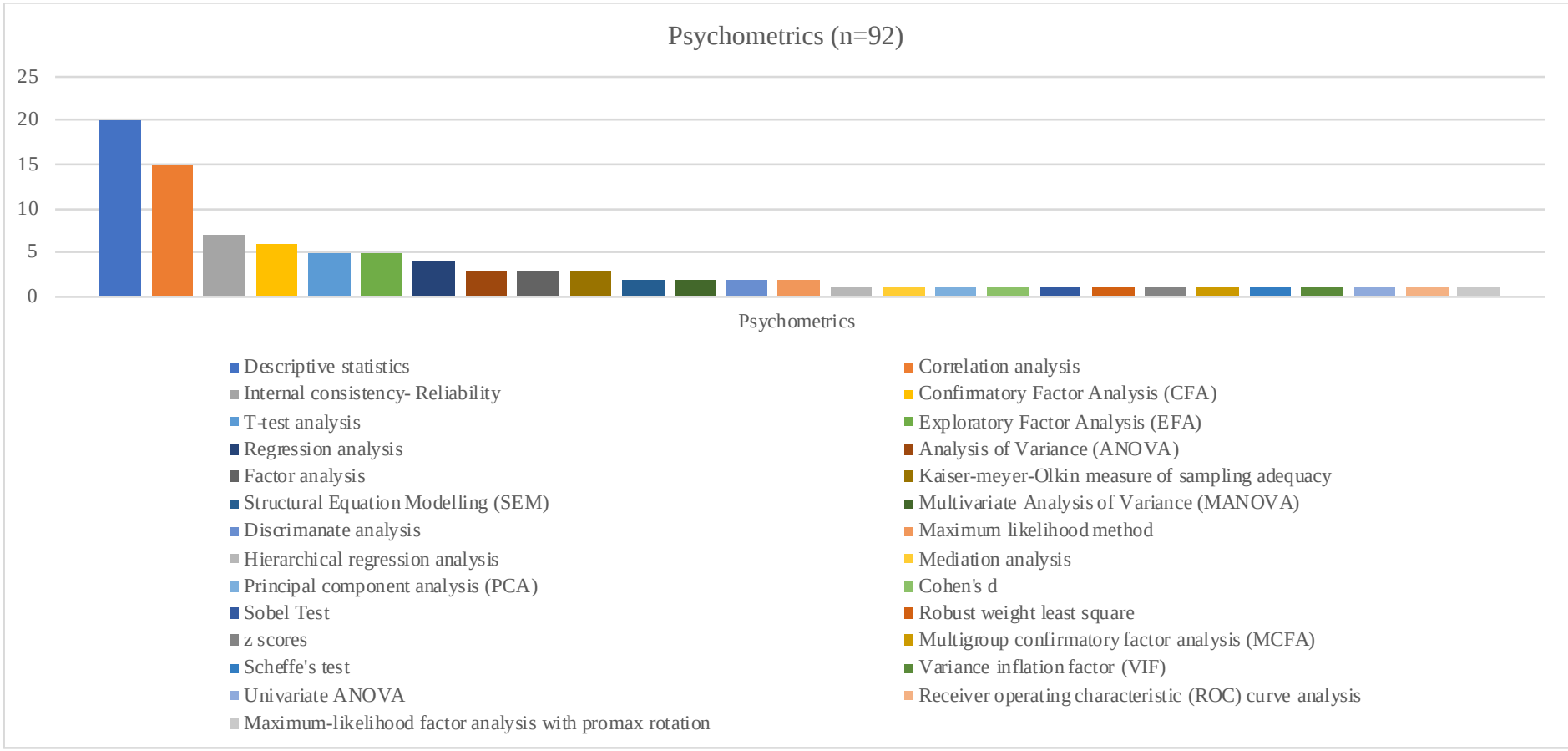


Figure 9

Data analysis frequency in Health Psychology research topic in the South African Journal of Psychology

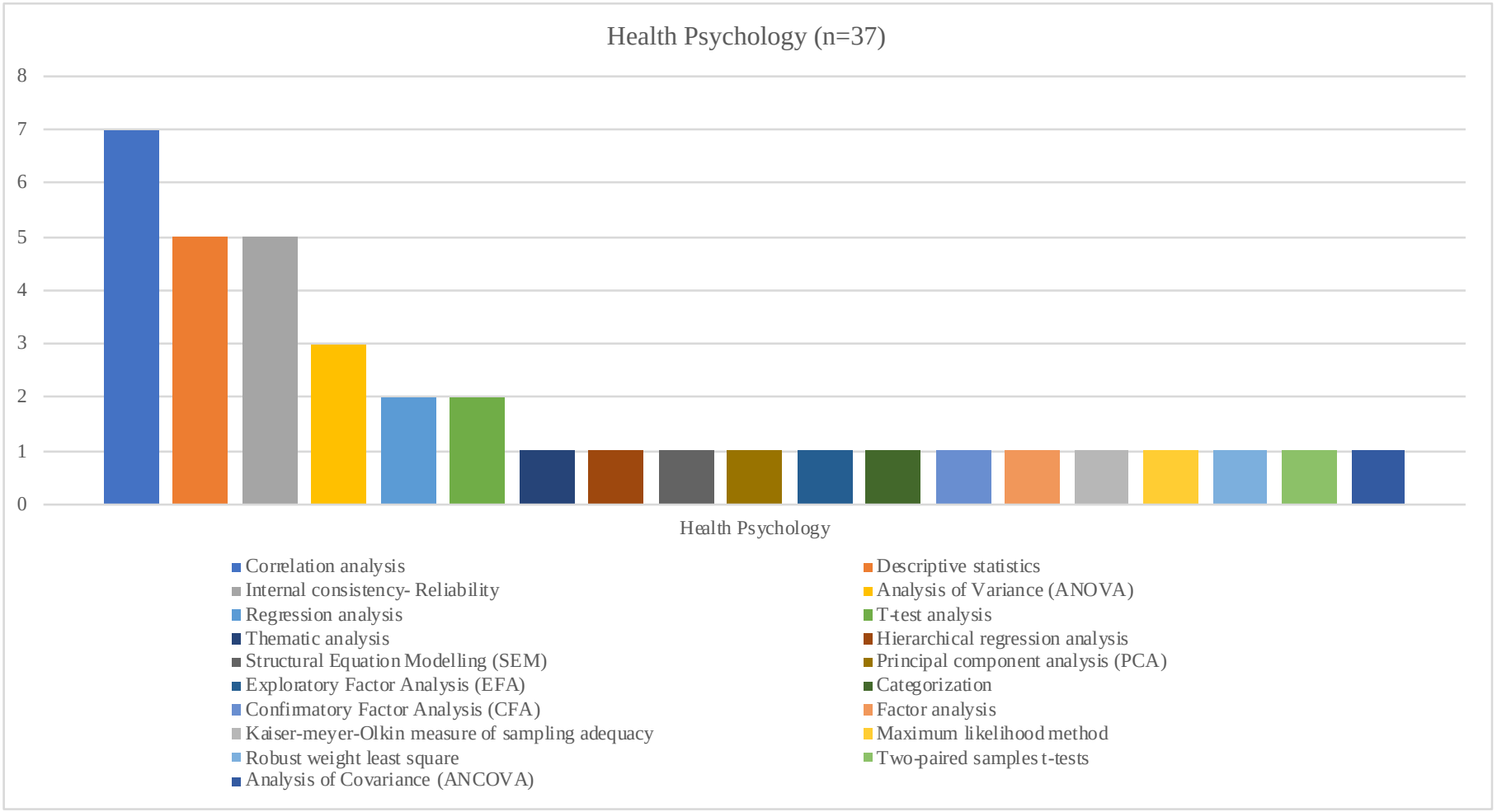


Figure 10

Data analysis frequency in Cognitive Psychology in the South African Journal of Psychology

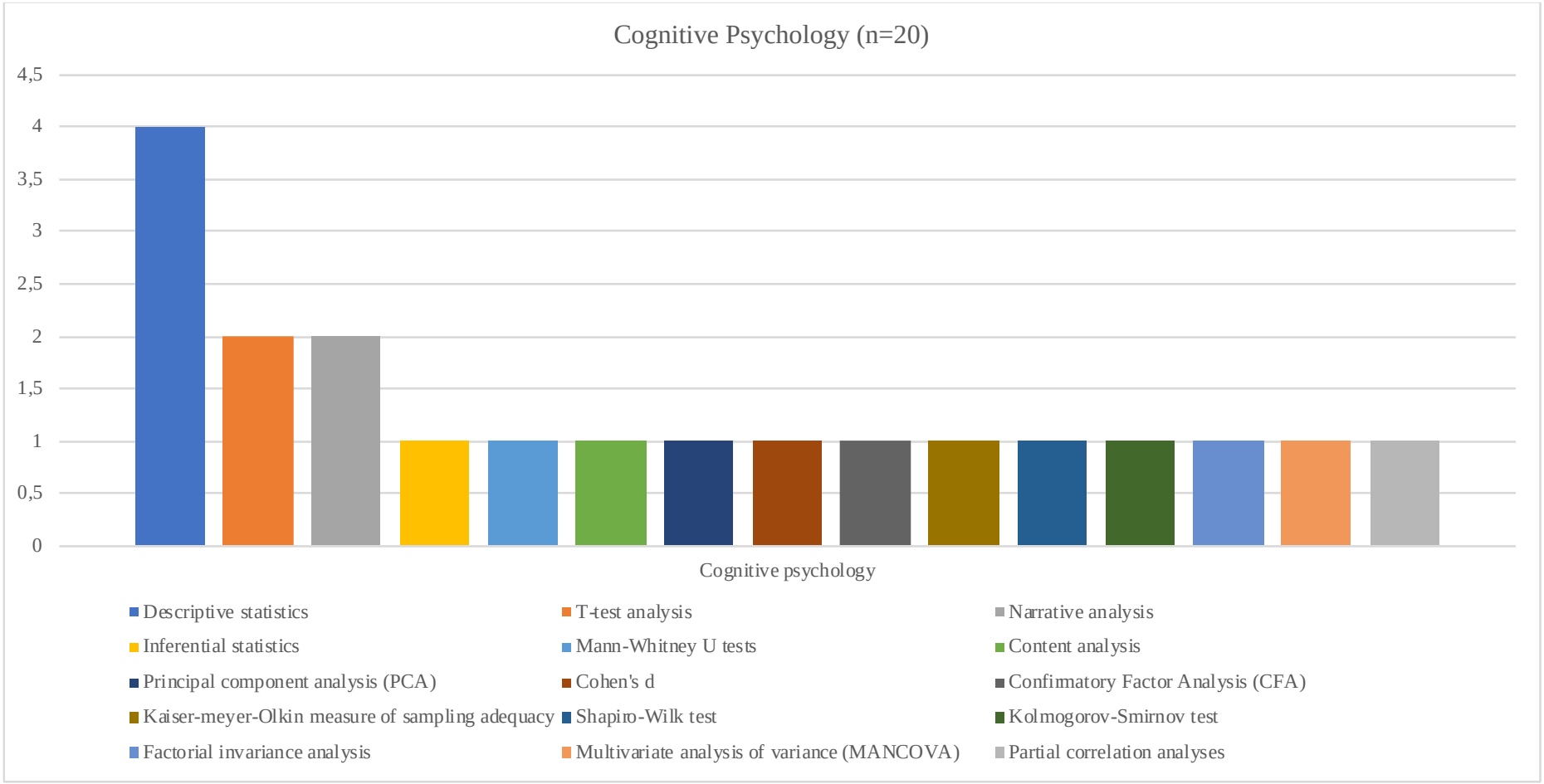


Figure 11

Data analysis frequency in Physiological Psychology in the South African Journal of Psychology

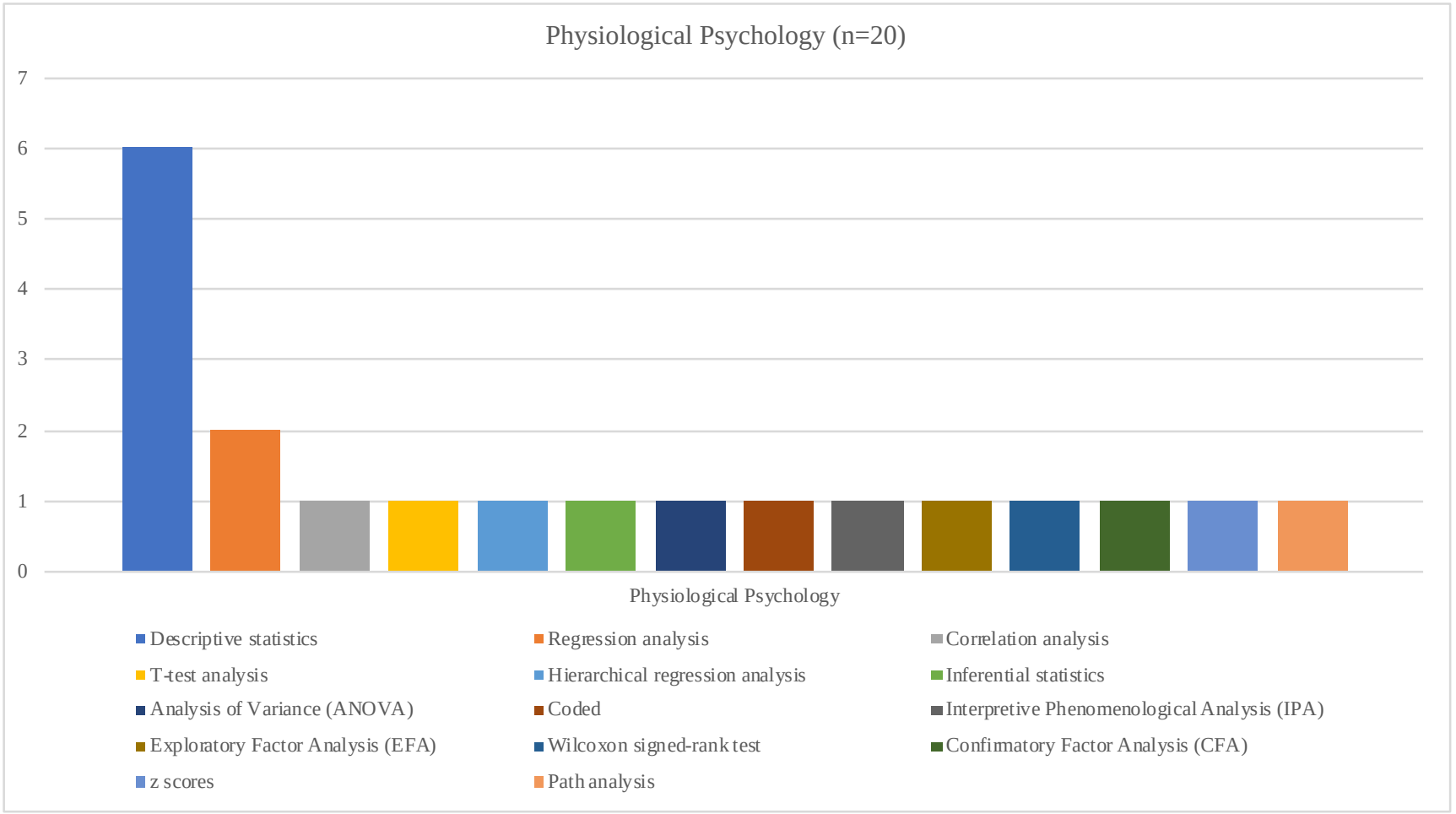


Figure 12

Data analysis frequency in Developmental Psychology research topic in the South African Journal of Psychology

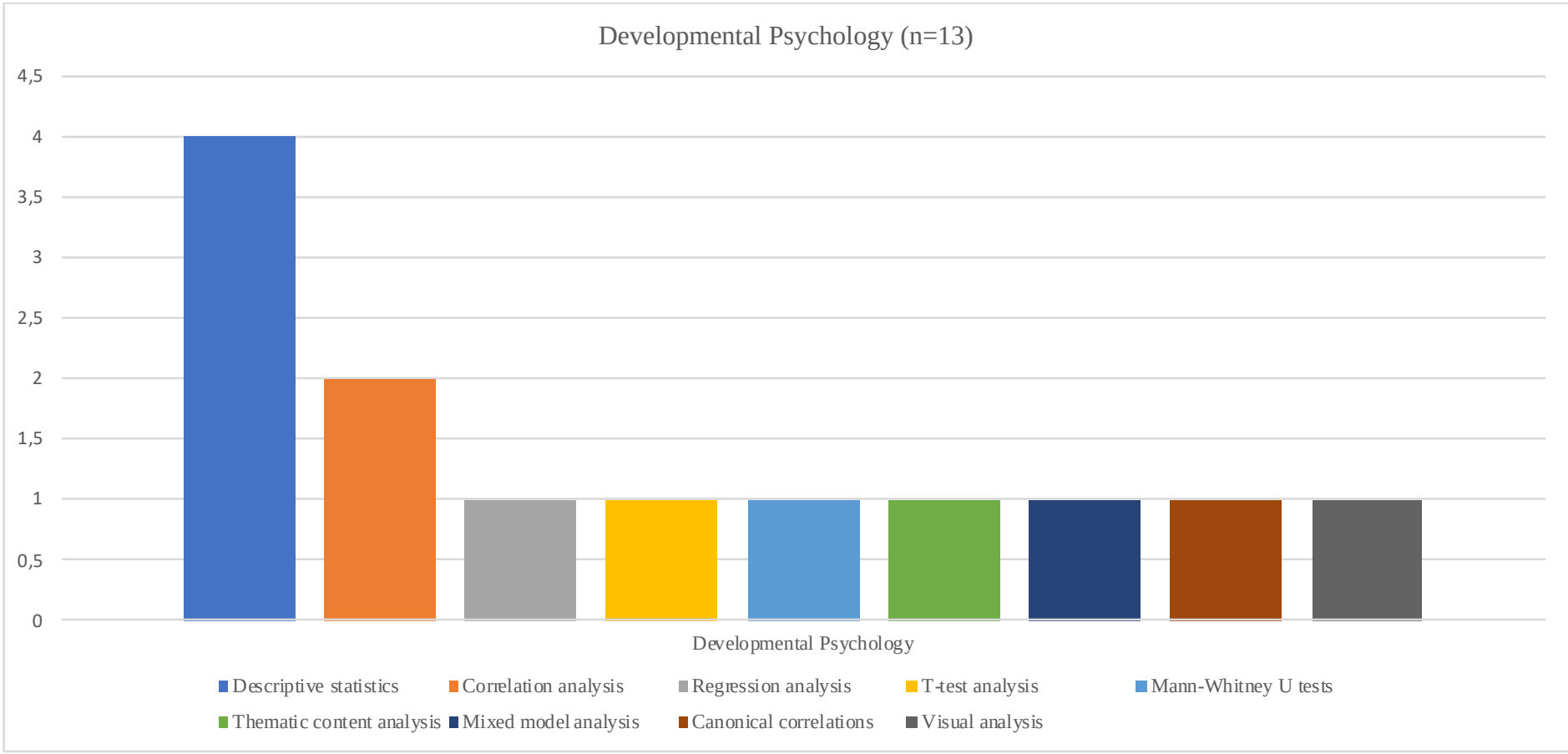


Figure 13

Data analysis in Experimental Psychology research topic in the South African Journal of Psychology

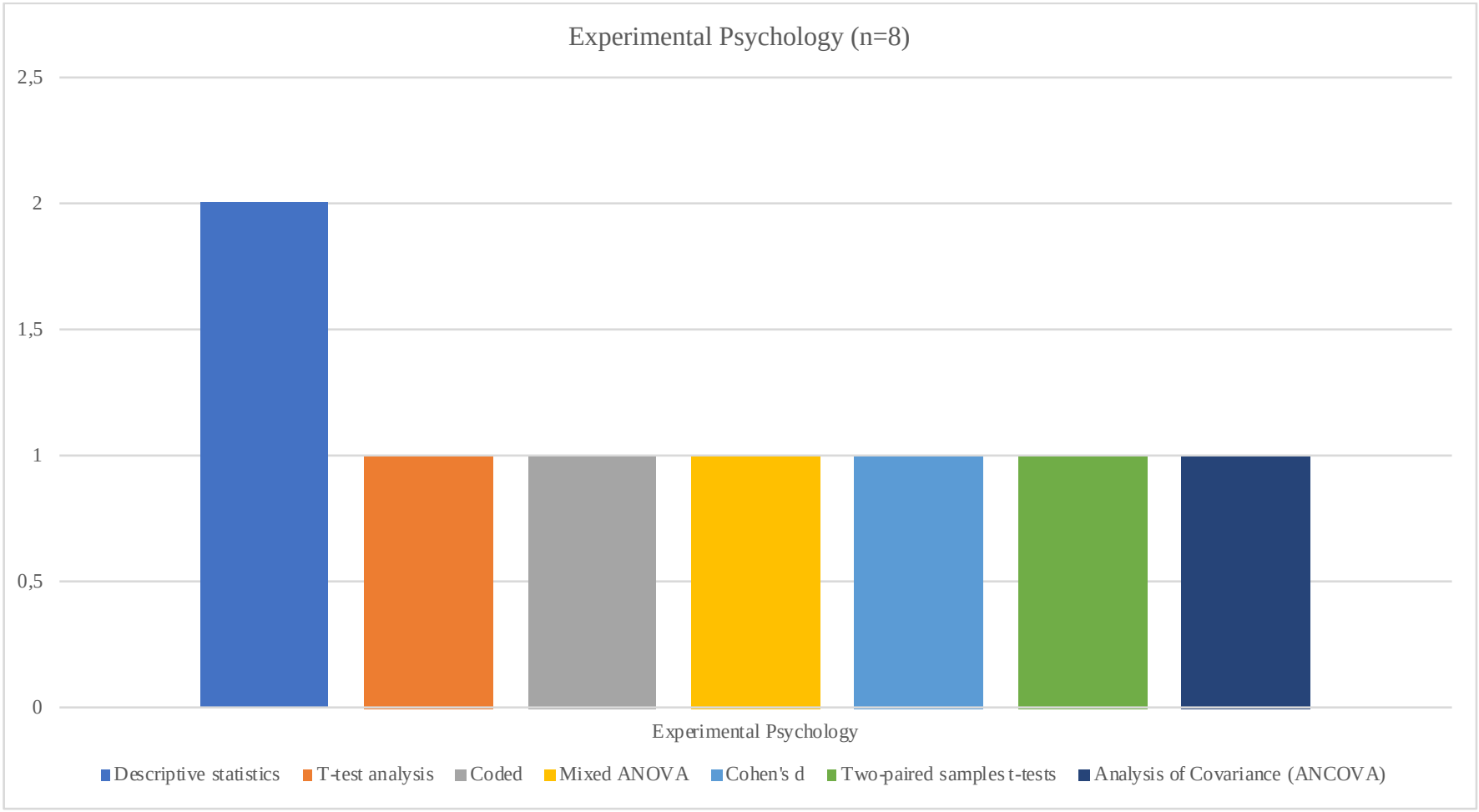


Figure 14

Data analysis in Personality research topic in the South African Journal of Psychology

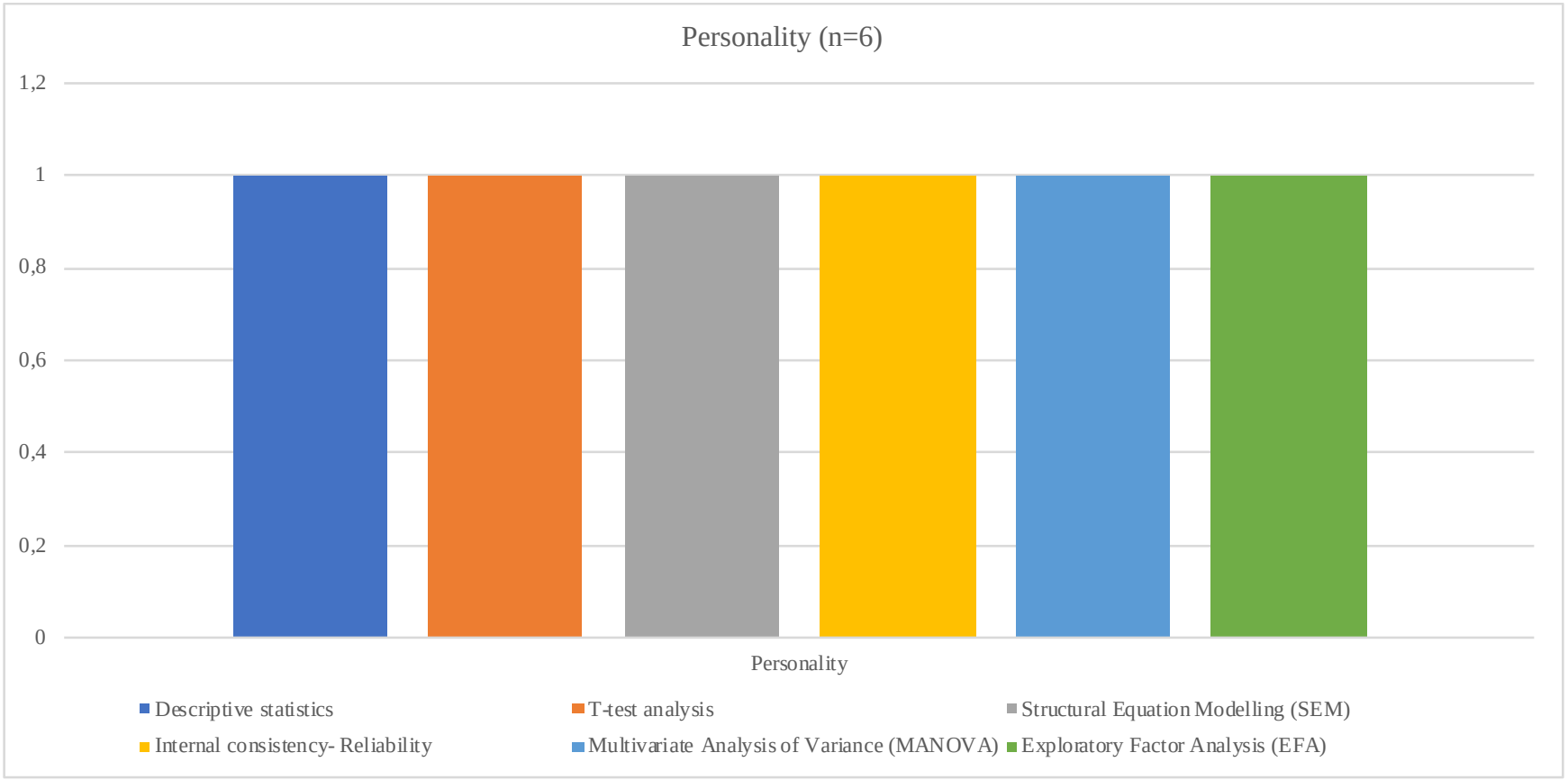


Figure 15

Data analysis frequency in Education and Learning research topic in the South African Journal of Psychology

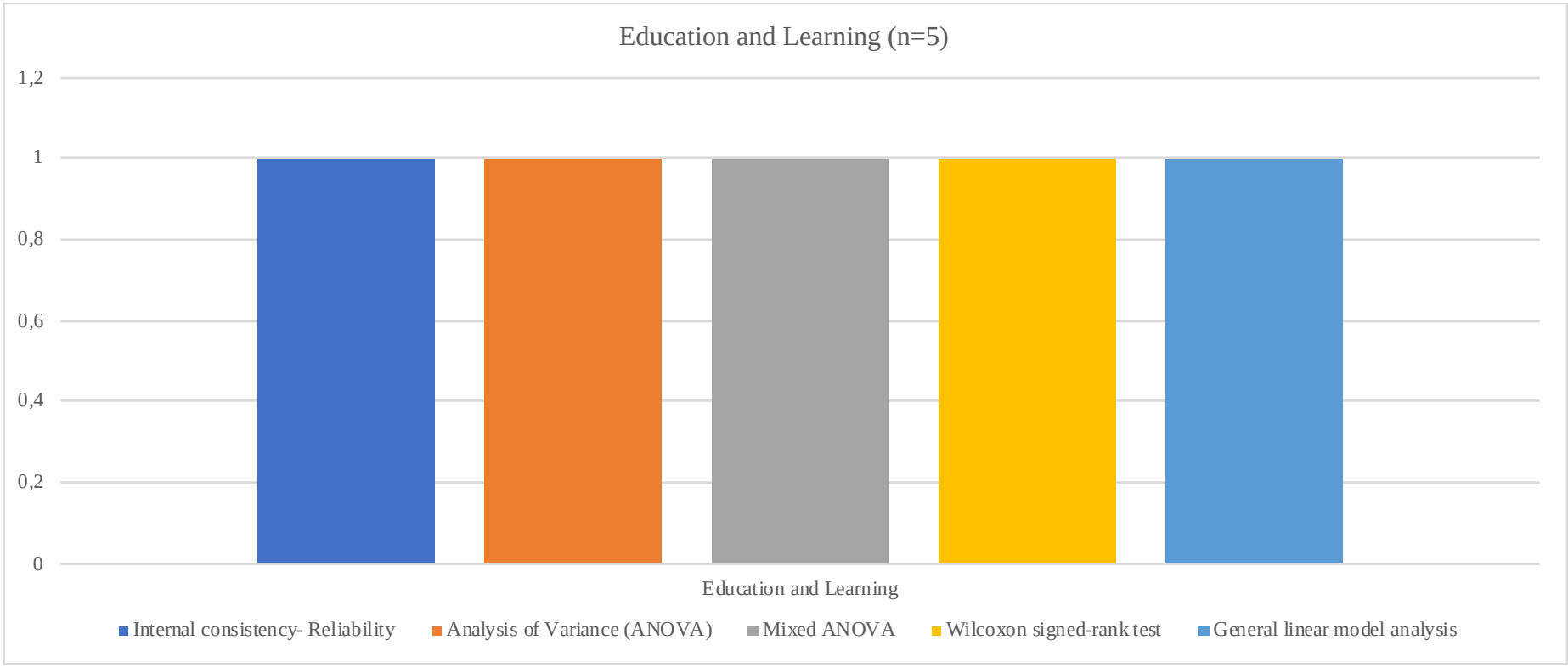


Table 6

Data analysis methods in the South African Journal of Psychology

Data analysis	Social Psychology	Psychological Practice	Psychometrics	Health Psychology	Cognitive psychology	Physiological Psychology	Developmental Psychology	Experimental Psychology	Personality	Education and Learning
Analysis of Covariance (ANCOVA)	0	0	0	1	0	0	0	1	0	0
Analysis of Variance (ANOVA)	2	1	3	3	0	1	0	0	0	1
Bootstrapping	1	0	0	0	0	0	0	0	0	0
Canonical correlations	0	0	0	0	0	0	1	0	0	0
Categorization	0	1	0	1	0	0	0	0	0	0
Coded	1	0	0	0	0	1	0	1	0	0
Cohen d effect size	0	1	1	0	1	0	0	1	0	0
Confirmatory Factor Analysis (CFA)	0	0	6	1	1	1	0	0	0	0
Constructivist Grounded Theory approach	1	0	0	0	0	0	0	0	0	0
Content analysis	1	2	0	0	1	0	0	0	0	0
Correlational analysis	18	0	15	7	0	1	2	0	0	0
Descriptive statistics	15	12	20	5	4	6	4	2	1	0
Discourse analysis	0	2	0	0	0	0	0	0	0	0
Discriminant analysis	0	0	2	0	0	0	0	0	0	0
Document analysis	0	2	0	0	0	0	0	0	0	0

Data analysis	Social Psychology	Psychological Practice	Psychometrics	Health Psychology	Cognitive psychology	Physiological Psychology	Developmental Psychology	Experimental Psychology	Personality	Education and Learning
Exploratory Factor Analysis (EFA)	1	0	5	1	0	1	0	0	1	0
Factor analysis	0	0	3	1	0	0	0	0	0	0
Factorial invariance analysis	0	0	0	0	1	0	0	0	0	0
General linear model analysis	0	1	0	0	0	0	0	0	0	1
Hierarchical linear regression analysis	2	0	0	0	0	0	0	0	0	0
Hierarchical regression analysis	3	0	1	1	0	1	0	0	0	0
Historical analysis	0	2	0	0	0	0	0	0	0	0
Identified themes	1	1	0	0	0	0	0	0	0	0
Inferential statistics	3	0	0	0	1	1	0	0	0	0
Internal consistency- Reliability	3	2	7	5	0	0	0	0	1	1
Interpretive Phenomenological Analysis (IPA)	1	1	0	0	0	1	0	0	0	0
Kaiser-meyer-Olkin measure of sampling adequacy	0	0	3	1	1	0	0	0	0	0
Kolmogorov-Smirnov test	0	0	0	0	1	0	0	0	0	0
Mann-Whitney U tests	1	0	0	0	1	0	1	0	0	0
Maximum likelihood method	0	1	2	1	0	0	0	0	0	0
Maximum-likelihood factor analysis with promax rotation	0	0	1	0	0	0	0	0	0	0
Mediation analysis	2	0	1	0	0	0	0	0	0	0

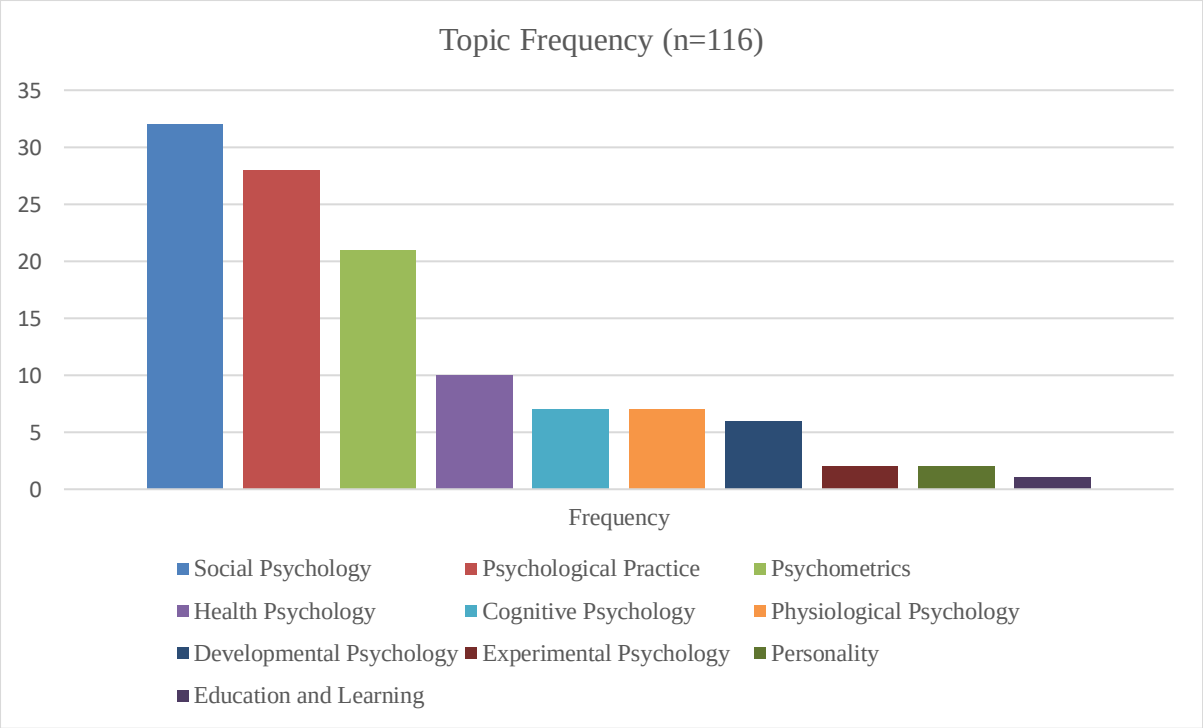
Data analysis	Social Psychology	Psychological Practice	Psychometrics	Health Psychology	Cognitive psychology	Physiological Psychology	Developmental Psychology	Experimental Psychology	Personality	Education and Learning
Mixed ANOVAs	0	1	0	0	0	0	0	1	0	1
Mixed model analysis	0	0	0	0	0	0	1	0	0	0
Multigroup confirmatory factor analysis (MCFA)	0	0	1	0	0	0	0	0	0	0
Multivariate analysis of variance (MANCOVA)	0	0	0	0	0	0	0	0	1	0
Multivariate Analysis of Variance (MANOVA)	1	1	2	0	1	0	0	0	0	0
Narrative analysis	3	0	0	0	2	0	0	0	0	0
Partial correlation analyses	0	0	0	0	1	0	0	0	0	0
Path analysis	0	0	0	0	0	1	0	0	0	0
Principal axis extraction	0	0	0	0	1	0	0	0	0	0
Principal component analysis (PCA)	1	0	1	1	0	0	0	0	0	0
Qualitative analysis	1	1	0	0	0	0	0	0	0	0
Receiver operating characteristic (ROC) curve analysis	0	0	1	0	0	0	0	0	0	0
Regression analysis	8	0	4	2	0	2	1	0	0	0
Repeated measures analysis of variance (rANOVA)	0	1	0	0	0	0	0	0	0	0
Robust weight least square	0	0	1	0	0	0	0	0	0	0
Scheffe's test	0	0	1	0	0	0	0	0	0	0
Shapiro-Wilk test	0	0	0	0	1	0	0	0	0	0

Data analysis	Social Psychology	Psychological Practice	Psychometrics	Health Psychology	Cognitive psychology	Physiological Psychology	Developmental Psychology	Experimental Psychology	Personality	Education and Learning
Sobel Test	0	0	1	0	0	0	0	0	0	0
Stepwise hierarchical regression analysis	1	0	0	0	0	0	0	0	0	0
Structural Equation Modelling (SEM)	3	1	2	1	0	0	0	0	1	0
T-test analysis	4	1	5	2	2	1	1	1	1	0
Tesch's eight-step method of data analysis	1	0	0	0	0	0	0	0	0	0
Thematic analysis	8	7	0	1	0	0	1	0	0	0
Thematic content analysis	1	0	0	0	0	0	0	0	0	0
Two-paired samples t-tests	0	0	0	1	0	0	0	1	0	0
Two-way ANOVA	1	0	0	0	0	0	0	0	0	0
Univariate ANOVA	0	0	1	0	0	0	0	0	0	0
Variance inflation factor (VIF)	0	0	1	0	0	0	0	0	0	0
Visual analysis	0	0	0	0	0	0	1	0	0	0
Weighted least squares with corrections to means and variances (WLSMV)	0	0	0	1	0	0	0	0	0	0
Wilcoxon signed-rank test	0	1	0	0	0	1	0	0	0	1
Wilks' Lamba	1	0	0	0	0	0	0	0	0	0
z scores	0	0	1	0	0	1	0	0	0	0
Total:	**90**	**43**	**92**	**37**	**20**	**20**	**13**	**8**	**6**	**5**

Topics. Research articles were categorised based on the definitions in Table 1. The most popular research topic (Figure 16) was found to be social psychology (28.0%), followed closely by psychological practice (24.0%). Thereafter, psychometrics (18.0%), health psychology (9.0%), cognitive psychology (6.0%), developmental psychology (5.0%), and experimental and personality – each amounting to 2.0%. Lastly, only one study fell under the topic of education and learning (1.0%).

Figure 16

Topic frequency in the South African Journal of Psychology



Discussion

This review utilised a systematised design in order to explore the use of research methods in the SAJP across the span of five years. To the author's knowledge, this is the first study that has addressed the use of research methods in this specific context for this aim. A discussion of key results on *what methods are being used, how these methods are being used and for which topics in the South African Journal of Psychology* is presented below.

The type of research methods that were most often used for psychological research in this South African sample were found to be quantitative and qualitative methods. This result concurs with results found by Macleod and Howell (2013), in that SAJP displayed a decline in quantitative methods and an increase in qualitative methods, by comparing the frequencies between both studies. This decrease can also be seen in reviews (Macleod & Howell, 2013). Results from international journals, however, found that – despite qualitative methods being the second highest occurring method – its frequency was a mere 4.79% compared to the 90.22% of quantitative methods (Scholtz et al., 2019). Opposite results than those found here were also found for the publication of reviews (3.91%) of international journals (Scholtz et al., 2019). According to Kramer et al. (2019), there are distinct differences in the use of research methodology between the global North and South. Typical quantitative research methods are considered popular with the former, and qualitative research methods are more frequently utilised by the latter (Kramer et al., 2019). Quantitative research methods are seen as too rigid and are therefore encouraged to transform and become more flexible to fit with knowledge-generation in South Africa (Kramer et al., 2019). The growth in qualitative research could also be explained by the lack of application of global research practices (Ezeh et al., 2010), or limited technological and statistical advances available in the field of psychology (Sharpe, 2013) due to little or no exposure in graduate training (Counsell, Cribbie, & Harlow, 2016). This, along with lack of skills and awareness, could all contribute to the low publication rate of mixed methods research (Povee & Roberts, 2015).

For the remainder of the methodological aspects, the authors found a lack of transparency in terms of clearly stating the methodology applied – such as sampling method and design – which could be seen in the “not stated” figures. This lack of transparency was also found by Scholtz et al. (2019), and for some aspects of sampling in Macleod and Howell (2013). Transparency is viewed by Tuval-Mashiach (2016) as the researchers’ attempt to

openly communicate the research process to the reader as a way to improve trustworthiness and rigour. This also allows researchers the opportunity to replicate studies and adopt new methods (Tuval-Mashiach, 2016), which is an imperative aspect of research as a whole. Additionally, the identification of "hot" research topics and trends can only be obtained by disclosing research *comprehensively* (Friedman, 2008). Journal requirements (Laher, 2016) along with general confusion about research terminology (O'Neil & Koekemoer, 2016) could serve as possible explanations for this occurrence.

It is, however, noteworthy to highlight that, despite the high frequency of "not stated" samples, samples of convenience were the most popular sampling method, which corresponds with results from international journals Scholtz et al. (2019) and Macleod and Howell (2013). Using samples of convenience holds various disadvantages, especially with regard to generalisability. Despite the disadvantages, the fact that this sampling method is simple, cheap and efficient will most likely insure its continued use in the various fields of psychology (Jager, Putnick, & Bornstein, 2017). Furthermore, sampling is often influenced by the history between the field of psychological research and ethnic groups, as well as socioeconomic factors that limit possible participants' resources and ability to partake in studies (Awad, Patall, Rackley, & Reilly, 2016). This could explain the high use of convenience and purposive sampling methods.

Results on data collection and analysis concurred with that of international trends (Scholtz et al., 2019). The high number of qualitative studies are evident in the high frequency of interviews. This result testifies to the concept of the researcher partaking in the research process and generating knowledge with the participant. Future research could investigate the use of these data collection methods within each sub-theme or code used to

derive the broad research topics, to discern in which area this collection method is the most popular and why.

The topics covered in the SAJP were found to be somewhat similar to international trends. Social psychology is indeed seen as key research area in the future (Scholtz et al., 2019), which shows that publications are holding true to hot topics in the field. However, the lack of research on forms of education and learning should be investigated, especially in the educational context of South Africa. This result contradicts that of Macleod and Howell (2013), who found education and academic performance to be a popular topic in the SAJP between 2007 to mid-2012. Education is seen as an important driver for addressing various social and economic issues in South Africa (Khosa, 2013). A possible explanation for this low frequency could be that articles of this type are prone to be published in other, education-specific journals. However, the previous report of publication on this topic makes this unlikely. Additionally, psychological practice was very popular. The high frequency of this topic is understandable, based on the transformation the field of psychology has experienced in the context of South African history, and was also found to be a topic of interest by Macleod and Howell (2013). However, this topic was only the 8th highest occurring topic in the international sample; other topics such as cognitive psychology preceded it (Scholtz et al., 2019).

Conclusion

This study shows current research trends in the use of research methods for psychological research in South Africa through the lens of the SAJP. These results indicated areas of research interest which represent not only current social phenomena in South Africa, but also how it was addressed by the scientific community. The results showed the publication frequency of a range of identified topics in the SAJP. The research methods

employed could be interpreted as representative of the knowledge generation culture in South Africa. The popularity of qualitative research in South Africa illustrates the adaptability of the method to the context of Africa. However, the decline in quantitative studies in South Africa should be investigated in future research, as international journals illustrate the opposite trend and Africa's contribution to the global knowledge economy should grow. Additionally, the authors strongly encourage a clearer form of communication (Tuval-Mashiach, 2017) on the representation of the research process with regard to its methodology; not only to promote trustworthiness in results, but to increase the value of research methods such as that of qualitative research methods. This, along with the apparent growth in usage could contribute to the development of qualitative research methods and support its application in the South African context.

With regard to sampling, the frequent use of convenience sampling is a concern, as it has many disadvantages. However, the authors recommend that future research in South Africa should aim to conduct research that addresses these disadvantages to creatively form and apply this method to the country's own research culture (Jager et al., 2017).

The categorisation of this systematised design allowed for exploration of the research beyond its predefined topics. Psychological practice was discovered as popular topic for new research, which may be due to the transformation of the field of psychology after South Africa's history of *apartheid* (Cooper & Nicholas, 2012). However, the high frequency of this topic, (i.e. only four articles less than the highest occurring topic in social psychology) moved the authors to caution against a preoccupation with the publication of our experiences, and sharpening our skills and practitioner tools, lest it overshadow the other fields of research. Concurrently, we also recommend shifting our focus to research topics that broadly address issues being experienced by the South African public as indicated by Macleod and

Howell (2013). Additionally, education and learning was underrepresented in this sample, and it is recommended that this result also be further investigated.

The following limitations of the study should be reported. *Firstly*, the sample of this study was only based on a single South African journal and it is recommended that a larger sample be consulted to address the same research question. *Secondly*, the categories of this systematised design were based on information that was clearly stated in the published articles, thus methods or designs not as overtly stated may have been overlooked and excluded from the analysis. *Thirdly*, the systematised review design is not a well-known design and the authors followed and presented the process of conducting this method according to previous research. Lastly, data were captured using an online log as well as Excel worksheets for which co-coding was used to address the limitation of errors in data capturing.

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CHAPTER 5 A DATA GENERATED RESEARCH FRAMEWORK FOR CONDUCTING RESEARCH METHODS IN PSYCHOLOGICAL RESEARCH (ARTICLE 3)

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A data generated research framework for conducting research in psychological research

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Abstract

The importance of research method knowledge cannot be overstated. Despite this importance, there is a lack of adequate research skills in academia. To address this lack of skills this article introduced and evaluated a research framework (Method Garden) to provide knowledge on research methods and how to apply them. The framework was created based on 999 published journal articles collected and analysed in a previous study. A small sample (eight participants) of research experts from the field of psychology evaluated the usefulness of the framework. Results indicated that participants perceived the framework to be generally useful in providing knowledge and insight into research methodology. Participants also rated it as appropriate for students and teaching, although little willingness was shown to apply the framework in their research. The results and limitations found in this study should be used as the first step for further development of this data generated research framework.

Keywords: research methods, psychological research, research framework, conducting research, research designs.

Introduction

Research is driven by our pursuit to enhance our understanding and feed our hunger for answers to unresolved questions (Bryman, 2016) as a way to build scientific knowledge (Bhattacherjee, 2012). One of the skills researchers require to generate this knowledge is methodological competence; knowledge of scientific methods include various research tools and approaches to conducting research (Bhattacherjee, 2012; Nieuwenhuis, 2016). However, discrepancies and insufficient knowledge of the application of these research methods cause various problems (see Ngulube, 2013; Levitt, Motulsky, Wetz, Morrow, & Ponterotto, 2017; Scott Jones & Goldring, 2015). Literature shows that knowledge in research methods is lacking and requires support in the field of academia (Scott Jones & Goldring, 2015; The British Psychological Society, n.d.), research publication (Levitt et al., 2017) and projects addressing social issues (Dweck, 2017). Sandelowski (2011) states that despite the crossing of methodological boundaries in research practice, clarity on how research should be conducted needs to be established. Despite the influences (see Grix, 2002; Nind, Kilburn, & Wiles, 2015; O'Neil & Koekemoer, 2016) and differences in applying research methods, Di Nuovo (2014) agrees that global methodological guidelines should be adhered to.

According to Bitterman and Fischer (2018), topics or research trends are a good starting point for devising any synthesis of research methods. Therefore, in an attempt to shed light on the application of global research methods and possibly improve clarity and research knowledge, this article develops and evaluates a data-generated research framework called Method Garden which is available at https://methodgarden.xtrapolate.io/.

The aims of this study were twofold and addressed via two phases. In phase 1, the research framework, based entirely on data (i.e. published research articles), was created. This data was drawn from the results of Scholtz, De Klerk and De Beer (2019), who categorized the use of research methods in psychology on the basis of 999 articles from

international top-tier psychology journals. A list of these articles is available on the Method Garden website under “View Articles”.

The framework aimed to clarify the application of research methods by presenting what research topic to combine with which research method and the steps to follow in conducting that method (design, data collection, sampling, data analysis) according to journal publications. This aim was achieved by organizing the results from Scholtz et al. (2019) into a general structure for conducting research (Figure 2, Appendix 2), which was found to be similar in a preliminary search of published academic articles (see see Ingham-Broomfield, 2014; Johnson & Owuegbusie, 2004; McCusker & Gunaydin, 2015; Venkatesh et al., 2013) and textbooks (see Creswell & Plano Clark, 2011; Harwell, 2011; Maree, 2016; Morse & Niehaus, 2016; Patton, 2017).

The expectation was that this preliminary research framework would assist future students and researchers to use various research methods by providing knowledge and insight into the methods associated with certain topics, and how these methods were being employed in psychological research practice. This insight may inform researchers how to conduct the various research methods and their designs and when to use these research methods (i.e. for what topics).

To ensure a rigorous account of the framework and to discern whether it has fulfilled the authors’ expectations of improved research knowledge and insight, a small group of research experts within the field of psychological research evaluated the framework in phase 2 of this article. Phase 2 focused on answering the following research question: *What is the perceived usefulness of the generated research framework?* A summative evaluation was applied in the form of an impact or outcome evaluation to gain insight into the effect and possible unintended effects on the anticipated outcome of the framework (Rossi, Lipsey, & Freeman, 2004). These effects refer to outcomes within the

chosen sample that would not have been possible if the framework had not been developed (Fouché, 2011). The positive effect envisioned for this study was improved research knowledge and insight, or the perception of improved competence in using the framework for various research methods. Impact evaluations are applicable at all stages of a framework's life cycle; however, Rossi et al. (2011) suggests employing an impact evaluation before applying the framework to a broader context. Figure 1 presents a visual representation of the process that was followed in conducting this study.

Method

Design

Evaluative studies (Phase 2) can employ either a qualitative, quantitative or mixed method design (Bamberger, Rugh, & Mabry, 2006); however, key informant surveys are identified as especially applicable for impact or outcome evaluations (Fouché, 2011). Kreuger and Neuman (2006) hold that non-experimental designs are applicable when conducting impact evaluation studies. Hence, this study employed a quantitative descriptive online survey to ask closed-ended questions to key informants regarding their perception of the usefulness or impact of the framework. Participant responses were in the form of a Likert scale, as it is most commonly used to determine to what extent a participant agrees or disagrees with a certain statement (Maree & Pietersen, 2016). Aspects identified by Muijs (2011) for the development of a short descriptive survey were considered for the creation of this survey.

This online survey consisted of a presentation of the research framework, informed consent, and a short list of closed-ended statements that participants were prompted to answer after performing two actions. The first action was to choose a topic the participant had investigated in the past, and to follow the sequence of framework steps in conducting the method linked with the topic. After completing the first action, the participant was

asked to rate their experience of the framework according to a list of closed-ended statements on a five-point Likert scale of ordinal variables ranging from Strongly Disagree to Strongly Agree (See Appendix 3 for survey questions).

Sampling

For phase 2, key informants (Fouché, 2011) were chosen through purposive sampling (Maree & Pietersen, 2016). A purposive sample of academics who had made use of the website ResearchGate to conduct research were asked to take part in this evaluation study. The sample consisted of academics who had conducted psychology research, had internet access, and had published at least 10 academic articles.

Sample sizes for quantitative methods can be relatively small, especially when using uncomplicated statistical techniques (Maree & Pietersen, 2016) such as frequency distribution. The aim was to include a small sample of 20 participants for this study. However, not all invitees responded and 11 participants took part in the study, with only 8 submitting completed surveys.

Data analysis

JASP 0.11.1 (JASP Team, 2018) was employed to produce descriptive statistics for analysis of the data from the online survey (Muijs, 2011) and determine the frequency distributions on the included scale items (survey questions). The software (JASP, 2019) calculated means, frequency distribution, standard deviation, as well as minimum and maximum values for each of the 15 scale items (survey questions). Median absolute deviation (MAD: Robust), which is not affected by data that is not normally distributed, was additionally used to determine the spread of data (Goss-Sampson, 2019). Thus, the MAD measure (Goss-Sampson, 2019) reports the median of data not normally distributed as equivalent to the mean of normally distributed data.

Validity

Face validity was applied to determine whether the survey measured what it had been designed for. Face validity is established by reading the items (statements) on the survey and determining if what it appears to be addressing concurs with what the measures were designed for (Roodt, 2009). Thus, experts in the field of psychological research (i.e. persons who have published articles in psychological research) at the North-West University were asked to establish face validity for this survey.

Procedure

The procedure that was followed to conduct this study is represented in Figure 1 (Appendix 2). In phase 1, the research framework was developed from data collected in Scholtz et al. (2019), which was logged on an online data base for categorization in tabular form. These categories were coded into the framework identified in Figure 2, Appendix 2. Thus, the articles included in Scholtz et al. (2019) were categorized by research topic, method, sampling, data collection and data analysis. These categories were transferred into the structure shown in Figure 2 and visually presented online through Method Garden (https://methodgarden.xtrapolate.io/).

[Figure 2, Appendix 2 near here]

After the framework was completed, the research continued to phase 2. Participants were contacted by an independent person via email, informing them of the purpose of the study and requesting their voluntary participation. The survey was conducted online (myresearchsurvey.com) via a hyperlink provided to the participant upon submission of the informed consent form. After using the research framework and completing their survey questions, participants were able to submit their surveys for data analysis.

Results

The data from the 3 incomplete surveys was removed via the listwise deletion method to ensure that data was not skewed (Harel, Zimmerman, & Dekhtyar, 2008). Results for each item (survey question) are presented in Table 1 (Appendix 1) and distribution plots are shown in Figures 3-17 (Appendix 2).

Overall, participants rated positively their experience of the framework's general usefulness in promoting knowledge and insight into research methods, with high frequency of agreement to the majority of the items (means ranging from 3.375 to 4.375). Item 5 however, averaged 2.625 (*SD* = 0.744; *MAD* = 0.744) and was the lowest rated item. It referred to participants' willingness to use the research framework in their own research, to which 50% of participants indicated that they strongly disagreed with this item. On the other hand, item 7 was the highest rated item with an average of 4.375 (*SD* = 0.744; *MAD* = 0.741), and indicated that 50% of participants strongly agreed that the research framework could assist students in their research. Additionally, 62.5% of respondents to item 6 (*M* = 4.125, *SD = 0.641*, *MAD* = 0.000[1]) agreed that they would recommend the research framework to their students, whilst 25% strongly agreed. Item 8 (*M* = 4.125, *SD* = 0.641, *MAD* = 0.000) also shows the framework's perceived usefulness as a tool in teaching, with 62.5% agreeing to this use and 25% strongly agreeing.

[Table 1, Appendix 1 near here]

[Figure 3-18, Appendix 2 near here]

Discussion

A data generated research framework named Method Garden was created and evaluated in this study. To the authors' knowledge, this was the first study to attempt to create an online research framework based solely on data from publications in top-tier

[1] MAD = 0.000/ 0 when only some increments of the scale were selected in a question. For example, only 3-4 (neutral – strongly agree) were chosen by participants in item 6 and no participant chose 1-2 (strongly disagree – disagree).

psychology journals. The creation of Method Garden aimed to address the lack of research method skills and clarity by providing knowledge and insight into how to apply research methods through an interactive online research framework. Below follows a discussion of phase 1 (creation of the framework) and phase 2 of this study (results from the evaluation study).

A few aspects of creating the research framework in phase 1 merit discussion. *Firstly*, due to the large amount of available space on an online platform, it was possible to use the original raw data form Scholtz et al. (2019) for the creation of the research framework. Therefore, the framework included all wording used in the articles for the various steps in the research process and not only the broad categories created by Scholtz et al. (2019). This provided an opportunity for more insight into the wording used by researchers in publications. Considering that research is "an activity based on the work of others" (Salkind, p. 3, 2012), this may be an important factor to incorporate as these terms are the terms researchers encounter when delving into other researchers' work to devise their own. Furthermore, including all wording allowed researchers to choose the words they were more or less accustomed to as well as providing an opportunity to see the frequency of certain terms.

The *second* aspect to consider is that the parts of the framework labelled 'not stated' were included, as presented in Scholtz et al. (2019). The inclusion of these steps served to remind researchers that research is flexible and may not concur with what is typically discussed in theory. However, it also informed researchers of the lack of transparency and rigour in the publications, through indicating the methodology steps typically not stated in research. Which is an important aspect that can be used to explain and address the current replication crisis in psychology, as meticulously following the method of the original study is the first step in replication studies (Earp & Trafimow, 2015;

Tackett, Brandes, King, & Markon, 2019). Furthermore, excluding the 'not stated' options might have excluded researchers who have different views on which aspects of the research process are important to state, which was clearly the case in many of the articles included in Scholtz et al. (2019). From a practical perspective, excluding these steps would also have excluded the research processes that followed them, and would have led to loss of information.

Thirdly, the framework may include research steps that may seem peculiar in the context of the research theory, as it constitutes the combination of methodologies. This is due to the fluidity and interchangeable use of research methods in practice (Scholtz et al., 2019). According to Bhattacherjee (2012), the use of a combination of qualitative and quantitative research techniques, such as the inclusion of open-ended questions (qualitative) in a structured questionnaire (quantitative), should be encouraged. Salkind (2012) concurs that the combining of methodologies is expected to increase from well-trained sophisticated researchers who employ more than one method in their studies which may be found to be unclear and unprecise. However, this is seen as more informative and the best way to observe phenomena (Salkind, 2012).

Phase 2 was employed to determine the perceived worth or usefulness of the presented research framework through an evaluation study (Payne & Payne, 2004). For most of the items, results indicated that the participants generally perceived this preliminary research framework as useful for informing researchers and improving research knowledge with positive ratings in most survey items. Specifically, participants indicated that they would suggest the framework to their students (item 6) for research support purposes (item 7) and for use as a teaching tool (item 8) (Figures 8-10, Appendix 2). This could address the apparent lack of growth in research skills of undergraduate psychology students (Balloo, Pauli, & Worrell, 2016) as well as PhD students (Wiles, Durrant, De Broe, & Powell, 2009)

and PhD students (Wiles, Durrant, De Broe, & Powell, 2009). Knowledge of research processes and methodologies is part of assessing journal article quality and, consequently, plays a role in promoting academic careers and journal standards (Albers, Floyd, Fuhrmann, & Martínez, 2011). The ability of the framework to address aspects of publication such as improved reporting of research processes (item 2) and enhancing publications (item 3) was also found to be potentially useful (Figures 4-5, Appendix 2). Despite the high frequency of positive ratings for the framework, the participants showed little willingness to apply the framework in their own research (item 5) (Figure 7, Appendix 2). A possible explanation for this could be that the sample included expert researchers with sufficient research knowledge, but an appreciation and support for the educational value of the framework. However, further investigation is necessary to determine reasons for this rating.

Limitations and Recommendations

The limitations encountered in phase 1 of the study (development of the research framework) was the lack of rigour in the reporting of research methodologies in publications in the database, as indicated by Scholtz et al. (2019). It is recommended that further data should be collected in accordance to the process followed in Scholtz et al. (2019) using an interpretive review method to gain detailed steps in the research process thereby possibly broadening the research framework. Despite this limitation, the data allowed for representation of the fluidity in method application and lack of rigour in certain areas of the research process. This in itself provided knowledge and insight into the use of research methods in publications and could assist in addressing the replication crisis in psychology.

Furthermore, a technical limitation of the framework was that 2% of the articles included more than one method in a single article, which caused the methodologies to become intertwined in the creation of the framework. Future research should take note of

this phenomenon and use a more refined logging system for articles. However, 2% is very low and further highlights how researchers combine methods by conducting more than one separate study in a single article. Lastly, the framework was based on articles published from a sample of five international, SCImago-ranked journals. This may have biased the framework towards content published in these articles. Future research should compare data from a broader sample.

The first limitation encountered in phase 2 was the small sample size, which was due to non-response and incomplete surveys. Non-response is a growing trend in survey research and can occur for various reasons (See Cowles & Nelson, 2015). Unfortunately, it may also promote bias as a large section of the sample's opinions are not included in the results (Cowles & Nelson, 2015). However, it should be reiterated that the aim of this study was to conduct only a small evaluation as per the first step in the process of evaluation studies (Rossi et al., 2011). Although the sample was still used for this article, a larger sample obtained via a different data-collection method is recommended for further development of the research framework. In addition, students should be included as participants, as they are academics in the making and participants indicated the framework highly relevant for student researchers. A qualitative section for comments from participants should also be included in future studies. This would especially have been helpful in the case of item 5, which had received a low rating (Table 1, Appendix 1). Considering these limitations, the authors believe that further investigation and adjustments to the review techniques could improve the framework to include a clearer and broader range of research processes. Research may not always be perfect, but each bit of new information gained from studies contributes to our legacy of knowledge for young researchers (Salkind, 2012).

Conclusion

It is concluded that the online research framework named Method Garden was perceived as having some positive usefulness with regards to method use in psychology and forms a valuable first step in the development of a data-generated research framework. The framework highlighted the research processes, applications, and terminology followed in psychological research. Method Garden is also considered as having potential usefulness in promoting insight and knowledge into research methods, especially when using the framework as a tool for supporting student researchers and publications. Results and limitations highlighted over the course of this study should be considered for further development of the research framework.

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Appendix 1

Table 1

Descriptive statistics

Scale items (Survey questions)	Valid	Missing	Mean	Median	Std. Deviation	MAD Robust	IQR	Minimum	Maximum	25th percentile	50th percentile	75th percentile
1.The research framework provides clarity on the application of research methods in psychology	8	0	3.625	4.000	0.916	0.741	1.000	2.000	5.000	3.000	4.000	4.000
2. The research framework can be used to increase the reporting of research processes in publications	8	0	3.750	4.000	1.035	1.483	1.250	2.000	5.000	3.000	4.000	4.250
3. The application of the research framework can improve/increase research outcomes (publications).	8	0	3.375	3.500	1.061	0.741	1.250	2.000	5.000	2.750	3.500	4.000
4. The research framework may be used to improve research skills	8	0	3.375	3.500	0.744	0.741	1.000	2.000	4.000	3.000	3.500	4.000
5. I will use the research framework in my research	8	0	2.625	2.500	0.744	0.741	1.000	2.000	4.000	2.000	2.500	3.000
6. I will suggest this research framework to my students	8	0	4.125	4.000	0.641	0.000	0.250	3.000	5.000	4.000	4.000	4.250
7. The research framework can assist students in their research	8	0	4.375	4.500	0.744	0.741	1.000	3.000	5.000	4.000	4.500	5.000
8. The research framework can be used as a tool in teaching	8	0	4.125	4.000	0.641	0.000	0.250	3.000	5.000	4.000	4.000	4.250
9. The research framework can assist researchers in employing research methods	8	0	3.750	4.000	0.463	0.000	0.250	3.000	4.000	3.750	4.000	4.000

Scale items (Survey questions)	Valid	Missing	Mean	Median	Std. Deviation	MAD Robust	IQR	Minimum	Maximum	25th percentile	50th percentile	75th percentile
10. The research framework can be used to increase exposure to different research topics	8	0	4.000	4.000	0.535	0.000	0.000	3.000	5.000	4.000	4.000	4.000
11. The research framework can be used to increase exposure to different research methods	8	0	3.875	4.000	0.641	0.000	0.250	3.000	5.000	3.750	4.000	4.000
12. The sampling section informed me on different types of sampling methods	8	0	3.625	4.000	0.916	0.741	1.000	2.000	5.000	3.000	4.000	4.000
13. The framework provides a good indication of how to conduct certain research methods	8	0	3.375	3.500	1.061	0.741	1.250	2.000	5.000	2.750	3.500	4.000
14. The framework informed me on different types of research topics available in the field of psychology	8	0	4.125	4.000	0.991	0.741	1.000	2.000	5.000	4.000	4.000	5.000
15. The framework informs on the type of research designs that are used for certain research topics in Psychology	8	0	3.750	4.000	0.886	0.000	0.250	2.000	5.000	3.750	4.000	4.000

Appendix 2

Figure 1

Study structure

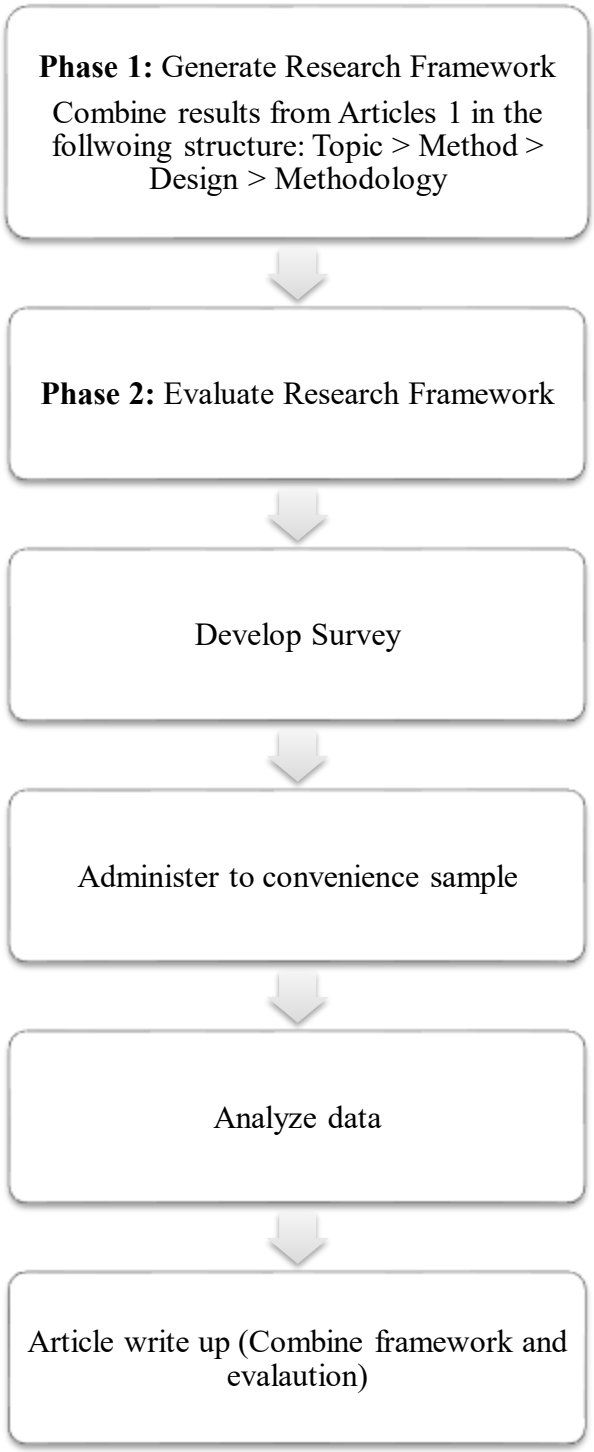


Figure 2

General research structure found in literature (Article 3)

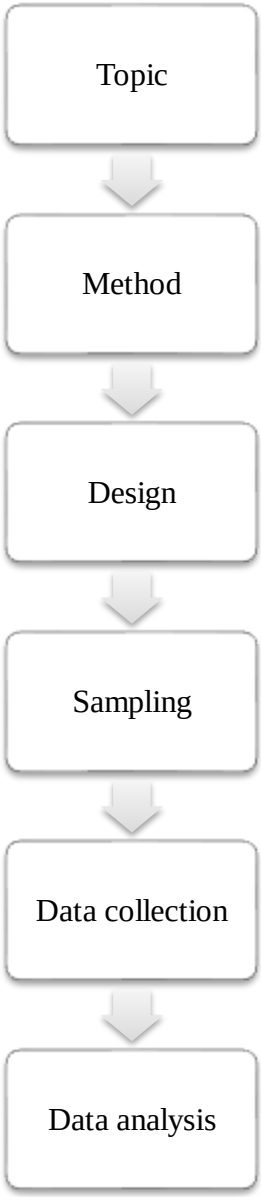


Figure 3

Item 1: The research framework provides clarity on the application of research methods in psychology

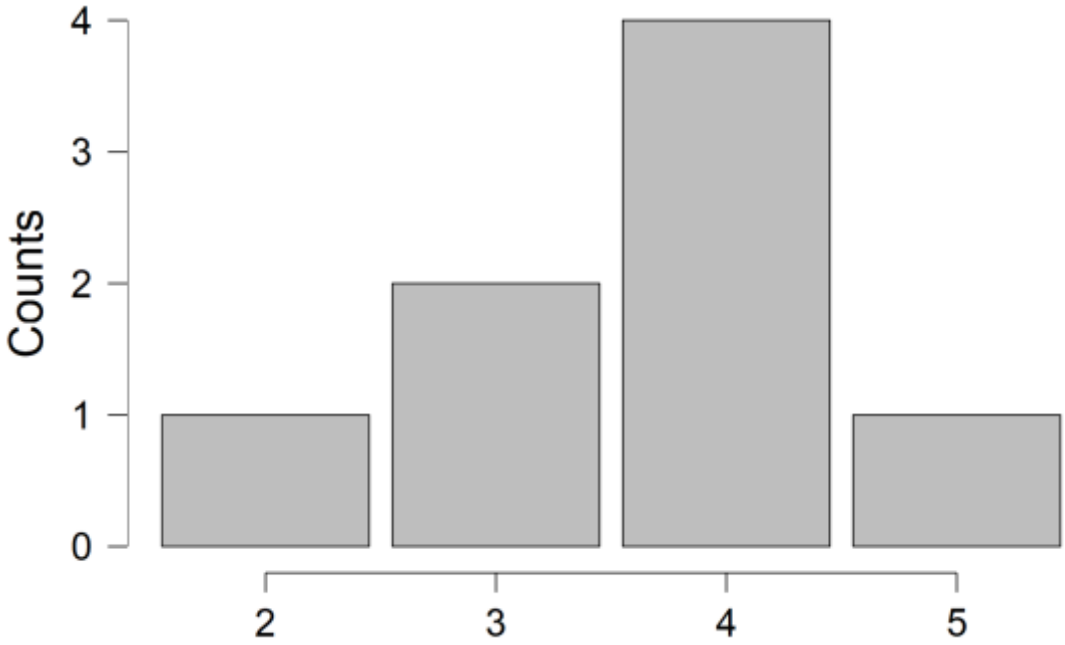


Figure 4

Item 2: The research framework can be used to increase the reporting of research processes in publications

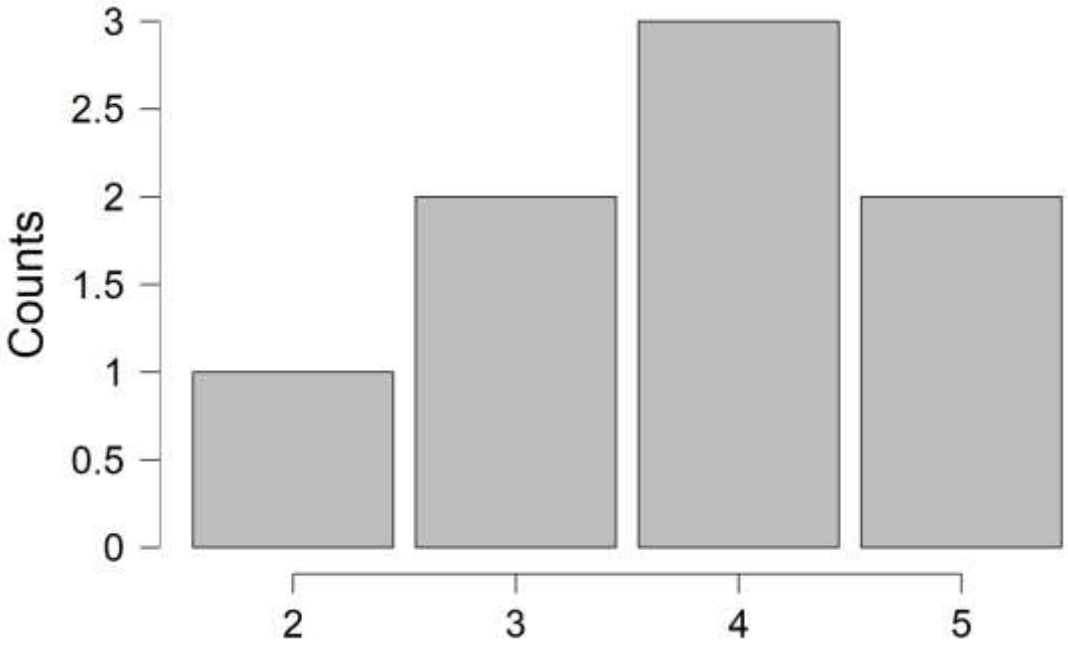


Figure 5

Item 3: The application of the research framework can improve/increase research outcomes (publications)

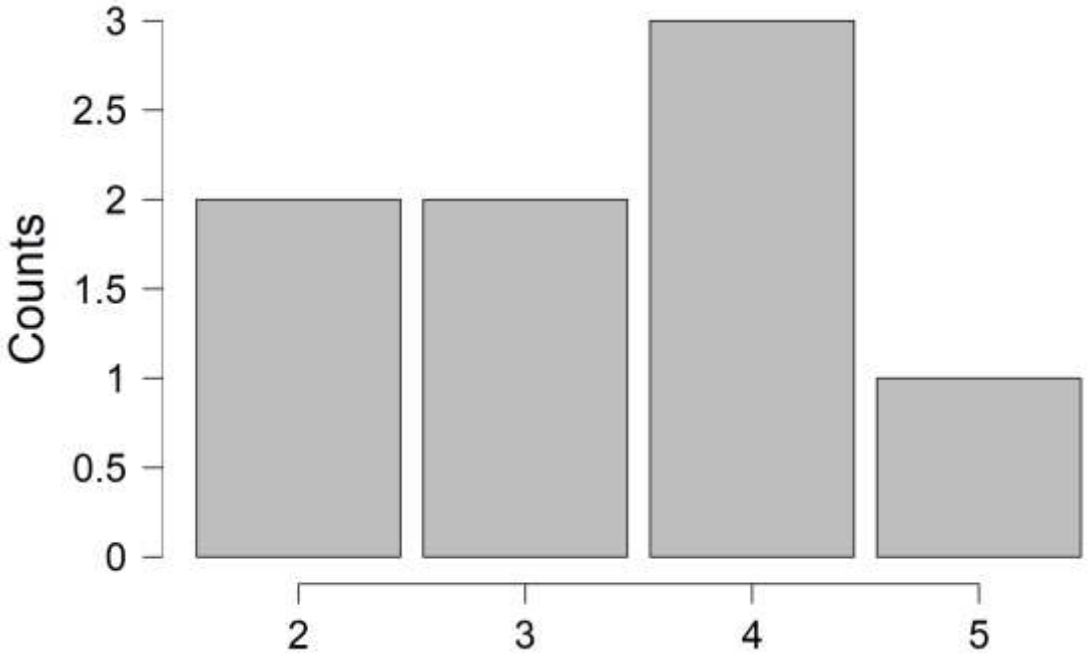


Figure 6

Item 4: The research framework may be used to improve research skills

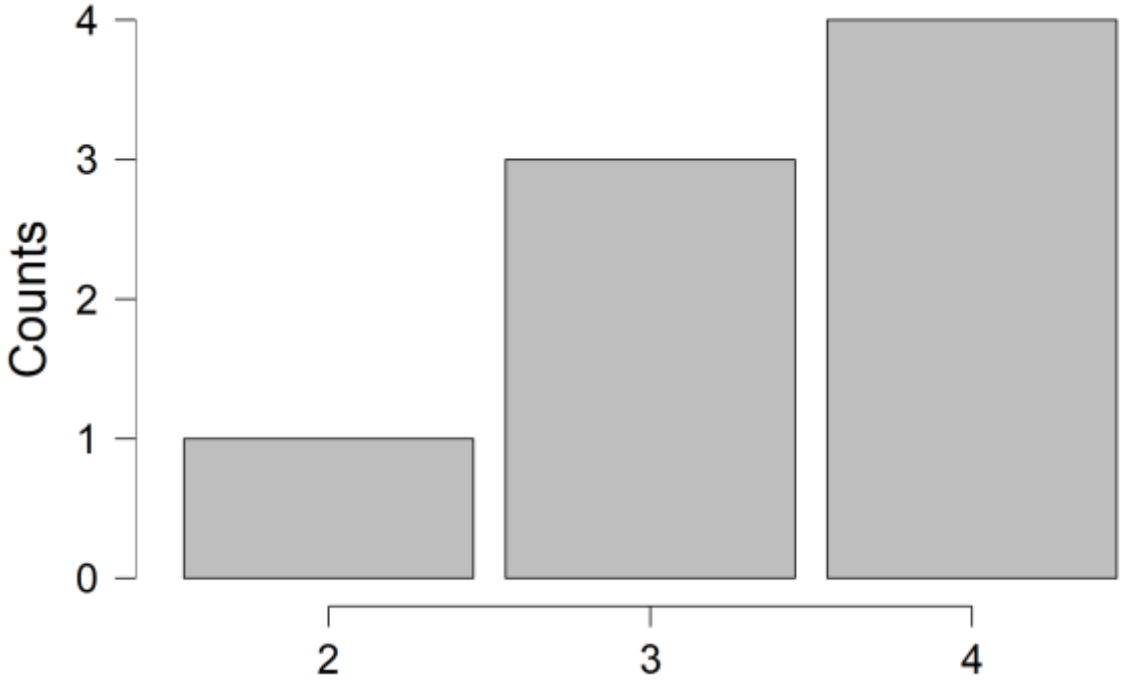


Figure 7

Item 5: I will use the research framework in my research

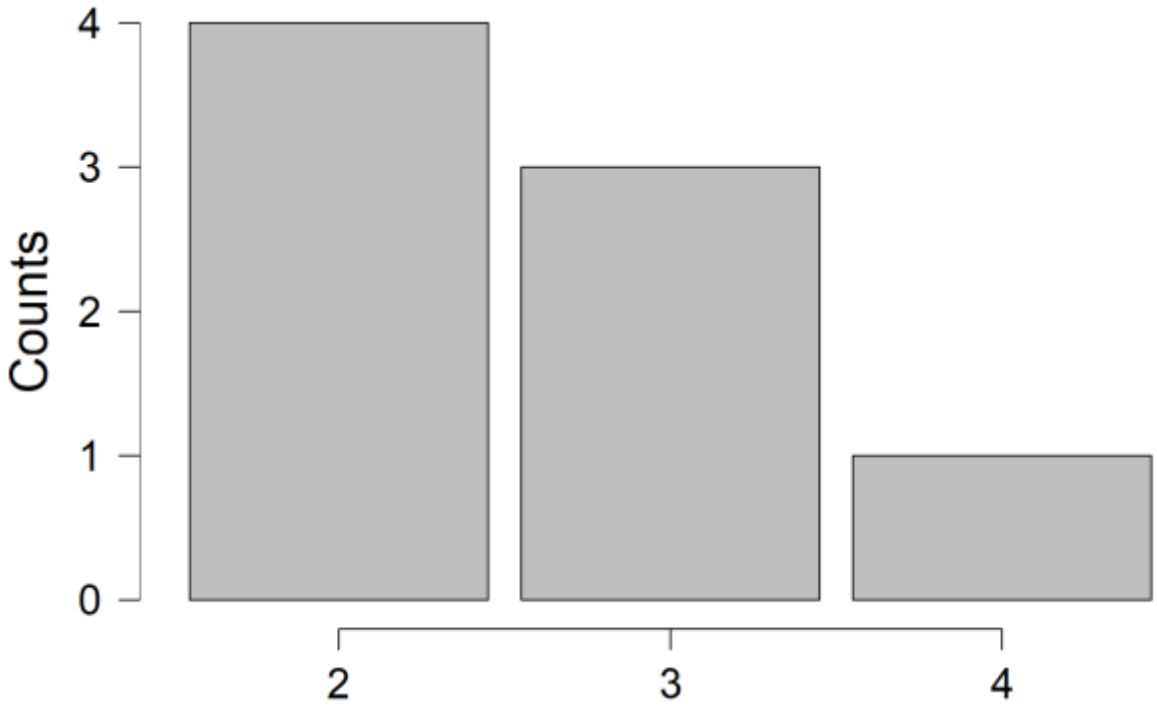


Figure 8

Item 6: I will suggest this research framework to my students

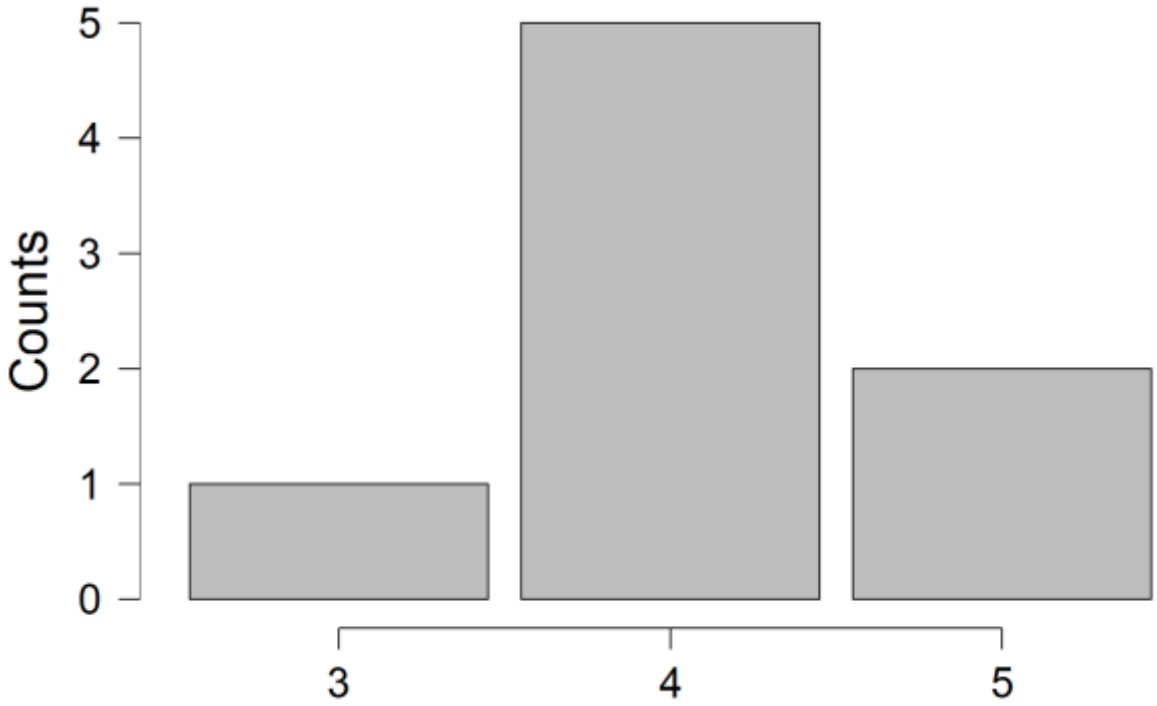


Figure 9

Item 7: The research framework can assist students in their research

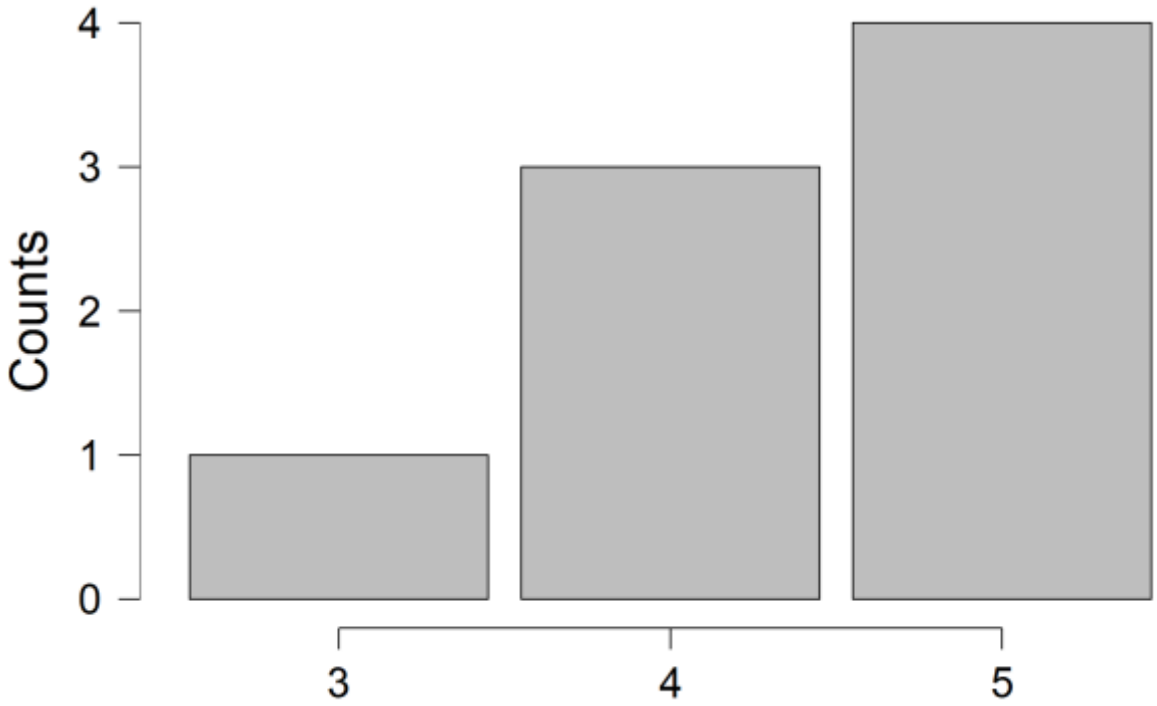


Figure 10

Item 8: The research framework can be used as a tool in teaching

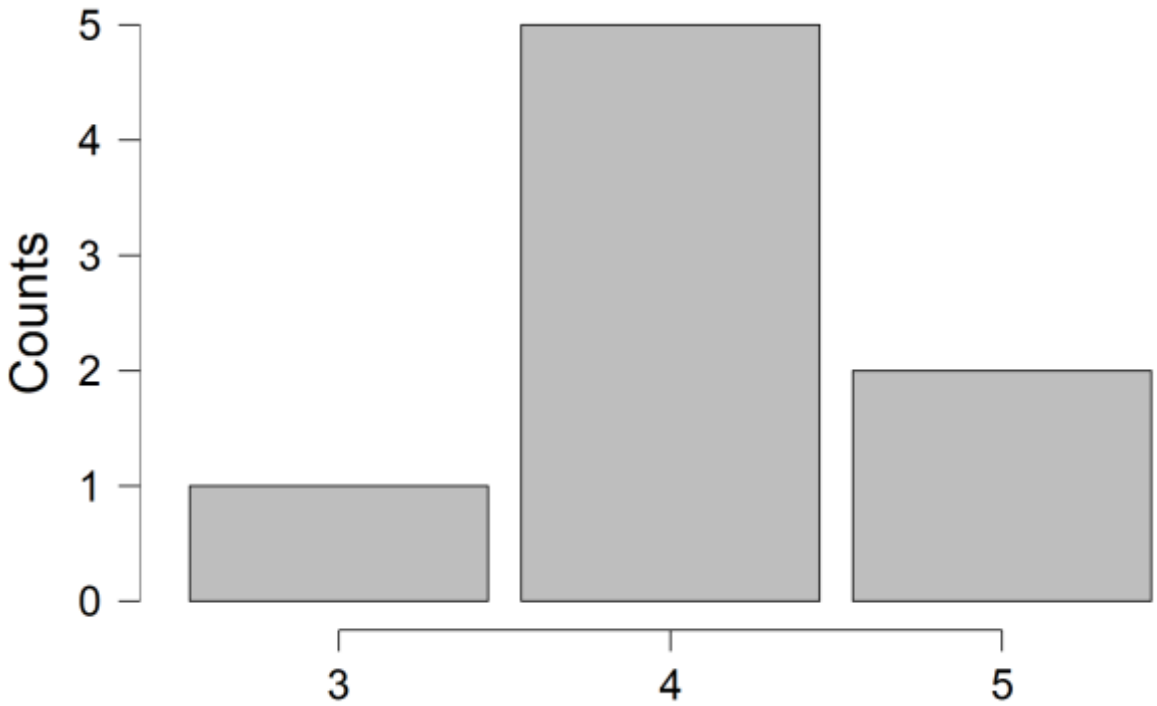


Figure 11

Item 9: The research framework can assist researchers in employing research methods

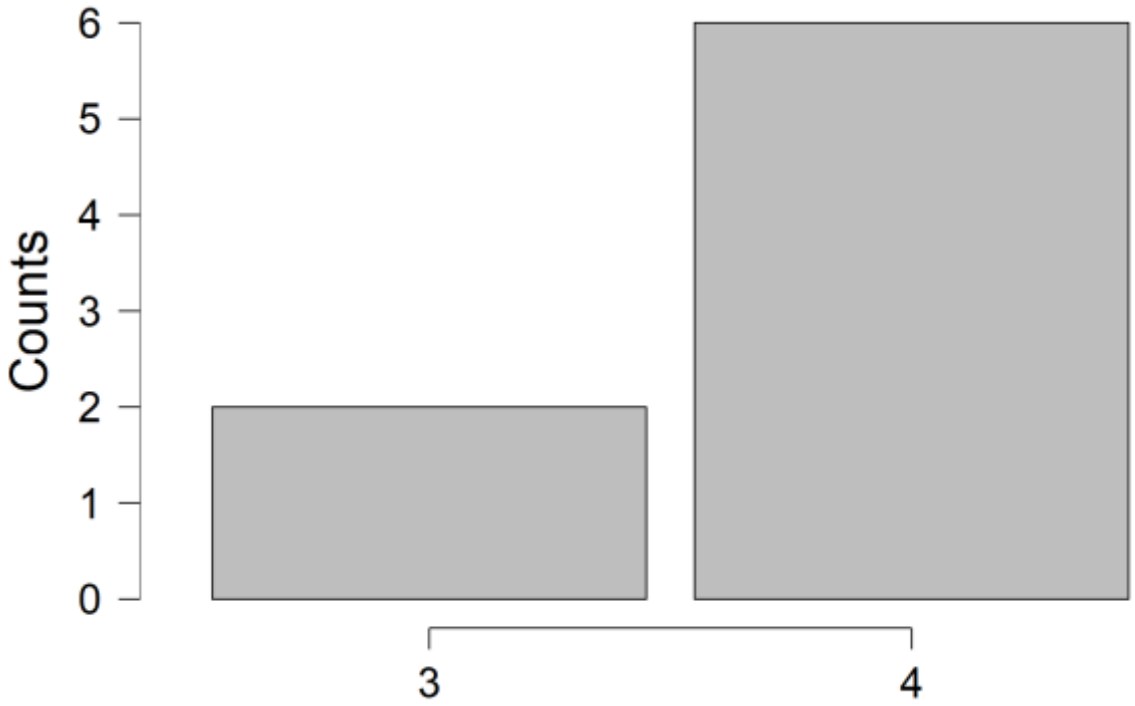


Figure 12

Item 10: The research framework can be used to increase exposure to different research topics

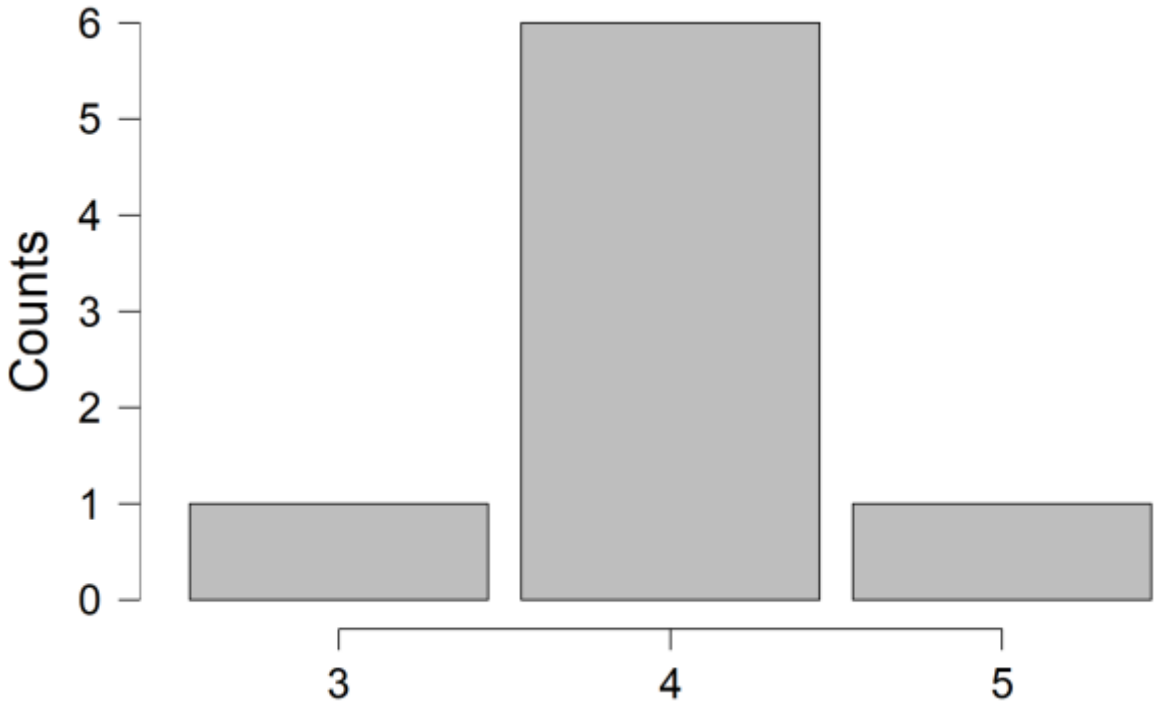


Figure 13

Item 11: The research framework can be used to increase exposure to different research methods

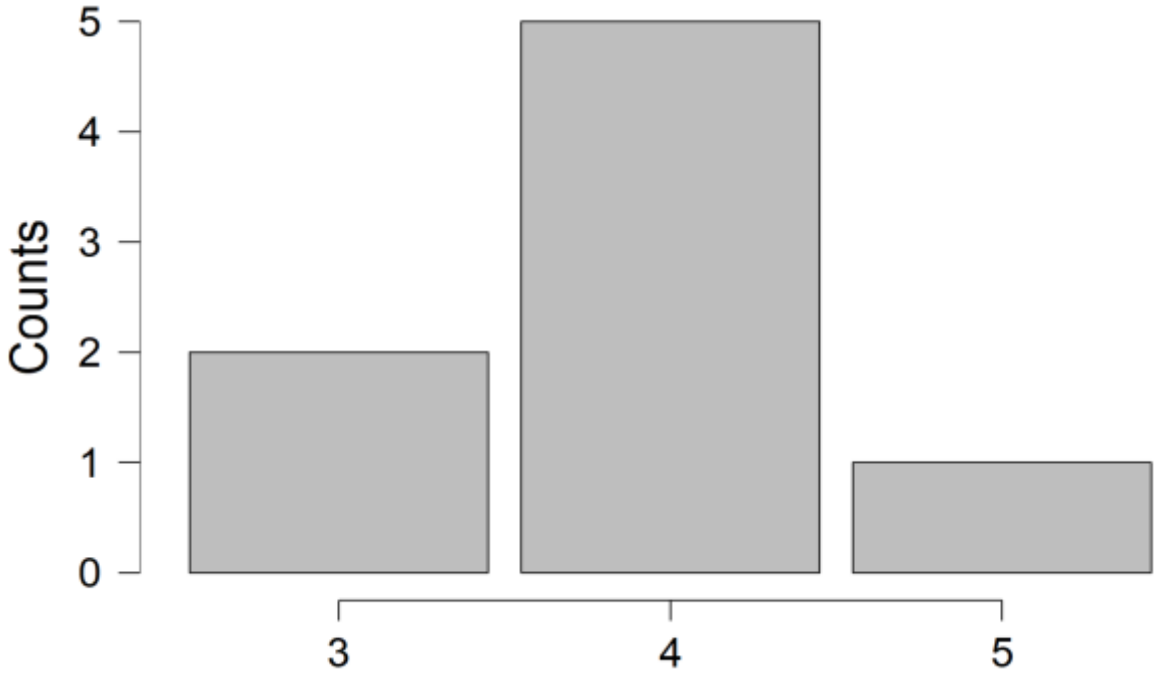


Figure 14

Item 12: The sampling section informed me on different types of sampling methods

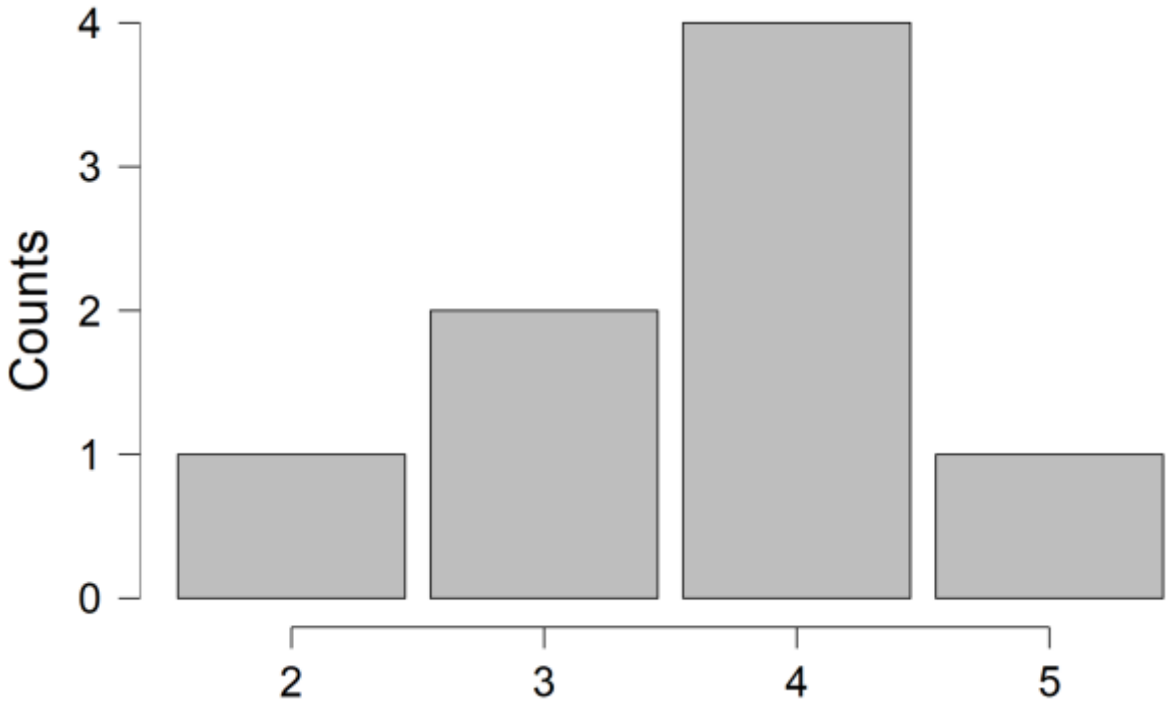


Figure 15

Item 13: The framework provides a good indication of how to conduct certain research methods

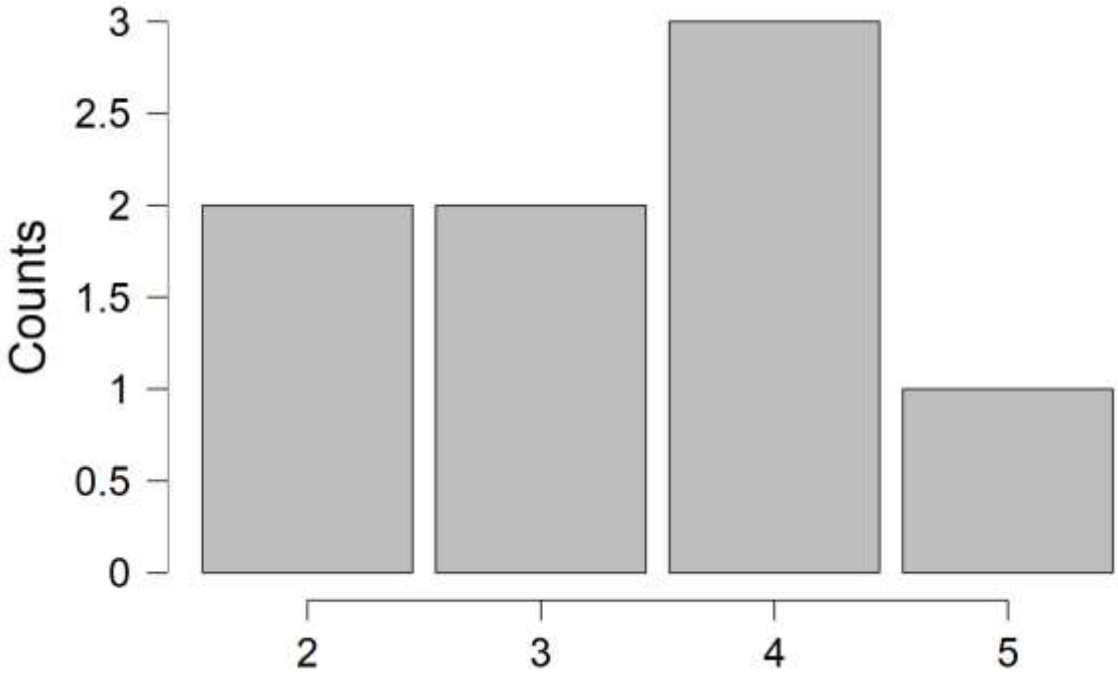


Figure 16

Item 14: The framework informed me on different types of research topics available in the field of psychology

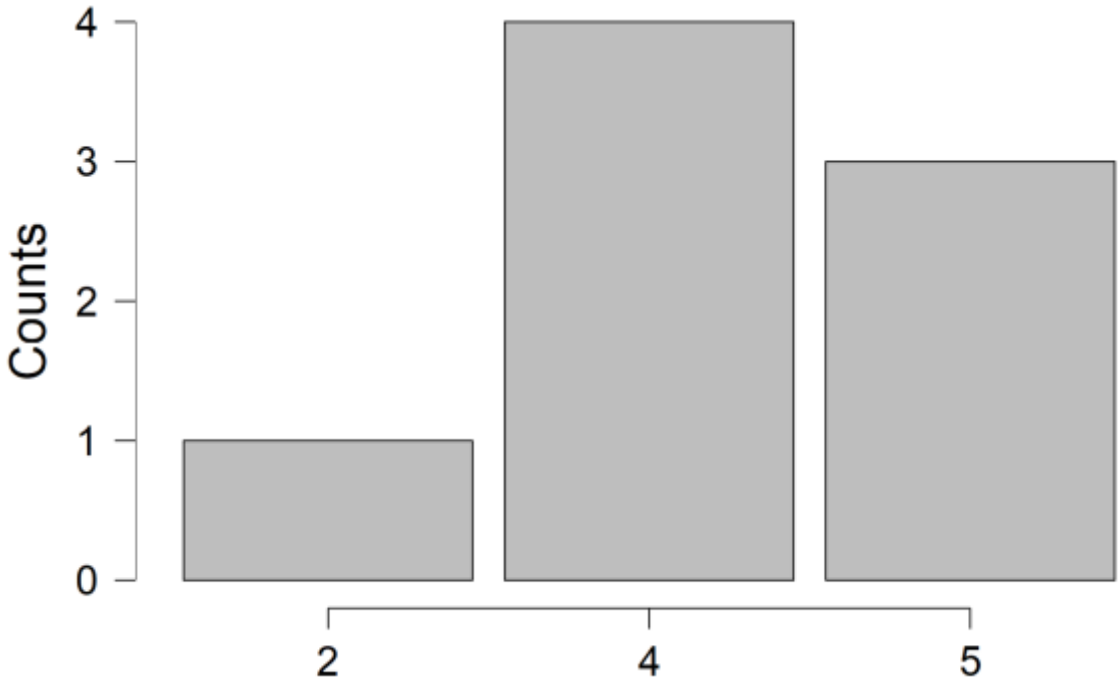
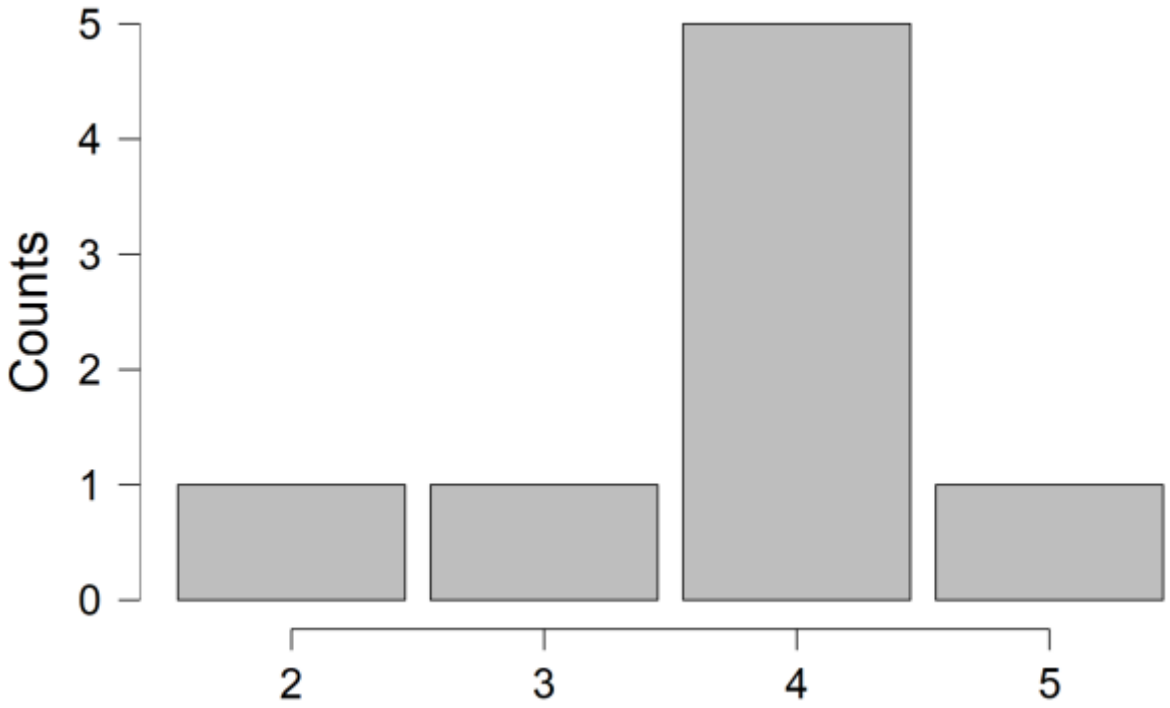


Figure 17

Item 15: The framework informs on the type of research designs that are used for certain research topics in Psychology



Appendix 3

Online survey

Please indicate to what extent you agree or disagree to the following statements:

Likert scale included after each statement

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

(1) The research framework provides clarity on the application of research methods in psychology

(2) The research framework can be used to increase the reporting of research processes in publications

(3) The application of the research framework can improve/increase research outcomes (publications)

(4) The research framework may be used to improve research skills

(5) I will use the research framework in my research

(6) I will suggest this research framework to my students

(7) The research framework can assist students in their research

(8) The research framework can be used as a tool in teaching

(9) The research framework can assist researchers in employing research methods

(10) The research framework can be used to increase exposure to different research topics

(11) The research framework can be used to increase exposure to different research methods

(12) The sampling section informed me on different types of sampling methods

(13) The framework provides a good indication of how to conduct certain research methods

(14) The framework informed me on different types of research topics available in the field of psychology

(15) The framework informs on the type of research designs that are used for certain research topics in Psychology

CHAPTER 6 CONCLUSION, SUMMARY AND RECOMMENDATIONS

In this chapter of the PhD research study, the following aspects are summarized and reflected on: rationale for study, research objectives and conclusions, contribution to knowledge, limitations, recommendations, and the researcher's own view of the research topic and process. The aspects of the current chapter are based on the results from the three articles in Chapters 3 to 5, and aim to reflect on and round off the thesis.

Rationale for Study

This PhD research study explored the use of research methods in psychological research. Psychological research is an important tool for learning about and addressing social issues (Dweck, 2017). However, literature indicates that the research skills in this field are lacking (Nind, Kilburn, & Wiles, 2015). A scarcity of research skills debilitates the quality of research outputs and the acceptance thereof in the academic community (Ketchen, Boyd, & Bergh, 2008). This lack of skills can be seen in the experiences of lecturers and supervisors (Earley, 2014; Scott Jones & Goldring, 2015), reviewers (Levitt et al., 2017), journal publications (Ezeh et al. 2010), and in the application, teaching or reviewing of research methods. A key aspect of applying research is clarity and competence in the application of research methods (see Davis, Evans, & Hickey, 2006; Hyland, 2016; Ngulube, 2013; Tan, 2007; Waite & Davis, 2006). Therefore, this PhD research study sought to gain insight into the application of research methods by answering the following research questions: *What research methods do researchers from different fields of psychology use? Why do they use these methods, and how do they employ these methods?* In order to answer these questions, three objectives were addressed in the form of three articles. This chapter revisits these objectives by summarizing each article with its key results.

Research Objectives: Summary of Results and Conclusions

Article 1 (objective 1): *Critically review international articles from the field of psychological research to determine what research methods are being used, how these methods are being used, and for what topics.* The results indicated that five methods were typically used to conduct research, with quantitative research methods being vastly more popular than all other methods from this international sample of journals. Surprisingly, reviews surpassed that of mixed methods and multi-methods. Of the 13 sampling types identified (See table 3, Appendix 1, Chapter 3), the results showed the majority of articles making use of convenience sampling. Design frequencies concurred with the high number of quantitative studies conducted via experimental and cross-sectional designs. However, all reported designs (36 designs) were categorized and included for the various research methods, for example, ethnography and Interpretative Phenomenological Analysis for qualitative methods (See table 4, Appendix 1. Chapter 3). Of the 30 data collection methods stated, questionnaires were most often used; more than half of the articles employed this method (See table 5, Appendix 1, Chapter 3). Data analyses included 188 methods and consisted of modern and traditional statistical techniques (See table 6, Appendix 1, Chapter 3). Thematic analysis or forms of coding and theme creation was also applied for qualitative studies along with categorization for reviews. The research methods were applied for ten broad research topics, which concurred with the nine fields of research indicated by Weiten (2010) and (See Table 1, Appendix 1, Chapter 3). These topics were used to answer *Why certain methods are being applied*. Psychological practice, a research topic that was not part of those identified by Weiten (2010), was added by the researcher to include articles that focussed on psychology as profession, such as professional training and experiences in practice. Social psychology was the most popular research topic.

The concluding remarks from this objective highlighted (visually presented) the research processes followed and certain research trends. It was found that quantitative research methods and the broad research topic of social psychology were pursued above other topics, albeit to varying degrees. With regards to How research methods are applied, method application was also discovered to occur more fluidly than expected, while research boundaries were regularly crossed, e.g., including qualitative research methodologies in quantitative studies. Lastly, and based on reporting, it was concluded that researchers often lacked transparency in referring to the methodologies they followed in their research.

Article 2 (objective 2): *Critically review articles from the South African Journal of Psychology (SAJP) to determine what research methods are being used, how these methods are being used, and for what topics.* SAJP was originally included in the sample that formed part of the objective pursued in Article 1. However, separating the SAJP from Article 1 allowed for an in-depth South African perspective on the use of research methods in psychology. The benefits of this separation is clear when comparing the results of Articles 1 and 2. This amendment was also deemed appropriate, as the study was conducted by using South African resources; the authors hoped to grow and return the investment provided by South African institutions in the form of this article. The authors also believed this to be a pragmatic solution, as the inclusion of a journal (SAJP) listed below the sampled top ranked international journals (Article 1) could have skewed the results.

Results for this objective (Article 2) indicated that researchers were also more prone to employing quantitative research methods; however, qualitative methods were found to be more popular in this sample, differing by only 19,05% from quantitative methods compared to the 85.43% difference between quantitative and qualitative methods found in Article 1 (Table 2, Chapter 4). The remainder of the studies employed reviews or mixed method studies, with no multi-method studies. Of the 11 sampling methods reported, sampling

concurred with Article 1, with researchers more prone to using samples of convenience when conducting studies (Table 3, Chapter 4). Experimental designs were applied less often than in Article 1, whilst cross-sectional designs and quasi-experimental designs were the most popular (Table 4, Chapter 4). Qualitative studies applied narrative designs and phenomenological designs, whilst mixed-method studies were clear on the use of exploratory designs and reviews on systematic and narrative designs. Questionnaires were also the most frequently used method of data collection, although various types of interviews were also popular (Table 5, Chapter 4). A high number of statistical methods, such as descriptive statistics, were used for data analysis with thematic analysis still being the method of choice when working with qualitative data (Table 6, Chapter 4). Lastly, the researchers also found a lack of clear reporting in terms of the research methodology applied.

The same research topics were identified as for Article 1, with social psychology the most popular research topic. However, the frequencies showed researchers from the SAJP sample favoured publishing on psychological practice, a result that differed significantly from that of Article 1.

The broad conclusion that could be drawn from Article 2 was that the context of the research plays a role in the selection of research method. This is evident from the different frequencies of the chosen research methods and research topics. Finally, this journal sample also displayed a lack of transparency in terms of the methodology selected.

Article 3 (objective 3): *Formulate a research framework based on data from objective 1 on how to choose a research method and what process to follow in conducting that method.* Two phases were employed to achieve objective 3. Phase 1 used data from Article 1 to develop the resulting research framework, named Method Garden (https://methodgarden.xtrapolate.io/) that was presented online as a way to reach participants and facilitate ease of use. The following aspects of the framework are worth noting: firstly,

'not stated' methodologies were included in the research process to avoid biased perceptions of how researchers conduct research, and to allow researchers to choose how they conduct research in reality. Secondly, the studies that crossed methodological boundaries were not separated, which kept the framework based on the reality of method use in publications. Lastly, a technical error was noted in the article: 2% of articles included more than one study that utilised different methods. The authors believe that the objective for Article 3 was achieved through the presented research framework, as it shows how to choose a research method by allowing the researcher to select the research topic and then indicating the steps to be followed for the remainder of the research process.

In phase 2, the usefulness of the framework was evaluated by 8 key informants via an online quantitative survey (Table 1, Appendix 1, Figure 3-17, Appendix 2). Participants generally perceived the framework as being a potential source of research knowledge and insight, especially with regard to its relevance for student researchers. However, the participants were not willing to apply the framework to their own research. As this was the first evaluation of a preliminary framework that was subject to limitations such as the small sample of evaluators, the authors concluded that this study should serve as a valuable first step for further development and research into a data-generated research framework. Furthermore, the lack of rigour – as in the case of "not stated" methodologies – did make it difficult to present a detailed research framework.

Contribution to Knowledge

To the best of our knowledge, this is the first research study to address the topic of research methods in psychology through a systematised review design from the perspective of two different contexts (Article 1 [international journals] & Article 2 [national journal]) over a period of five years. This is also the only research study that has created an online data-generated and evaluated research framework based solely on journal publications

(Article 3). Each article presented unique contributions to the field of psychology, which is discussed later in this section. In general, however, this PhD research study addresses a central issue in the field of psychology, which is the replicability crisis (Earp & Trafimow, 2015). This can be seen in the lack of transparency and rigour found in both journal samples and highlighted by the research framework.

Scientific credibility, evidence, and funding in the field of psychology is currently being questioned (Fanelli, 2018; Yong, 2017). The reason for the focus on replication is the high level of doubt in research findings (Pashler & Wagenmakers, 2012) and the general limited number of replicability studies (Earp & Trafimow, 2015). Replication is seen as the "coin of the scientific realm" (Loscalzo, 2012, p.1211) and is the cornerstone of scientific credibility (Makel, Plucker, & Hegarty, 2012). Replicability further promotes trust between the public and the field, which is important considering the role of psychology in providing advice to policy-makers (Bromme & Thomm, 2016), improving societal outcomes (Ruggeri et al., 2019), and the need for funding and sample participation (Wingen, Berkessel, & Englich, 2019) to advance the field.

Tackett et al. (2017) as well as Tackett, Brandes, King and Markon (2019) identified methodological and statistical differences as influencers of replication problems and highlighted that, until this aspect has been examined, it remains an empirical question that should be answered. Results from this thesis study contributed to this examination in the following ways:

Firstly, this PhD research study has provided evidence and shown areas of lack of rigour and transparency in reporting research methodologies, thereby indicating possible replication issues in ten broad topics of psychology. Wingen et al. (2019) identified transparency as one of the approaches to improve public trust in psychological results and improve replicability which includes openness about data and the materials used (Miguel et

al., 2014; Nosek et al., 2015). Earp and Trafimow (2015) also list strict adherence to the method of the original study as the first step in replication. The results of this PhD research study show that following the methodology of the original study may lead to the replication of studies by using different or incorrect methodologies, as these details are often omitted.

Secondly, this PhD research study provided an online list of 999 research articles categorized according to topic and methodology. This list may serve as a basis for assisting researchers to more precisely replicate the methodology of a study, as slight differences in methodologies could impact replication results (Tackett et al., 2019). This may especially be helpful in identifying articles where method boundaries were crossed, or methodologies were deviated from.

Thirdly, this list of articles may also provide an easy-to-use system to help identify possible opportunities for replication studies, a dire need of the field of psychology (Tackett et al., 2019) by providing researchers a categorised database of articles. Despite the uproar over replicability, transparency and method improvement, subfields such as clinical psychology has only slowly started to engage with the replication movement (Tackett et al., 2019). The hope, therefore, is that the articles and research framework presented would assist in this movement.

Fourthly, this PhD research study provided insight into method use (Articles 1 & 2), and created a preliminary research framework (Article 3) to assist in method application and knowledge acquisition, thereby contributing to the improvement of methodological standards that are essential for promoting replicability in psychology (Cook, Lloyd, Mellor, Nosek, & Therrien, 2018; Van Bavel, Mende-Siedlecki, Brady, & Reinero, 2016). According to Wingen et al. (2019), the current mistrust in psychological findings will not continue to future researchers if they are trained under rigorous methodological guidelines.

Lastly, an aspect that further influences replicability and scientific trustworthiness is publication bias, where journals are biased towards certain methods and research topics (Tackett et al., 2019). This PhD research study provides evidence for this bias, and shows the frequency of use for all aspects of the research process, including research topic preferences in a sample of international and national journals.

This PhD research study's contribution to addressing the replication crisis is highlighted, as replicability is not only important in supporting the findings of previous studies but also protects the reputation of psychology as a scientific field (Wingen et al., 2019). The separate contributions of the three articles are mentioned below.

In terms of **Article 1,** knowledge was gained by providing in-depth, topic-specific detailed accounts of the research methodologies of articles in five international journals. A topic (research methodologies) that is often superficially or partly investigated for example Macleod and Howell (2013), especially with regard to data analysis. Additionally, the frequencies of research trends from 2013- 2017 were identified. These trends provided information on the popularity of research methods, how they are employed, and the current social issues explored. Researchers who wish to publish in the sampled journals are also informed of these journals' preferred topics and methods.

Article 2 provided a database to show the impact of context on research culture. The comparison between a sample of international journals and a local journal based on the same research aims is unique, and also provided new insights into research trends. Research processes of articles in SAJP were traced and trends in the research topics were identified. Results from this study also provided researchers with the opportunity to reflect on whether research from this sample truly targeted psychological needs in South Africa.

Lastly, **Article 3** created a preliminary research framework based entirely on data. Which is, to our knowledge, a unique contribution to the field. The potential value of such a

research framework for students was explored and the limitations identified will become a point of departure for further development. The exact wording used in the sample (Article 1) was also used in this framework and could be used for future research as a representation of research vocabulary.

Limitations

As with all research, there were some limitations to this PhD research study. The authors applied a systematised review design for Articles 1 and 2. Although this design was found to be appropriate and useful for the identified research objectives, it was a lesser known review design upon commencement of this study. Therefore, the researchers improved rigor by providing a visual representation of the research processes followed for Articles 1 and 2 on the basis of previous published studies. The student regularly consulted with her supervisors throughout the research process. The collected data amassed a vast number of articles, which were categorized with Microsoft Excel worksheets and an online system purposely designed for the articles included in the Method Garden framework. Co-coding was also applied to limit reporting errors. The study aimed explicitly to include *reported* steps of the research methodology; however, due to the lack of rigour in the sample articles, it may be possible that methods other than those declared were applied in the studies. This aim did, however, allow for the representation of information not clearly stated in articles, and promotes the rationale of this PhD research study, as it detracts from the accuracy required for replication. Lastly, data should be considered in the context of the included samples especially with regards to bias and generalizability.

The framework of Article 3 was based on the data collected in Article 1, which lead to the following limitations: *firstly* "not stated" had to be included as it formed part of the research process. *Secondly,* some articles included more than one study per article, which did not interfere with the data for Article 1 as the research steps were deconstructed and

categorized separately. These steps had to be reconnected in Article 3 and caused the methods from the different studies to become intertwined. However, this only occurred in a small percentage (2%) of articles. Thirdly, data from Article 1 only focused on five international journals, which makes the framework biased towards the methods applied in those journals. Furthermore, phase 2 of Article 3 – the evaluation study – was affected by non-responses, which resulted in only 8 research experts evaluating the framework. However, no further sampling was conducted, as this was only the first step of a preliminary research framework to be administered to a small sample as per evaluation study designs. Data collected from this small sample should therefore serve as indication for further development. The lack of a qualitative section for participant feedback also limited the study to some extent.

Recommendations

Based on the conclusions and limitations of **Article 1 and 2**, it is recommended that future research employ an interpretive review design to include methodology not stated outright in articles. One way to pursue this is to follow definitions of methodological aspects to facilitate their identification in articles and categorize these articles through an appropriate review tool. Further studies could pursue the same objectives by including a broader sample of journals to account for the influence of context.

The use of the systematised review design is encouraged for further review studies to improve its rigour and popularity, as it provided an easy and practical method for categorizing data.

With regard to the results of Articles 1 and 2, future research could investigate why certain research methods are employed more frequently than others, as well as why research methodologies are inadequately reported in research articles. The implications of this should

be further investigated, as should the educational value of these articles to novice researchers, students, and its role in the growth of research methods as a whole.

Further research into the topic of **Article 2** should focus on creatively addressing the disadvantages of continuously applying the most common sampling method, convenience sampling, in the South African research culture. Furthermore, it is also recommended that transparency is improved in terms of methods applied, especially since the South African sample was keen on applying qualitative methods. Transparency could promote the trustworthiness of qualitative methods in psychology and replication studies. This is an important recommendation, as it is argued that the applicability of statistical methods from the global north are inappropriate for the context of the global south. Despite this recommendation, it is also suggested that the decline in quantitative research should be investigated, especially due to the high number of quantitative studies in Article 1 and the need for South African research to be competitive and contribute to the global knowledge economy. Lastly, with regard to the researched topics in the SAJP, it is recommended that the topics explored in psychology should be realigned with the needs of the South African public. This is apparent in the high number of articles that focus on psychological practice, with significantly few exploring education and learning topics.

Additionally, it is acknowledged that the amendments made to the original second article did remove the opportunity for more in-depth information into *Why and How* researchers employ certain methods. Asking researchers these questions as originally planned could have provided different information on method use such as paradigms, method exposure and training, for example. However, research seldom follows a linear path and due to non-response this change was necessary. Future research is therefore encouraged to address these questions from the perspective of researchers.

Based on the limitations and conclusions of **Article 3,** it is recommended that the sample of journal articles included in phase 1 of Article 1 be increased to address data bias in the development of the framework. By including a larger sample, future research could focus on broadening the online research framework to provide insight into the use of more methods, such as qualitative methods and mixed methods. Furthermore, a finer categorization system should be designed for articles to separate those that employed more than one method, as it may yield interesting and productive results. An exploration of the frequency of combined methods in research studies could also be an interesting topic for future research. For phase 2 of this article, a larger sample of evaluators that include both students and research experts should be used to evaluate the Method Garden framework. These evaluation surveys should also include qualitative questions for comments. The results of article 3 is recommended to serve as a basis for further development of the Method Garden.

With regard to the overall feasibility of the research study for a doctorate, it is recommended that similar structured studies – especially with extensive literature reviews – should either employ assistance or consider dividing the collected data into more than one article. This way, students can fully utilise the amount of effort and time spent in collecting the data and promote effective time management. Although thorough research was conducted in this thesis, future students are encouraged to attempt to replicate results or incorporate the recommendations to perform similar studies as a way to develop the use of research methods in psychology and address the replication crisis.

Self-reflection

This PhD experience provided various learning opportunities for me as a young researcher. An aspect that I found **difficult** was the data analysis for article 1. I spent more than a year categorizing and coding the vast number of journal articles into Microsoft Excel spreadsheets. After the year of inputting the information, an online system was created, and

the information had to be transferred manually to the system. This also took a few months. This occurrence, however taxing, allowed me to correlate each article input with the original journal article before adding the article information to the online system. It reminded me that research does not progress linearly, but at times take you on a detour for the good of your project. This online data system (the detour), allowed for the creation of the online research framework. The incorporation of technology into my research taught me to consider technological solutions with regard to my data instead of following possibly outdated methods of data capturing, which proved to be less time efficient in this study. This is a piece of advice I would give to other students if it is appropriate for their studies.

Secondly, the **amendments** to the PhD research study and the fluid use of methods on the data allowed me to develop as a pragmatist. Despite the amount of time and work put into the original Article 2, I had to evaluate the study in the context of what made sense for the broader aim of my thesis. Additionally, and despite still addressing the objectives identified in the proposal, the final product of the research framework was not exactly as I had envisioned it. This experience taught me the skill of continuous re-evaluation of my actions against the broader objective instead of clinging to what was initially planned despite its low contribution.

Thirdly, my **view of research** methods and how it should be applied was expanded. I initially expected articles to follow clearly in neatly packaged set research processes, or fall distinctly into either qualitative or quantitative methods. This, according to Barnes (2012) is a fairly typical expectation of novice researchers or students; “real world research simply does not always allow for such neatly defined categories” (Barnes, 2012, p. 467). This encouraged me as a researcher to be open and proficient in all research methods in order to allow the research question to dictate the most effective way to answer questions about phenomena.

Thirdly, I was initially disappointed in the effects of the **lack of rigour** found in psychology articles in the sampled journals on the research framework, Method Garden. However, this can be remedied with further studies from different samples. In the meantime, it serves as visual indication of this lack of rigour in psychology and form the first step in the further development of Method Garden.

Fourthly, a quick online search for "**systematised review design**" shows that it has been gaining research popularity. I experienced the review design as easy to follow and it provided enough structure to reach the aim of the objective without including unnecessary review steps not relevant for my study. The application of a short quantitative survey was also effective for the aim of the objective and the final method at the end of this study. However, a section for comments should be incorporated in future evaluations.

Lastly, Despite it being almost impossible to produce entirely **unique results** (Biggam, 2011), I believe that this PhD research study provides insight into the use of research methods in psychology and highlights the extent of the replication crisis by emphasizing the severe lack of rigour in articles. I have learned a lot about method application and look forward to furthering my research on the use of research methods, for "doing science means following a model that begins with a question and ends with asking a new question" (Salkind, 2012).

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APPENDIX 1

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Health Sciences Ethics Office for Research, Training and Support

North-West University Health Research Ethics Committee (NWU-HREC)
Tel: 018-285 2291
Email: Wayne.Towers@nwu.ac.za

Dr W de Klerk
Psychology
COMPRES

21 August 2019

Dear Dr de Klerk

APPROVAL OF YOUR AMENDMENT REQUEST BY THE NORTH-WEST UNIVERSITY HEALTH RESEARCH ETHICS COMMITTEE (NWU-HREC) OF THE FACULTY OF HEALTH SCIENCES

Ethics number: NWU-00115-17-A1

Kindly use the ethics reference number provided above in all future correspondence or documents submitted to the administrative assistant of the North-West University Health Research Ethics Committee (NWU-HREC) secretariat.

Study title: A data generated research framework for the use of research methods in psychological research: A multi-method exploration

Study leader/Researcher: Dr W de Klerk

Student: S Scholtz-22308563

You are kindly informed that your amendment request (change in the methodology to be used for phase 2 of the study) to the aforementioned project has been approved. Any future amendments to the proposal or other associated documentation must be submitted to the NWU-HREC, Faculty of Health Sciences, North-West University, prior to implementing these changes. These requests should be electronically submitted to Ethics-HRECApply@nwu.ac.za, for review BEFORE approval can be provided, with a cover letter with a specific subject title indicating, "Amendment request: NWU-XXXXX-XX-XX". The letter should include the title of the approved study, the names of the researchers involved, the nature of the amendment/s being made (indicating what changes have been made as well as where they have been made), which documents have been attached and any further explanation to clarify the amendment request being submitted. The amendments made should be indicated in yellow highlight in the amended documents. The *e-mail*, to which you attach the documents that you send, should have a *specific subject line* indicating that it is an amendment request e.g. "Amendment request: NWU-XXXXX-XX-XX". This e-mail should indicate the nature of the amendment. This submission will be handled via the expedited process.

We wish you the best as you conduct your research. If you have any questions or need further assistance, please contact the Faculty of Health Sciences Ethics Office for Research, Training and Support at Ethics-HRECApply@nwu.ac.za.

Yours sincerely

Digitally signed by Wayne Towers
Date: 2019.08.21 19:55:08 +02'00'

Prof Wayne Towers
Chairperson: NWU-HREC

Digitally signed by Prof Minrie Greeff
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Date: 2019.08.23 13:18:17 +02'00'

Prof Minrie Greeff
Head of Health Sciences Ethics Office for Research, Training and Support

APPENDIX 2

Article 1 author guidelines: Frontiers in Psychology

A word template provided by Frontiers in Psychology was used to prepare Article 1for submission

(https://www.frontiersin.org/about/author-guidelines).

Frontiers in Psychology is the largest journal in its field, publishing rigorously peer-reviewed research across the psychological sciences, from clinical research to cognitive science, from perception to consciousness, from imaging studies to human factors, and from animal cognition to social psychology. Field Chief Editor Axel Cleeremans at the Free University of Brussels is supported by an outstanding Editorial Board of international researchers. This multidisciplinary open-access journal is at the forefront of disseminating and communicating scientific knowledge and impactful discoveries to researchers, academics, clinicians and the public worldwide. The journal publishes the best research across the entire field of psychology. Today, psychological science is becoming increasingly important at all levels of society, from the treatment of clinical disorders to our basic understanding of how the mind works. It is highly interdisciplinary, borrowing questions from philosophy, methods from neuroscience and insights from clinical practice - all in the goal of furthering our grasp of human nature and society, as well as our ability to develop new intervention methods.

Manuscript Requirements and Style Guide

General standards

Word Files: If working with Word please use Frontiers Word templates.

Article Type

Frontiers requires authors to carefully select the appropriate article type for their manuscript, and to comply with the article-type descriptions defined in the journal's "Article Types", which can be seen from the "For Authors" menu on any Frontiers journal page.

Summary for review articles:

- Wordcount for Review articles: 12000

- Abstract: 350 words
- Figures and Tables: 15 (Tables were submitted and figures added as supplementary material)
- Running title: 5 words

Sections

Your manuscript is organized by headings and subheadings. The section headings should be those appropriate for your field and the research itself. For Original Research Articles, it is recommended to organize your manuscript in the following sections or their equivalents for your field:

INTRODUCTION

Succinct, with no subheadings.

MATERIALS AND METHODS

This section may be divided by ***subheadings***. This section should contain sufficient detail so that when read in conjunction with cited references, all procedures can be repeated. For experiments reporting results on animal or human subject research, an ethics approval statement should be included in this section (for further information, see section Materials and Data Policies)

RESULTS

This section may be divided by subheadings. Footnotes should not be used and have to be transferred into the main text.

DISCUSSION

This section may be divided by subheadings. Discussions should cover the key findings of the study: discuss any prior art related to the subject so to place the novelty of the discovery in the appropriate context; discuss the potential short-comings and limitations on their interpretations; discuss their integration into the current understanding of the problem and how this advances the current views; speculate on the future direction of the research and freely postulate theories that could be tested in the future.

Acknowledgments

This is a short text to acknowledge the contributions of specific colleagues, institutions, or agencies that aided the efforts of the authors.

Author Contributions Statement

The Author Contributions Statement is mandatory and should represent all the authors. It can be up to several sentences long and should briefly describe the tasks of individual authors. Please list only 2 initials for each author, without full stops, but separated by commas (e.g. JC, JS). In the case of two authors with the same initials, please use their middle initial to differentiate between them (e.g. REW, RSW). The Author Contributions Statement should be included at the end of the manuscript before the References.

Conflict of Interest Statement

A Conflict of Interest Statement needs to be included at the end of the manuscript before the references. Here, the authors need to declare whether or not the submitted work was carried out in the presence of any personal, professional or financial relationships that could potentially be construed as a conflict of interest. For more information on conflicts of interest, see our Editorial Policies.

Contribution to the Field Statement

When you submit your manuscript, you will be required to briefly summarize in 200 words your manuscript's contribution to, and position in, the existing literature of your field. This should be written avoiding any technical language or non-standard acronyms. The aim should be to convey the meaning and importance of this research to a non-expert. While Frontiers evaluates articles using objective criteria, rather than impact or novelty, your statement should frame the question(s) you have addressed in your work in the context of the current body of knowledge, providing evidence that the findings - whether positive or negative - contribute to progress in your research discipline. This will assist the Chief Editors to determine whether your manuscript fits within the scope of a specialty as defined in its mission statement; a detailed statement will also facilitate the identification of the Editors and Reviewers most appropriate to evaluate your work, ultimately expediting your manuscript's initial consideration.

Example Statement on: Markram K and Markram H (2010) The Intense World Theory – a unifying theory of the neurobiology of autism. Front. Hum. Neurosci. 4:224. doi: 10.3389/fnhum.2010.00224

References

All citations in the text, figures or tables must be in the reference list and vice-versa. The references should only include articles that are published or accepted. Data sets that have been deposited to an online repository should be included in the reference list, include the version and unique identifier when available. For accepted but unpublished works use "in press" instead of page numbers. Unpublished data, submitted manuscripts, or personal communications should be cited within the text only, for the article types that allow such inclusions. Personal communications should be documented by a letter of permission. Website urls should be included as footnotes. Any inclusion of verbatim text must be contained in quotation marks and clearly reference the original source. Preprints can be cited as long as a DOI or archive URL is available, and the citation clearly mentions that the contribution is a preprint. If a peer-reviewed journal publication for the same preprint exists, the official journal publication is the preferred source.

Manuscript Length

Frontiers encourages its authors to closely follow the article word count lengths given in the Summary Table. The manuscript length includes only the main body of the text, footnotes and all citations within it, and excludes abstract, section titles, figure and table captions, funding statements, acknowledgments and references in the bibliography. Please indicate the number of words and the number of figures included in your manuscript on the first page.

Language Editing

Frontiers requires manuscripts submitted to meet international standards for English language to be considered for publication.

Language Style

The default language style at Frontiers is American English. If you prefer your article to be formatted in British English, please specify this on your manuscript first page. For any questions regarding style Frontiers recommends authors to consult the Chicago Manual of Style.

British English was specified for Article 1

Search Engine Optimization (SEO)

There are a few simple ways to maximize your article's discoverability. Follow the steps below to improve search results of your article: Pick 5 to 8 keywords using a mix of generic and more specific terms on the article subject(s). Use the maximum amount of keywords in the first 2 sentences of the abstract; Use some of the keywords in level 1 headings.

Title

The title should be concise, omitting terms that are implicit and, where possible, be a statement of the main result or conclusion presented in the manuscript. Abbreviations should be avoided within the title.

Authors and Affiliations

All names are listed together and separated by commas. Provide exact and correct author names as these will be indexed in official archives. Affiliations should be keyed to the author's name with superscript numbers and be listed as follows: Laboratory, Institute, Department, Organization, City, State abbreviation (USA, Canada, Australia), and Country (without detailed address information such as city zip codes or street names).

Headings and Sub-headings

You may insert up to 5 heading levels into your manuscript (not more than for example: 3.2.2.1.2 Heading title).

Abstract

As a primary goal, the abstract should render the general significance and conceptual advance of the work clearly accessible to a broad readership. In the abstract, minimize the use of abbreviations and do not cite references. See Summary Table for abstract requirement and length according to article type.

Keywords

All article types: you may provide up to 8 keywords; at least 5 are mandatory.

Text

The entire document should be single-spaced and must contain page and line numbers in order to facilitate the review process. Your manuscript should be written using either LaTeX or MS-Word.

Figure and Table Guidelines

CC-BY Licence

All figures, tables, and images will be published under a Creative Commons CC-BY licence and permission must be obtained for use of copyrighted material from other sources (including re-published/adapted/modified/partial figures and images from the internet). It is the responsibility of the authors to acquire the licenses, to follow any citation instructions requested by third-party rights holders, and cover any supplementary charges.

General Style Guidelines for Figures

The maximum number of figures and tables for all article types are shown in the Summary Table. Frontiers requires figures to be submitted individually, in the same order as they are referred to in the manuscript, the figures will then be automatically embedded at the end of the submitted manuscript. Kindly ensure that each table and figure is mentioned in the text and in numerical order.

For graphs, there must be a self-explanatory label (including units) along each axis. For figures with more than one panel, panels should be clearly indicated using labels (A), (B), (C), (D), etc. However, do not embed the part labels over any part of the image, these labels will be added during typesetting according to Frontiers journal style. Please note that figures which are not according to the guidelines will cause substantial delay during the production process.

General Style Guidelines for Tables

Tables should be inserted at the end of the manuscript. If you use a word processor, build your table in word. If you use a LaTeX processor, build your table in LaTeX. An empty line should be left before and after the table.

Figure and Table Requirements

Legends

Legends should be preceded by the appropriate label, for example "Figure 1" or "Table 4". Figure legends should be placed at the end of the manuscript (for supplementary images you must include the caption with the figure, uploaded as a separate file). Table legends must be placed immediately before the table. Please use only a single paragraph for the legend. Figure panels are referred to by bold capital letters in brackets: (A), (B), (C), (D), etc.

Format

The following formats are accepted: TIFF (.tif) TIFF files should be saved using LZW compression or any other non-lossy compression method.JPEG (.jpg)EPS (.eps) EPS files can be uploaded upon acceptance.

Legibility

Figures must be legible. Check the following:

- The smallest visible text is no less than 8 points in height, when viewed at actual size.
- Solid lines are not broken up.
- Image areas are not pixilated or stair stepped.
- Text is legible and of high quality.
- Any lines in the graphic are no smaller than 2 points width.

Funding Disclosure

Details of all funding sources must be provided in the funding section of the manuscript including grant numbers, if applicable. All Frontiers articles are published with open access under the CC-BY Creative Commons attribution license. Articles published with Frontiers automatically fulfil or exceed the requirements for open access mandated by many institutions and funding bodies, including the National Institutes of Health, the Medical Research Council, Research Councils UK, and the Wellcome Trust. Frontiers submits funding data to the Open Funder Registry which is a funder identification service from CrossRef resulting from collaboration between scholarly publishers and funding agencies.

Availability of Materials

Authors are required to make all materials used to conduct their research available to other researchers. Research materials necessary to enable the reproduction of an experiment should be clearly indicated in the Materials and Methods section. Relevant materials such as protocols, analytic methods, and study material should preferably be uploaded to an online repository providing a global persistent link/identifier. If this is not possible, authors are strongly encouraged to make this material available upon request to interested researchers, and this should be stated in the manuscript.

Authorship and Author Responsibilities

Frontiers follows the International Committee of Medical Journal Editors guidelines which state that, in order to qualify for authorship of a manuscript, the following criteria should be observed:

- Substantial contributions to the conception or design of the work; or the acquisition, analysis or interpretation of data for the work;
- Drafting the work or revising it critically for important intellectual content;
- Provide approval for publication of the content;
- Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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Material submitted to Frontiers must comply with the following policies to ensure ethical publication of academic work:

- *Original content and duplicate publication:* Frontiers only publishes original content. Authors confirm the submission of original content in the Terms & Conditions upon submission. Manuscripts submitted to Frontiers must not have been previously published or be under consideration for publication elsewhere, either in whole or in part. If an article has been previously submitted for publication elsewhere, Frontiers will only consider publication if the article has been definitively rejected by the other publisher(s) at the point of submission to Frontiers.
- *Redundant publication:* Frontiers considers the submission and publication of very similar articles based on the same experiment or study to be unethical.
- *Fabrication and falsification:* Frontiers opposes both the fabrication of data or images (i.e. fake or made up data) and the falsification of data or images (i.e. the intentional misrepresentation or deceptive manipulation of data).
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We reserve the right to contact the affiliated institutions of authors, who have not acted according to good research and publication practices.

Plagiarism and Duplication: Frontiers checks all submitted manuscripts for plagiarism and duplication, and publishes only original content.

Conflicts of Interest: A conflict of interest can be anything potentially interfering with, or that could reasonably be perceived as interfering with, full and objective peer review, decision-making or publication of articles submitted to Frontiers. Personal, financial and professional affiliations or relationships can be perceived as conflicts of interest.

Article 2 author guidelines for South African Journal of Psychology

(https://journals.sagepub.com/author-instructions/SAP)

All author guidelines for the South African Journal of Psychology were followed in the submitted article.

Impact Factor 0.782

The **South African Journal of Psychology** considers submissions addressing South African, African or international issues, including:

1. Manuscripts reporting on research investigations.
2. Review articles focusing on significant issues in Psychology.

New submissions should not exceed 5500 words, including references, tables, figures, etc. Authors of manuscripts returned for revision and extension should consult the Editorial Office regarding amended length considerations.

All manuscripts should be written in English and include an abstract of not more than 250 words. The writing must be of a high grammatical standard, and follow the technical guidelines stipulated below. The publication guidelines of the American Psychological Association 6th edition (APA 6th) must be followed in the preparation of the manuscript. Manuscripts of poor technical or language quality will be returned without review.

Preparing your manuscript for submission

Formatting

Manuscripts should be submitted as a Word document only. Templates are available on the Manuscript Submission Guidelines page of our Author Gateway.

The text should be double-spaced throughout and with a minimum of 3cm for left and right hand margins and 5cm at head and foot. Text should be standard 12 point.

Journal Style

The South African Journal of Psychology conforms to the SAGE house style. Click here to review guidelines on SAGE UK House Style.

Research-based manuscripts should use the following format: The introductory/literature review section does not require a heading, thereafter the following headings /subheadings should be used:

Method (Participants; Instruments; Procedure; Ethical considerations; Data analysis (which includes the statistical techniques or computerized analytic programmes, if applicable); Results; Discussion; Conclusion; References.

The "Ethical considerations" section must include the name of the institution that granted the ethical approval for the study (if applicable).

Keywords and abstracts

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