TIPS AND PITFALLS: DISCERNING AND CIRCUMVENTING BIAS IN RESEARCH

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IN SOCIAL RESEARCH

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Table of Contents

Introduction

Adherence to ethical norms in research is very important. It promotes the aims of research, such as knowledge, truth, and avoidance of error or bias. Ethical standards also promote accountability of the researchers to the public as well as build financial and in-kind support for research. It is very important that people, including funders, trust the quality and integrity of the research findings. Adherence to ethical norms in research also promotes important moral and social values, including social responsibility, human rights, compliance with the law, and health and safety.

This opinion piece is mostly centered on the subject of bias in social research. It poses as a reminder or caveat to researchers that they should always abide to the ethical standards of research to, principally, discern and circumvent bias throughout the stages of research. Researchers must constantly and responsibly promote the very crucial aim of research, that of advancing knowledge in a truthful manner. The very social nature of human beings, which makes it difficult to avoid *researcher effect* while conducting social research, may make it difficult to discern, prevent or minimize bias. However, adherence to the ethical standards of research should guide researchers to keep the research process free of their personal inclinations or biasness. This paper reminds researches of or exposes them to the various rules that guide adherence to the ethical standards. Agencies funding research studies and peers reviewing research reports and publications are also known to introduce bias to the research process by preferring favourable or compatible findings and conclusions. This paper suggests that their propagandist or advocacy inclinations, especially if associated with pure or basic research, be clarified through further reviews or audits.

A systematic interpretation of bias in social research

Bias, as defined by Jackson (1999), is simply an inclination or predilection to prefer a particular conclusion. It specifically refers to the systematic distortion of research conclusions. An expounded version of this definition can be traced in Merriam-Webster, which defines bias as a systematic error instilled into sampling or testing through selection or encouragement of a certain outcome or response over others.

A further analysis of the literature reveals that bias is in fact a complicated term that requires a thorough analysis in order to sufficiently understand its intrinsic relationship with research. For instance, despite confirming the easy task of defining bias, Hammersley and Gomm (1997) point out that the term remains ambiguous when it is interpreted as a systematic error. They argue that while sometimes it is defined as a systematic error associated with deviation from the true perspective, it might as well be interpreted in a more specific sense as a particular source of systematic error related to researcher's conscious or unconscious inclination to erroneous conclusions to support his predisposition. In order to clarify this ambiguity, they

look at bias on one side as one of the various potential sorts of error, and error on the other side as a matter of collegial accountability, and ultimately concentrate on procedural error as opposed to outcome error while striking a distinction between systematic and haphazard error. Their theoretical approach to explaining and understanding bias as a particular source of systematic error is displayed in Figure 1.

Figure 1: A conceptual network identifying types of error
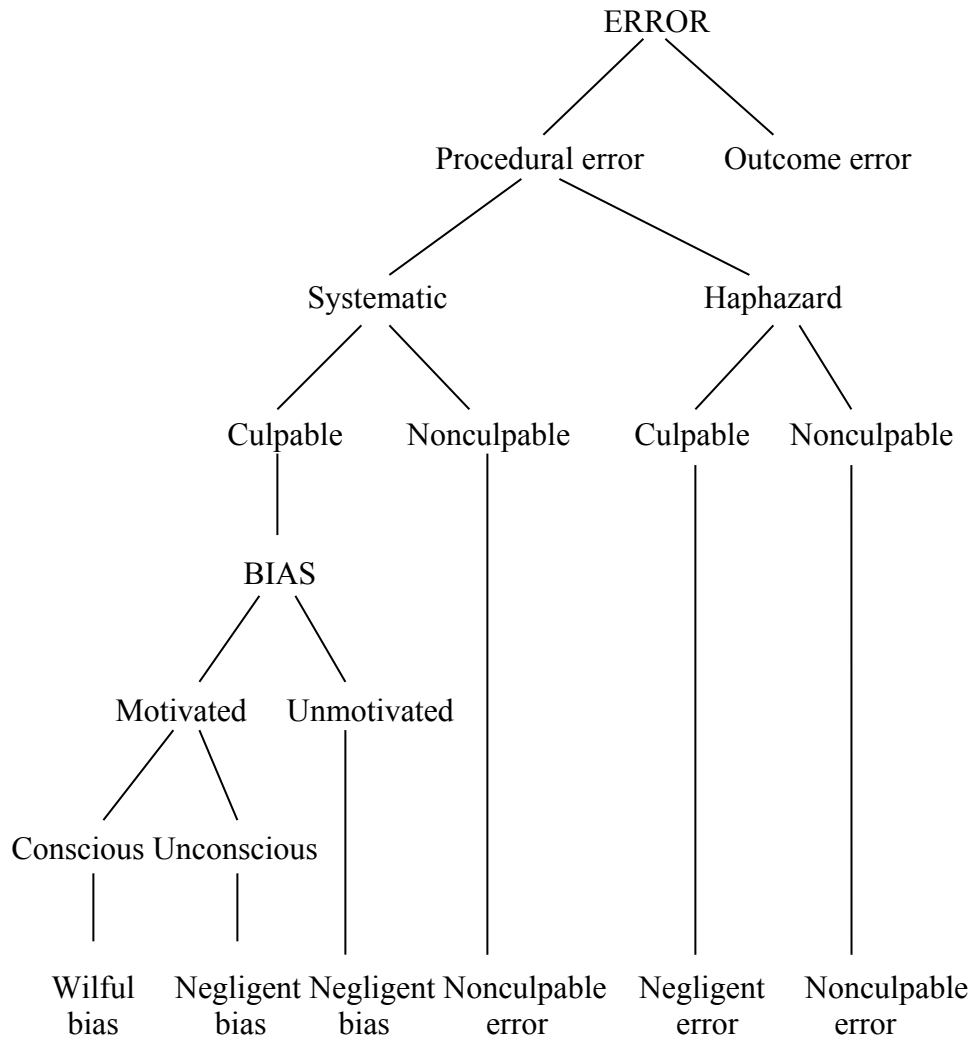
Source: Hammersley and Gomm (1997)

In providing an understanding of bias as a source of systematic error, Hammersley and Gomm (1997) interpret error in terms of deviance labelling, and confirm that the potential for this deviation is a common occurrence in research work. Therefore, as far as this deviance labelling is concerned, bias manifests itself systematically as one of the potential causes of error.

Their assertion is that bias is a systematic and culpable error. They expound their assertion by admitting that researchers may consciously or unconsciously engage themselves in systematic, culpable error thereby biasing the entire research findings despite being fully aware of the research procedures at each stage of the research process. On grounds that the presuppositions used by the researcher are either functional or dysfunctional for inquiry; the resultant systematic error will either be culpable or non-culpable. Essentially, Hammersley and Gomm associate culpable error with a situation whereby researchers, knowing that the assumptions they rely on could lead to wrong conclusions, do not take the necessary precautionary methodological steps to avoid error. As such, it is researchers who are responsible for this error by biasing the stages of the research process, in that way deviating from the fundamental duty of determining the truth about the issue concerned. As it will be further explained in the coming paragraphs, researchers in this case involve themselves with a propagandist role in an attempt to support their predispositions or act under the pressure of research funding agencies.

On the contrary, non-culpable error is bound to happen when researchers are unaware that their assumptions are erroneous or dysfunctional, hence arriving at false conclusions while believing that they were acting rationally under the circumstances (Hammersley & Gomm, 1997). A researcher may arrive at a culpable procedural error via a motivated or unmotivated bias. Contrary to unmotivated bias, which eventually leads to *negligent bias*, bias influenced by motivation on the other hand emerges with the consciousness or unconsciousness of the researcher and leads to *wilful bias* or *negligent bias* respectively. Unfortunately, Hammersley and Gomm do not define these particular wilful and negligent biases, even though assumption may suggest that while both are motivated, systematic culpable errors; the former is 'less forgivable' than the other probably due to conscious violation of the researcher's primary responsibility of increasing the chances of presenting the truth about the matter. Succinctly, Hammersley and Gomm correctly argue that bias causes error in a systematic way under motivated and unmotivated circumstances of the researcher.

Bias as a systematic distortion of research conclusions occurs at the various stages of the research process as explained by Jackson (1998). Jackson identifies two types of research, namely pure and applied, and provides a clear picture of how bias constitutes systematic distortions. Jackson argues that pure research, being value-free, tends to disassociate itself with bias as opposed to applied research which is motivated by influencing change in targeted social behaviour as desired by the person(s) or agency(ies) commissioning the research. This influence or presupposition may as well be embedded in the researcher's efforts to spread a particular propaganda. However, just like applied research, pure research can also be prone to bias owing to the so-called *researcher effect* – a process whereby the research engages in undertaking an investigation that further propagates or acknowledges the researcher's initial view or belief of a certain relationship.

Sources of bias in social research

Research bias, according to Jackson (1998), is prone to be instigated in the stages of the research process, which include (1) selection of the problem, (2) research design, (3) data collection, (4) data analysis, (5) reporting of the findings, and (6) use of the findings. His analysis of bias with respect to these stages provides an explanation of methodical distortions involved in research, thus offering a better understanding of what these distortions could be and how they may be brought about in relation to the work of Hammersley and Gomm (1997). In one way or the other, Jackson's approach expounds what Hammersley and Gomm demonstrate to be the systematic error, thus making these two approaches complementing of each other in context.

Selection of the problem

In selecting the problem, Jackson (1998) says that the researcher may be influenced by two factors that may initiate biasness in the study. The first factor is the lack of a conventionally acceptable value-free way of selecting variables for a study. This is further complicated by the fact that all research is essentially dependent on presuppositions, making it tricky for the reader to identify bias sometimes due to difficulty in establishing whether the presupposition is leading towards or away from the truth (Hammersley and Gomm, 1997). As a result, the reader fails to establish whether or not the results reported are true. The second factor is associated with pressure from peers and granting agencies to only study *important* matters as opposed to those considerably *trivial* (Jackson, 1998). Hammersley and Gomm, for example, noticed the increasing trend in Britain for contractual limitations on researches funded by government departments that require the published findings to back up existing policy, and to satisfy the role of other 'users', particularly the funding agencies. In other circumstances, according to MacCoun (1998), research topics have faced denouncements or related attempts by government officials and even the private sector for failure to acknowledge them positively. These interferences or challenges contribute to production of biased research results because researchers, due to inevitable circumstances, may be compelled to improvise with compromising conditionalities.

Research design

As regards the research design, the potential source of bias lies in the design itself regardless of whether it is a survey, panel study, case study, or experimental design. Jackson (1998) observes that bias related to the research design is pronounced in the selection of research subjects and venues where the research will be carried out. Reed *et al* (2009) also touch on this point by warning that if the selection of research subjects in any participatory exercise is pursued in an ad hoc manner then certain/important groups will be marginalized with the consequence of biasing the results. A good example of this is offered in an explanation by Babbie (2005) that researchers who tend to simply study people who are conveniently available (e.g., the first 100 people on a university campus) may end up biasing the research results because this sample may not be representative of the entire population. As a result, this leads to acquiring more responses

from, for example, women than men, hence failing to account for their percentage of composition in the entire population.

Data collection

Data collection, as another stage of the research process, carries a potential room for bias through what Jackson (1998) terms *experimenter effect* and *demand characteristics*. According to Carroll (2009), experimenter effect refers to "any of a number of subtle cues or signals from an experimenter that affect the performance or response of subjects in the experiment" (n.p.). These cues may be unintentional, and usually involve such actions of the interviewer as a raised eyebrow, change in vocal tone, muscular gestures, differences in instructions given to control and experimental groups, change in body posture, and/or researcher's dress code. In other scenarios, even the religious identity of the researcher may affect responses. Jackson explains that experimenter effect may also be caused by the survey researcher specifying the study hypothesis to either the interviewers or the respondents who may eventually bias the results by inclining to their sides of the hypothesis. In a related theme, Bernard (2000) acknowledges that there also are *gender-of-interviewer* and *race-of-interviewer* effects in telephone interviews just as there are in all types of interviews (p. 235). It is common for respondents to try and identify the race and ethnicity of the researcher and then give their responses accordingly (Bernard, 2000).

In certain circumstances too, for example, men may respond in a joking manner to female interviewers by taking the 'conversation' as an entertainment, thereby compromising the study by giving 'pleasing' or 'show-off' responses. Again, the respondent may well be affected by other people present at the time of the interview, thereby eluding sharing certain precarious facts to avoid being victimized or estranged in some way. Despite the call to understand peoples' conditions and the extent to which they are comfortable to respond to the 'stranger's' (interviewer's) questions freely (Babbie, 2005), the extent to which perceived levels of comfort and freedom guarantee unbiased responses is ambiguous. Bernard (2000) praises the effectiveness of telephone interviews in places where majority of the population have telephones, and when the researchers (particularly women) do not want to use alternative methods of interview. Nonetheless, interviewers ought to be certain of the distribution of telephones both geographically and demographically as in some places telephones are more concentrated in certain localities than others and are owned by rich/well-off people, thereby posing the potential for biasness. For instance, conducting telephone interviews in the United States (where majority of the rich people are said to be Republican) on public opinion of the presidential candidate who is likely to win over the other(s), as it was for Alf Landon over Franklin Delano Roosevelt in 1936, would apparently lead to biased results because majority of the respondents are dedicated to the Republican Party (Bernard, 2000). A further complication to using telephone interviews as a better alternative compared to interviewer's physical presence in the field is that respondents may still be influenced by the accent and speech patterns of the interviewer. For example, those using higher-pitched, louder and unambiguous tones of voice tend to have the least refusal rates

(Bernard, 2000). In other words, researchers who do not possess these qualities may either face higher refusal rates or affect the responses because of 'boring' the respondents or making it seem that the investigation is, after all, not that serious.

Turning to mailed questionnaires, it is observed that people with higher incomes who also tend to be educated are the ones who usually fill out and return mailed questionnaires in time (Bernard, 2000). In other words, if the low class members of communities are part of the study sample, the research results will fail to account for a representative picture of the entire population by missing out a substantial chunk of their responses. This necessitates the need for researchers to enquire about respondents' demographic and economic characteristics so as to be able to identify the appropriate data collection method to use or find out 'who' responded; and where the responses appear to be inclining to one class of the society, researchers should report this fact too so as to afford the reader with an opportunity to consider the results with the scepticism they deserve.

Babbie (2005) further notes that experimenters may also be biased through having their attention submerged to the experimenter group than to the control group because of their inherent interest in seeing how effectively their innovation works. To eliminate this possibility, Babbie commendably proposes the use of a *double-blind experiment* – an experiment design in which neither the subjects nor the experimenters know which the experimenter group is and which the control group is – whereby those researchers who know which subjects are in which group are barred from administering the experiment.

Babbie (2005) also points out the problem of biasness in questionnaires, and defines bias in questionnaires as those properties of questions that command particular answers from the respondent. Therefore, the manner in which the researcher frames questions in the questionnaire may influence certain responses and lead to biased conclusions. This structuring and asking of questions may lead to what Jackson (1998) calls *demand characteristics* - a situation in which respondents are influenced by the questionnaires or interview guides to respond in line with what they think is expected of them by the interviewer, thus leading to distorted responses and, eventually, biased results. In giving guidelines for asking questions, researchers should provide respondents with an exhaustive list of wide range answers for them to select one or several that they judge appropriate for the question asked, including affording them the chance to specify 'other' answers they deem viable for the question. Researchers should avoid using double-barrelled questions (asking respondents to choose only one answer for a question that qualifies for multiple answers), e.g., "agree" or "disagree", thus depriving them the opportunity to give their own views. Using double-barrelled questions may not appeal to the opinions of some of the respondents who may eventually just skip the question, thereby rendering the final results vulnerable to bias for failure to represent the opinion of the entire targeted population.

It is further stated that advocacy role of the researcher is not a strange phenomenon when it comes to conducting case studies. Burn (2000) relates this advocacy to bias because of the role

of human subjectivity in selecting supporting or refuting evidence, thereby influencing the findings or conclusions. This is particularly true, for instance, when the researcher tries to provide evidence in support of his predisposition or to satisfy the demand of the research granting agencies. Ragin (1994) warns that even when this advocacy role is played in order to give voice and enhance the visibility of a specific group in a society for certain motivations, advocacy research should not be confused with giving voice as a research goal since the latter conforms to objectivity and neutrality as much as possible with the intention of minimizing bias. This is an indication that the advocacy role of the researcher should be strictly gazed in the spectrum of mere propaganda, and not research findings or conclusions.

Again, much as it is arguably right to pay respondents a fee for their participation (Jackson, 1998; CIHR, NSERCC & SSHRCC, 2005), CIHR *et al* correctly warn of the possibility of researchers to cause bias to their research results if they pay participants beyond their normal range of benefits hence influencing an undue incentive for participation. This may be aggravated in the circumstances where, for example, 'overpaid' urban youth respondents have figured out what is required and expected of them by the researcher (e.g. when they believe that the purpose of the research is to validate a hypothesis that youths in rural and urban areas differ in pronouncing words of their common tribal language due to location-over-time factor), thus giving 'pleasing' answers.

Data analysis

Research bias in the data analysis stage arises due to what Jackson (1999) calls data massaging – the practice of playing with the data until the analysis producing the strongest association is identified and retained. This practice is a violation of the principles of objectivity, and it is more common with the use of modern computer that makes it possible for researchers to test a variety of different relationships until those results that make the *most sense* are identified and retained. Jackson describes this practice as *hunting through a data set*. Though 'hunting' is not inherently wrong, if it goes undisclosed then the report disseminates deceiving findings that leave the reader in no position to critically analyse the conclusions.

Reporting of the findings

Bias related to reporting of research findings, as described by Jackson (1998), emerges from two different angles: (1) publishers ordinary inclination to publish results that show statistically significant relationships as opposed to those that do not report findings of relationship, and (2) pressure to keep papers short by journal publishers, which may compromise the whole finding of the research project in that the published findings may not be representative of the entire project findings. The latter may further be amplified by the significance of the finding in relation to cultural considerations of the researcher's peers (Jackson, 1998). MacCoun (1998) verifies this point by affirming that the evaluation of the methodology and findings are sometimes done favourably and accepted for publication only when they are in line with the experts' views. Publishers and researchers alike, as human beings, may also be influenced by

particular issues and trends in societies that may affect their analysis of and approach to work. For example, Hess (2006) admits that much of the research published over the years pertaining to abortion appears to have been influenced by a preconceived point of view owing to the sensitive nature of the subject itself as far as political, religious, and moral implications are concerned. Sensitive subjects like abortion may actually trigger emotional and philosophical conflicts among researchers during each stage of the research process (Hess, 2006). Quite unfortunately too, authors themselves may be tempted to make available for publication only those results that support their stand point, and this is particularly true of advocacy researchers. All in all, these practices are unethical and violate the underlying objective of research.

Use of the findings

The use of findings may also be biased by those who interpret/review them. This observation is also acknowledged by Hammersley & Gomm (1997) who say that not only research itself but also research evaluations can be biased. Referring to a debater model (biased) and a science model (unbiased), Jackson (1998) acknowledges the inherent difficulty in identifying the research model that has been used for the study, and this could further be complicated by researchers who demonstrate characteristics of both models. As such, researchers may tend to inadvertently engage themselves in numerous advocacy roles. As a lesson and reminder, Meltzoff (2005) articulates that people who betray themselves in their conceptualization of information and ideas are definitely going to betray others when discussing them. As the process goes on and on, they might even end up confusing themselves too by failing to distinguish the reality from idealism or idealism from the reality out of their own work.

Research Ethics Boards (REBs) may also constitute another source of bias by attempting to fine tune the research proposals to the satisfaction of ethical standards, thereby compelling the researcher to fulfill the ethical requirements even if it means compromising research results in order to produce the so called socially desirable results (Seifert, 2005). Indeed, this can instil bias in the stages of the research process explained above by, for example, forcing the researcher to omit/change those questions considered 'dangerous' to research subjects, consequently dictating which data should be collected. Patterson (2008) emphasizes on this incident by noting that the pressure imposed on researchers by REBs tends to prioritize a certain type of research and relationships within a community and marginalize others. Citing the consent forms, for example, Senn and Desmarais (2006) tested the effect of their wording for two different studies characterized by sensitive sexual content – viewing of sexual imagery and personal questions about sexual experiences, abuse, and assault. The stronger wording of consent forms focusing on the risk of participants or on providing details about sensitive content may actually change participants' responses. Eventually, the researcher who took all the necessary steps to minimize bias may be convinced that he has succeeded in doing so while, in fact, it came in through the 'policing' agency without his awareness. Typically, this is what constitutes a systematically non-culpable error.

Can we do away with bias in social research?

Jackson (1998) acknowledges that social science in its nature cannot completely do away with bias but simply attempt to minimise it. This view is also shared by other researchers, such as Ragin (1994) who, in describing and explaining the goals of social research, concludes by acknowledging the unavoidable social implications of social research which subject social researchers to bias regardless of the goals they choose to pursue for their researches. This is because in social research the researcher is part of the subject matter, qualifying automatically because of his status as a human being. As described in the preceding paragraphs, researchers and even publishers may be biased depending on the extent to which they have been influenced by the social world that they also share with other people. Ultimately, Jackson recommends six general rules and five specific rules for minimizing bias.

General rule one: use institutional de-biasing mechanisms

The first general rule is for researchers to be aware that conclusions of reported research findings could be influenced by bias at one stage or another with respect to the stages of the research process, hence the need for them to be sceptical and critical of their own works and those of other researchers (Jackson, 1998). However, as noted in MacCoun (1998), while other researchers have proposed the use of institutional de-biasing mechanisms in an event of failure of self scrutiny - such as peer reviewing, research replication, and meta-analysis, among others - peer reviewing has been criticised for being unreliable:

> A dozen scientific articles were retyped and resubmitted (with fictitious names and institutions) to the prestigious journals that had published them 18-32 months earlier. Three were recognized by the editors; eight of the remaining nine not only went unrecognized but got rejected the second time around (MacCoun, 1998; p. 277).

Research replications have also been noted for failing to adequately safeguard against researcher bias because (1) it is difficult to produce exact replications, (2) they are incapable of eradicating any bias that is implanted in the study's methodology, and (3) editors and publishers are often inclined against publishing them (MacCoun, 1998). However, meta-analysis is well recognized by social scientists because of its remarkable corrective benefits for exposing errors or uncertain practices overlooked by journal referees (MacCoun, 1998). Clearly, therefore, much as peer reviewing and research replications are recognized as useful institutional de-biasing mechanisms, reviewers need to give meta-analysis the priority it deserves over the other two.

General rule two: recognize self-biasness

The second general rule requires researchers to avoid bias by first recognizing it, whereby Jackson (1998) urges them to rather base their trust in logically and/or empirically derived conclusions as opposed to the ones arrived at on speculative grounds. Hess (2006) acknowledges

the importance of researchers to be aware of self bias in order to overcome (minimize) it by at least recognizing the fact that they may not be entirely free of it. Kennedy (2006) goes a step further and indirectly proposes that ethical standards should also incorporate the need for both qualitative and quantitative researchers to state their backgrounds and declare their personal biases all the same in order to relieve the reader with the responsibility of trying to guess what they might be. Although this proposition may sound like a burden to researchers, the logic behind it is of relevance. Adhering to this ethical call fosters quality standards and portrays an epic professional maturity among the respective researchers.

General rule three: identify and separate conclusions from debater and science models

As for the third general rule, Jackson (1998) encourages the identification and separation of conclusions that originate from a debater model and those that emanate from a science model since the former is a manifest of advocacy, whereby advocacy biases research results because it supports a particular view point while avoiding opposing evidence. However, the challenge to this solution comes from Jackson's own acknowledgement of the inherent difficulty in identifying the research model that has been used for the study, and more so when researchers demonstrate characteristics of both models. Thus, the extent to which this rule may apply in practice and perhaps with necessary improvements necessitates a further analysis and investigation.

General rule four: understand and clarify the standards and viewpoints of advocacy research

The fourth general rule is for researchers to adapt to the science model and avoid advocacy research by constantly ruling out alternatives and disconfirming theories rather than trying to prove and support them (Jackson, 1998). However, as argued by MacCoun (1998), taking an advocacy role should not be viewed as a shameful thing provided that researchers are self-conscious about their standards and viewpoints, and make them clear. The latter argument is an indication that bias is not necessarily a bad thing so long as researchers are open about their interests and are able to justify their course of direction because not all biases are indefensible.

General rule five: use theories to test relationships

The fifth general rule requires researchers not to use theories for the purpose of supporting relationships but, alternatively, task them with the duty of testing such relationships with an ultimate goal of making general statements or summarizations (Jackson, 1998). Additionally, even though some researchers cite falsification of theory by induction method as an identifier of bad ideas, which also separate science from pseudoscience, other scrutinizers identify it for failing to adequately confirm the falsification of hypotheses especially because resourceful psychological theorists may defend their hypotheses without failure (MacCoun, 1998). Although not exhaustively researched for this paper, it remains ethically correct for researchers to use theories strictly for the purpose of testing relationships as opposed to supporting them.

General rule six: adhere to value neutrality

The sixth general rule described by Jackson (1998) is for researchers to strive and dissociate themselves from their own preferred views of an ideal society, hence retaining a value-neutral stance just as professional researchers ought to. Researchers should strive to act professionally at all times if they are to win over the influence of their presuppositions and those of their peers.

Specific rule one: keep hypotheses undisclosed

Turning to the specific rules that researchers should adhere to in order to minimize bias, Jackson (1998) begins by addressing the expectancy bias whereby he cautions researchers to not make their hypotheses known to respondents or interviewers but rather to simply provide them with a general description of what the study is concerned with. However, this may be difficult to achieve at times as a serious interviewer and even respondent may figure out what the researcher is trying to prove or test through the structuring of the questions, and even experimenter/interviewer effect.

Specific rule two: shy away from double-barrelled questions

As a second specific rule, and in line with an attempt to prevent demand characteristics, Jackson (1998) advices researchers to provide a full range of attitudinal response categories in a continuum style so as to give the research subjects a sense of and confidence that whatever they choose for an answer is principally expected and accepted by the researcher. This suggestion/rule is also supported by Babbie (2005) who proposes that researchers should shy away from administering double-barrelled questions.

Specific rule three: do not influence responses

The third specific rule for minimizing bias requires interviewers to respectfully assume a neutral position and avoid influencing responses by developing a genuine interest in respondents' answers as opposed to coaching them (Jackson, 1998). This is a useful rule and worthy of abiding to even when researchers and interviewers are psychologically biased (as human beings).

Specific rule four: specify data analysis procedures

Fourth, as a way of avoiding data massaging, researchers are required to specify the data analysis procedures to be used ahead of collecting the data (Jackson, 1998). However, as explained above, when they fail to satisfy this rule then they better specify the data massaging that took place if hypotheses are involved.

Specific rule five: report other relationships

Finally, as much as researchers generally desire to report those results they consider 'best', they should also take the responsibility of clarifying the number of other relationships that have been explored and the rationale for not reporting them (Jackson, 1998). This is an expansion of the previous rule in that all relationships observed during the data massaging process involving a hypothesis-based study must also be tabled to afford the reader/reviewer a chance to regard the research results with a deserving scrutiny and scepticism. Relatedly, researchers should intentionally provoke and professionally manage criticisms against their work. They need to accept that inviting and encouraging criticisms is not necessarily a bad thing but rather a stimulant of better practices.

Conclusive Opinions and Recommendations

Bias in research is recognized as not necessarily implying a negative practice or conduct by researchers. In fact, as already stated, bias in research may be inevitable given the human nature of the researchers themselves. However, it would behove researchers to abide to the underlying goal of research – that of producing knowledge – by adhering to the principle of neutrality in order to minimize bias in their work and treat the field of research with the respect it deserves. One ugly reality ahead of them is that of overcoming manoeuvres and pressures imposed on them by peer reviewers, research granting agencies, and publishers. This area requires a serious research to address, including researchers coming together and forming sound principles to safeguard their own statuses and that of research as a whole. One key kick-off strategy would be for researchers to seriously consider and abide by the general and specific rules for minimizing bias as recommended above. They should, additionally, wage a collective effort in order to address the challenges they specifically face in abiding by the general and specific rules and identify possible solutions. This may go hand in hand with identifying and publicizing biased researches as well as their peer reviewers, and even the research granting agencies. Caution should also be exercised in regarding 'whoever does research' as a researcher. People may be placed in researcher roles even when they hardly qualify. Filtering out unqualified researchers from those who qualify should necessarily constitute a grand step towards avoiding or minimizing bias across the stages of the research process.

Importantly, the lessons and recommendations presented in this paper are by no means exhaustive of the entire picture or the ultimate solution to the problem of bias in research, but a mere caveat for researchers to be cautionary throughout the entire stages of the research process. The literature is, by all means, amply available to facilitate further enquiry into the subject matter. Much as bias, particularly in the field of social research, is arguably inevitable, researchers ought to employ the necessary skills and techniques to minimize it and generate knowledge that is as neutral as possible. If this goal contradicts their interests then they must disclose their predispositions or those of the peer reviewers and funding agencies. Of paramount importance is that social research must not be used to misinform or misguide the audience.

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