ORIGINAL ARTICLE

Bias Analysis in Forensic and Non-forensic Psychiatric Assessments

Prof. Dr. Álex Escolà-Gascón*[1]

Prof. Dr. Neil Dagnall[2]

Prof. Dr. Kenneth Drinkwater[2]

[1]Blanquerna Foundation, Ramon Llull University, Barcelona, Spain.

[2]Psychology Department. Faculty of Health, Psychology and Social Care, Manchester Metropolitan University, Manchester, United Kingdom.

***Corresponding author information:** Prof. Dr. Álex Escolà-Gascón. Professor of Applied Mathematics and Statistical Methods at Blanquerna Foundation, Ramon Llull University (e-mail: alexeg@blanquerna.url.edu).

How to cite this work: Escolà-Gascón, Á., Dagnall, N., & Drinkwater, K.. (2023). Bias Analysis in Forensic and Non-forensic Psychiatric Assessments. *International Journal of Law and Psychiatry, 88,* 101891. https://doi.org/10.1016/j.ijlp.2023.101891

Bias Analysis in Forensic and Non-forensic Psychiatric Assessments

Abstract

In this research, we provide two important contributions to the psychiatric community. First, we offer the first valid and reliable cognitive test that measures forensic clinicians' ability to detect and avoid diagnostic biases in psychiatric assessments. Second, we also estimate the prevalence of clinical decision bias detection and prevention ability among psychiatrists and psychologists. A total of 1069 clinicians from different specialties (317 psychiatrists and 752 clinical psychologists, of which 286 were forensic clinicians) participated in this research. The *Checklist of Biases for Clinicians* (BIAS-31) was developed, and its psychometric properties were analyzed. The prevalence of bias detection and prevention was estimated using BIAS-31 scores. The BIAS-31 is valid and reliable for measuring clinicians' ability to avoid and detect clinical biases. Between 41.2% and 55.8% of clinicians try to avoid biased clinical judgments. Likewise, between 48.5% and 57.5% of clinicians were able to correctly detect the biases involved in the diagnostic assessment process. We did not expect to obtain these prevalences. Therefore, we discuss to what extent specific training in the prevention of diagnostic biases is necessary and propose several clinical strategies to prevent a priori the occurrence of biases in the psychiatric assessment.

Keywords: Biases; Quality of decisions; Diagnostic biases; BIAS-31; Psychiatric biases

Bias Analysis in Forensic and Non-forensic Psychiatric Assessments

1. Introduction

Biases can occur in verbal discourse and in arguments made by human beings. An argument is biased or fallacious when it presents a logical error that fosters confusion and generates incorrect decisions or conclusions (Hansson, 2004). In this sense, a fallacy is an argument that usually has three characteristics (Woods & Walton, 2018): (1) it is based in bias (Ricco, 2007); (2) it contains false propositions (van Eemeren, 2013); and (3) it offers information that is not exhaustive and/or exclusive (Walton, 1999). The word "bias" is used in clinical psychology to describe various dysfunctional forms of cognitive information processing (Covin et al., 2011). Conclusively, erroneous cognitive processing causes a person to make incoherent arguments and automatic attributions (Berthet, 2021). In general, most scientific research has found that the most frequent cognitive errors were overgeneralization, absolutist or disjunctive thinking, presuppositions (also called "jumping to conclusions"), causal statements without supporting data (also called "thought readings"), exaggeration or minimization of information, circular or repetitive thinking, and reductionist statements (also called "mental filtering") (Beck et al., 1987; Kassirer & Kopelman, 1989). Therefore, if we relate the concept of "bias" to the term "fallacy," we find the following characteristic in common: both fallacies and biases are errors that occur in verbal reasoning and in the way people think (Imai et al., 2021).

The study of fallacies and biases is very important for two main reasons. First, identifying fallacies constitutes a very useful psychotherapeutic tool for the treatment of affective disorders (Jones & Sharpe, 2017). The discomfort felt by the patient is often the result of erroneous reasoning. Modifying such reasoning and facilitating the patient to develop alternative and functional thoughts is a strategy that promotes well-being and reduces depressive symptomatology (Beck et al., 1985). Second, the study of biases is essential because they directly impact the decisions we make (Escolà-Gascón, 2020; Matute et al., 2015). The effects of fallacies or biases on decisions have been studied in many fields (Kliegr et al., 2021). In the field of psychiatry, the effects of biases have usually focused on the patient, but they can also occur in the discourse performed by the clinical evaluator (psychiatrists and psychologists) (Norman et al., 2017). Research lines that analyze biases in the clinical decisions of psychiatrists and psychologists rely on dual process theory (hereafter DPT) to classify and identify the most common errors (Bowes et al., 2020). DPT postulates that cognitive reasoning develops from two operational pathways (Ball & De Neys, 2018): on the one hand, there is the intuitive pathway (type 1 reasoning), which defines a type of reasoning based on first impressions, spontaneity and improvisation (Pennycook et al., 2018). Unlike the rational type, intuitive reasoning is automatic and not controllable (Ross et al., 2017). On the other hand, there is the analytical pathway (type 2 reasoning), which is characterized as strategic, logical, conscious, voluntary and controllable (Pennycook et al., 2018).

One of the characteristics of intuitive cognitive reasoning is that it employs heuristic judgments in decision making (Kahneman, 2011). According to the review by Leonardi et al. (2021), heuristic judgments tend to be unconscious (or automatic) and are imperfect – they are reasonings in which inference biases based on fallacies can easily predominate. In relation to biases, Tversky and Kahneman (1974) initially identified three types of error-containing heuristic judgments. We should note that these types of heuristic judgments are still current today (see Hussain & Oestreicher, 2018 for further review).

The first type of judgement is *availability heuristics:* a reasoning related to assessing the degree of familiarity that a given mental representation has. In this case, the error occurs when the individual assumes that they are familiar with a given mental representation or content, and then, based on their assumed familiarity, also assume said mental representation or content to be common and true. Inferring that something is true because it is perceived as frequent is a type of argumentative fallacy related to presupposition bias: it is assumed that something is true because it is "common" (Beck et al., 1983; Croskerry, 2003). The second judgement type is the *representativeness heuristic*, which is related to the cognitive schemas and meaning systems attributed to each category. In this judgment, the error occurs when the individual perceives a stimulus from the environment is coinciding with one of his previously learned cognitive categories; because the stimulus is coincident with his or her system of meanings, the individual accepts that the stimulus is true. This error is very typical of the fallacy or confirmation bias, in which the certainty of a phenomenon is confirmed by the simple fact that it corresponds to previously acquired schemas (see Cohen & Burgin, 2016; Escolà-Gascón et al., 2021).

The third type is *anchoring heuristics* and is associated with the estimation of quantities from certain previous numerical thresholds. These thresholds represent anchors or frames of reference that, if inconsistent, will generate biases in the judgment or decision made by the individual. The anchoring heuristic is not explicitly related to any fallacy, but it is connected to the tautological bias, in which the individual employs, as justification, a content that replicates or reproduces the phenomenon it intends to explain (Beck et al., 1983; Mendel et al., 2011). In the context of psychiatry, an example of this fallacy occurs with statements such as "The patient suffers from psychosis because he hears voices inside his head." The above statement is tautological because if we were to invert the terms we would see that it is a recursive argument: "The patient hears voices inside his head because he suffers from psychosis." If instead of qualitative estimates they were numerical quantities, we would be faced with the same problem.

In fact, in terms of probability, this fallacy was classified by Wagenmakers et al., (2011) as the fallacy of the inverse error, which also refers to how we can understand why errors of inference occur by inverting the terms of an argument. The main characteristic of heuristic judgments is that they develop automatically or unconsciously (Kahneman, 2011); this coincides with the definition of bias by Covin et al. (2011) and allows us to substantiate the theoretical approach to the standardized measurement of clinical biases.

Biases can occur through both the intuitive and analytical pathways, although it is in the intuitive type where a greater number of biases occur (Ball & De Neys, 2018). In the clinical interview, reasoning, arguments and diagnostic decisions should not be based solely on the clinical intuition of the evaluating professional (Bhugra et al., 2011; Srivastava & Grube, 2009). Good practice in psychiatric assessment requires that decisions be properly grounded in logic and scientific evidence (Cook et al., 2017). Although many of the wrong clinical decisions are attributed to the excessive use of the intuitive approach (Srivastava & Grube, 2009), the following question can also be raised: to what extent do biases also occur in the analytical type and what implications do they have for the patient?

In psychiatry, the clinician's ability to detect and prevent biases in diagnostic decisions has been investigated mainly from a basic science perspective. For example, qualitative and case studies were conducted (Galanter & Patel, 2005; Hemmat & Santhosh, 2020); some were based on semistructured interviews (Bhugra et al., 2011), and others were experimental (Mendel et al., 2011). Most of these studies focused on a particular fallacy and obtained results suggesting the presence of biases in clinical decisions (Mendel et al., 2011). Similarly, epidemiological studies were conducted on the predominant clinical biases, and the results also showed that there were certain deviations that increased the number of diagnoses of certain disorders (i.e., attention deficit hyperactivity disorder) (Kazda et al., 2021). If biases and fallacies are present in mental health professionals and their clinical decisions, knowing how to prevent them is an essential responsibility of the medical community (Schiff, 2008). To do so, a standardized protocol is required to quantify the skill of each psychiatrist or psychologist in detecting the presence of biases in the decisions made during the development of the clinical interview.

The present research has three essential objectives: (1) to provide the medical community with a standardized cognitive skills test to assess each psychiatrist's technical ability to detect fallacies and biases in clinical decisions. This new cognitive test is called the Brief Checklist of Biases for Clinicians (BIAS-31). (2) To identify the most frequent biases among psychiatrists, taking into account the following classifications: confirmation bias (equivalent to the Aristotelian fallacy of the antecedent and consequent statement); precipitated conclusion bias (equivalent to the presupposition fallacy); and tautological bias (equivalent to the circular thinking bias). These last two biases were typified by Beck et al. (1987) as described at the beginning of the introduction (Beck et al., 1987). Confirmation bias is described in the work of Mendel et al. (2011) (Hemmat & Santhosh, 2020). In addition, these typologies of biases also coincide with the original classifications of heuristic judgments by Tversky and Kahneman (1974) and with Leonardi et al.'s (2021) review of unconscious features with respect to how they happen. (3) To identify where more biases and fallacies occur among the professional fields in which psychiatrists intervene. The field was classified according to the professional's field of action: forensic psychiatry-psychology, inpatient psychiatry and outpatient psychiatry.

We believe that developing the first cognitive tool for bias assessment is an essential step in the detection and prevention of erroneous diagnostic decisions. Likewise, detecting and understanding argumentative errors allows diagnostic decisions to be optimized, since the health professional can carry out specialized training on biases and train the accuracy of their clinical decisions through the use of the BIAS-31 test.

2. Methods

2.1. Declarations

2.1.1. Ethics approval

The Committee of Ethical Guarantees of the [*masked information*] reviewed, favorably evaluated and approved this research.

2.1.2. Data availability statement

The authors confirm that the data will be available upon request.

2.1.3. Competing interests

The authors confirm that there are no known conflicts of interest associated with this publication.

2.1.4. Funding

The authors confirm there has been no significant financial support for this work that could have influenced its outcome.

2.1.5. Acknowledgements

The authors would like to acknowledge all the clinicians, psychiatrists, and psychologists who anonymously participated in this survey and collaborated by responding to the evaluation tests.

2.1.6. Preregistration

This study was not preregistered.

2.2. Participants

A total of 1069 psychiatrists and clinical psychologists who were active in clinical practice participated in this study. All of them were between the ages of 28 and 58 (total mean=

36.31; total SD= 7.246). Table 1 provides sociodemographic information of the participants differentiated according to professional setting: forensic psychiatry, psychiatric outpatient or psychiatric inpatient.

[Table 1 near here]

As seen in Table 1, the autonomous community in which the professional resided and their years of clinical experience were also included. All collaborated voluntarily and without receiving any economic reward for their participation. Before answering the questions, it was explained to them what this study was about and what the conditions or instructions for answering the tests were, and they were notified that they could modify their answers whenever they wished. The data were treated completely anonymously, including the hospitals and clinics in which the professionals worked.

2.3. Materials: Brief Checklist of Biases for Clinicians (BIAS-31)

The BIAS-31 is an assessment tool that aims to examine the cognitive ability of clinicians to detect and prevent bias in assessment interviews (or diagnostic interviews). Each test item is a dialogue between an actor-patient and an actor-clinician. In total, the BIAS-31 has 31 items. The participant must assess and analyze the reactions of the actor-clinician.

Concretely, this test consists of two parts. The two parts have the same items (31 for part 1 and for part 2). Although both parts of the test have the same items, they differ in the following points: (1) the instructions given to the participant; (2) the coding of the responses; and (3) the object of evaluation is the same, but the conditions of how to assess the reactions of the clinical actor change. Figure 1 shows the first two items of the Spanish version of the test; the English translation is shown in the legend of Figure 1.

[Figure 1 near here]

Part 1 addresses the clinicians' perception or opinion of the actor-clinician's reactions in the dialogues. In this first part there are no right or wrong answers. The responses in part 1 are coded following the Likert-type scaling model. Thus, the response options range from "0" (which means "not at all adequate") to "4" (that means "totally adequate"). Each professional must assess the degree of appropriateness of the clinical actor's reactions considering the contextual information of the assessment interview. In this part, the total direct scores range from 0 to 124 points.

Part 2 is related to the detection of biases and fallacies. In this case, participants must point out which reactions of the actor-clinician are biased and which are not. In this second part, there are correct and incorrect answers; for this reason, the BIAS-31 is also a test of cognitive skills and optimal performance. Specifically, this part of the BIAS-31 is designed to test verbal-logical reasoning. When the participant points to the correct alternative, a "1" point is added, and when the participant does not point to the correct answer, a "0" is scored. Errors do not subtract points from the correct answers. The fewer errors the participant had, the greater his or her analytical capacity in the detection of bias and verbal rigor. The 31 items of part 1 are the same as the items of part 2. In this part, the direct scores vary from 0 to 31 points. Items 2, 10, 14, 19, 23, 26 and 30 are the only actor-clinician reactions that are unbiased (contain no bias). In the remaining 24 items or dialogues, the actor-clinician reacts in a biased way to the actor-patient.

According to the theory, the BIAS-31 items are classified into three types of bias: (1) Tautological Biases, (2) Presupposition Biases and (3) Biases of Confirmation. For each type of bias, it is possible to obtain a score. This applies to both Part 1 and Part 2 of the test. The validity and reliability of the BIAS-31 is presented in the results section.

2.4. Procedures

2.4.1. Design and Development of BIAS-31

The design of this research was correlational. Several psychometric models were used to validate the BIAS-31, and contrasted group models were applied to analyze in which professional psychiatric settings (forensic, inpatient and outpatient) biases in diagnostic assessments were most prevalent. The development of BIAS-31 can be divided into three key points:

(1) Item drafting. Item drafting was based on Woods & Walton’s (2018) theories on the formulation and theory of fallacies (Woods & Walton, 2018). To apply logical fallacies in the clinical and psychiatric context, the DPT (Pennycook et al., 2018; Ross et al., 2017) and the classification of cognitive biases established by Beck et al. (1987) (Beck et al., 1985) were used. Since the number of biases was very extensive and it was not possible to evaluate all of them, the empirical evidence provided by Mendel et al. (2011) and the recommendations of Bowes et al. (2020) were taken into account. According to the evidence, the following biases were chosen: confirmation bias, hasty conclusion bias and tautological bias. For each bias, 12 dialogues were drafted between an actor-patient and an actor-clinician that simulated a brief conversation during a clinical interview. Eight items whose clinician’s responses were unbiased were also written.

(2) Rational and qualitative review of the items. Once the initial 44 items of the BIAS-31 were drafted, two clinical psychologists and two psychiatrists were asked to analyze the quality of the dialogues. Specifically, the clinicians were to examine two parameters: on the one hand, they had to specify whether the dialogues were representative of the questions and conversations that typically take place in clinical interviews. On the other hand, these reviewers had to analyze the quality and clarity of the wording of the dialogues. Of the 44 initial items, 13 were discarded for presenting excessively specific and morally questionable content. Four of them were unclear and had too many interpretations. Therefore, after this qualitative review, only 31 final items remained (7 items for hasty conclusion bias, 8 for tautological bias and 9 for confirmation bias).

(3) Preparation of the application materials. Finally, once the items to be used for the validity and reliability analyses were known, informed consent, the specific instructions for each part of the test, the response booklets and all the materials were digitized using a web application for surveys. Specifically, Google Forms was used. Once all the preparation of the application materials was completed, the procedures regarding sampling and inclusion/exclusion criteria were determined. This is explained in subsection 2.3.2.

2.4.2. Sample Inclusion and Exclusion Criteria

Sample participants were contacted through e-mail and telephone calls to the clinical units in which they worked.

Considering that the biases in the items were written for an adult audience and were specific to psychiatrists and clinical psychologists, the inclusion criteria were as follows: (1) Holding a specialty in psychiatry (in the case of physicians) or the title of “General Health Psychologist” (hereafter PGS) (in the case of psychologists). Psychologists who had completed the “PIR” (resident internal psychologist) and those who had the PGS degree validated by their clinical experience were also admitted. (2) At the time of the investigation, officially exercising clinical assessment and intervention functions in a mental health center or hospital. (3) Residing in Spain, understanding, speaking and writing Spanish at a native level; (4) exclusively treating patients over 17 years of age and under 65 years of age. All types of mental disorders (including factitious disorders) were admitted with the exception of those with a neurological origin or with a proven organic etiology.

Specific exclusion criteria were as follows: (1) Failure to meet any of the above inclusion criteria. (2) Treating patients with physical disabilities (including disabilities related to hearing, vision or speech) and mental disabilities. (3) Treating patients under 16 years of age. Treating adolescents would imply that the clinician is practicing in a child and adolescent setting. (4) Treating patients over 65 years of age or patients with the presence of some type of cognitive deficiency, dementia or Alzheimer’s disease. (5) Treating patients with terminal medical illnesses with no cure.

All data, both from the professionals who chose to participate and from the mental health centers/hospitals, were blinded and anonymized.

2.5. Statistical Analysis

The data were processed with the AMOS extension of SPSS Statistics, and JASP support was used as a complement to execute the commands of the R programming language (The Jamovi Project, 2019). The statistical analyses were divided into two parts: first, structural equation modeling was used to analyze the construct validity of the BIAS-31. The construct validity was analyzed with the confirmatory factor analysis technique (CFA). The maximum likelihood method was used for parameter estimation, and several goodness-of-fit indices were calculated to check whether the theoretical model reproduced the observed data. The CFA was applied only to part 1 of the BIAS-31. Part 2 of the test was a typical performance test, and its validity was analyzed by means of a predictive study (criterion validity): Part 1 scores were correlated with Part 2 results. The following reliability coefficients were used: Cronbach’s alpha, the KR-20 formula for dichotomous items (called the Kuder-Richardson 20 formula) and McDonald's omega coefficient. The KR-20 equation used in this analysis was as follows:

$$KR-20=\left(\frac{K}{K-1}\right)*\left(1-\frac{\sum p\cdot q}{\sigma^2_{Total}}\right),$$

where:

K is the number of items in the test,

$\sum p\cdot q$ is the sum of the variance of the test items,

$p=\frac{TCA}{N}$,

TCA= total of correct answers, and

N= total number of participants.

Likewise,

σ^2_{Total} = is the total variance, and

$q=1-p.$

All preconditions were assumed in order to use all the models and coefficients presented (including univariate and multivariate normality of the items).

Second, hypothesis testing was applied to analyze whether there were significant differences between the mean scores of psychiatrists working with outpatients, inpatients or in the forensic setting. In this case, a classical *analysis of variance* (one-way ANOVA) was applied. The preconditions of statistical normality were assumed. Since the sample size was >1000, two rates were calculated: (1) the bias avoidance rate (BAR), which would indicate the proportion of clinicians who attempt to avoid biased responses; and (2) the bias detection rate (BDR), which would indicate the prevalence of clinicians who know how to effectively detect the presence of bias in clinical decisions.

The BAR was calculated from the BIAS-31 part 1 scores, and the BDR was calculated from the BIAS-31 part 2 scores. The total means ($\bar{\mu}_i$) of each of the factors (F_i) of the BIAS-31 assessing fallacies were used in both rates. Therefore, the equations for these rates were very simple:

$$BAR = \frac{N\left\{F_i < \bar{\mu}_i\right\}}{N_{Total}} \cdot 100$$

and

$$BDR = \frac{N\left\{F_i > \bar{\mu}_i\right\}}{N_{Total}} \cdot 100,$$

where N refers to the number of subjects and the selection condition is included between the braces.

3. Results

3.1. Validation: Structural Equation Modeling

The theoretical model of the 4-factor BIAS-31 is presented in Figure 2. It should be noted that each factor represents a type of bias and thus a certain type of fallacious error. The unbiased factor predicts the 7 dialogues that are free of fallacies.

[Figure 2 near here]

To test the degree to which the theoretical model in Figure 2 fitted the responses (observed data), goodness-of-fit indices were calculated. These indices are presented in Table 2.

[Table 2 near here]

The results in Table 2 allow us to accept the fit of the theory to the data. The chi-square statistic had a significant critical level. This does not allow us to accept the fit of the proposed model to the data. However, there is sufficient empirical and statistical evidence showing the instability of this statistic when working with large samples (N>800). Given the size of our sample, the chi-squared statistic is overestimated and produces a false positive (it indicates that there are significant discrepancies when in fact the other indices exceed the minimum threshold that guarantees the validity of the model). Therefore, the evidence obtained supports the construct validity of the BIAS-31.

3.2. Reliability Coefficients and Descriptive Statistics

Table 3 summarizes all the information regarding descriptive statistics and includes the internal consistency coefficients for each test dimension.

[Table 3 near here]

The results in Table 3 indicate that the BIAS-31 and its dimensions have satisfactory reliability indices. Therefore, the BIAS-31 scores are reliable. The analyses of criterion validity were also satisfactory, except for the Hits on Unbiased Declarations Detection dimension. In this case the low explained variance may indicate that even though unbiased arguments are being detected, the clinicians may not consider them adequate in the evaluation process. In any case, this indicator can be considered as control index and not as a psychometric scale to be interpreted individually.

3.3. Prevalence of Biases in Diagnostic Assessment

The results of the groups compared according to clinician specialty and the prevalence regarding bias avoidance and detection are shown in Table 4.

[Table 4 near here]

The results in Table 4 suggest that clinicians specializing in the field of psychiatry or forensic psychology are those who best detect bias in clinical decisions. The BAR indices indicate that between 41.2% and 55.8% of clinicians try to avoid biased clinical arguments. Similarly, the BDR index indicates that only 48.5% to 57.5% of clinicians are able to detect bias in diagnostic evaluation processes.

4. Discussion

The aim of this research was to provide a valid and reliable measure of the ability of clinicians (psychiatrists and psychologists) to detect bias in assessments and diagnostic decisions. Likewise, we also aimed to know how biases impact the clinical interview and what differences there were among the different specialties within the field of adult psychiatric care. The results showed evidence in favor of the validity and reliability of the BIAS-31 protocol. Forensic professionals were those who were best able to detect and avoid bias in clinical decisions. Overall, up to 57.5% of clinicians avoided and recognized biases in the clinical interview. The BIAS-31 results warn that there is still a very high percentage of professionals who may have difficulties in the prevention and identification of bias in clinical decisions.

4.1. Professional implications of the results

Regarding the prevalences obtained, it is important to take into account two observations: (1) what sources of information and diagnostic tools are used by mental health professionals to make reliable decisions regarding the disorder suffered by each patient? (2) What kind of training or competencies has the clinician learned to discriminate between the different diagnostic labels and to know how to make clinical decisions without fallacies or bias?

The use of reliable sources of information and instruments for clinical decision making is an essential practice in any medical discipline. In psychiatry and clinical psychology, the most frequent instruments commonly used in diagnostic interviews are based on self-report sources (Escolà-Gascón, 2021). Since a symptom cannot be observed directly and instrumentalization is needed to be able to detect and measure it, it is interesting to ask what kind of diagnostic tests could prevent the occurrence of biases. The clinical interview itself is already an instrumental technique that allows us to examine the symptoms suffered by the patient. Moreover, the biases present in the BIAS-31 dialogues (i.e., in the items) were extracted from conversations that took place during assessment interviews. This means that the biases that characterize the BIAS-31 items come from the clinical interview; thus, if the clinician does not know how to detect them and only uses "the clinical interview" as a source of information, he/she will probably make erroneous diagnostic decisions.

Many mental health professionals rely solely on clinical interviews to make diagnostic decisions (Bowes et al., 2020; Kazda et al., 2021). This can be considered reckless (Bhugra et al., 2011). If we consider that BIAS-31 biases can occur in any clinical interview (within the conditions that this research has been developed), the results of this research show that more than 40% of clinicians would make incorrect diagnostic decisions because they would not know how to identify biases. This extrapolation can be very worrying because it calls into question the effort made by some Spanish clinicians to avoid biases and errors of this type. Given this interpretation, we hypothesize that biases in clinical assessment could be reduced in two ways: (1) by adding new sources of reliable diagnostic information; and (2) by providing professionals with good competency training in clinical practice.

It should be noted that the number of years of clinical experience that each participant had in this research was recorded. In reality, the more years of clinical experience a professional has, the more knowledge and practice he or she should have and, thus, the less bias he or she should demonstrate in his or her clinical observations. In fact, when these counts were correlated with the number of hits on part 2 of the BIAS-31, it was found that there was a significant and positive linear relationship (Pearson's correlation coefficient= 0.387; $p<0.01$). When years of clinical experience was related to part 1 of the BIAS-31, the results were not significant, although decreasing trends were obtained between the two variables (Pearson∼-0.2 correlation coefficient). This information was not included in the results section because the only significant effects were observed between part 1 total scores and years of clinical experience. Therefore, we consider that these were not sufficiently consistent effects to expose them as significant results of this study.

Nevertheless, these simple correlations do allow us to make several recommendations for future research: since years of clinical experience alone do not effectively predict the clinician's ability to detect bias in diagnostic evaluations (0.387^2 explains less than 15% of the variance), it seems necessary to also analyze the quality of the clinical training received by medical and psychology students. Based on this idea, the following question can be asked: do current training programs include exercises or training exams that allow clinicians to detect and prevent biases?

4.2. Application and potential uses of BIAS-31 in the forensic field

One of the most tedious and delicate practices in forensic clinical evaluation is the development of expert counter-reports. The expert counter-report has multiple specific objectives, but its primary purpose is to replicate a previous expert evaluation report (usually constructed by another professional). Although replications are - or should be - justified by scientific evidence, clinical and diagnostic decisions are made by the practitioner (and not by what is scientifically published). Using the predominant scientific evidence to make decisions does not mean that this scientific evidence replaces the clinician's judgment. This has an essential implication: if forensic value judgment depends on the practitioner, scientific evidence should not be the only source of variability to be questioned and judged; the ability of the forensic practitioner to at least avoid making as few errors as possible should also be examined. This point is closely related to the use and application of BIAS-31. When a dispute prevails between two forensic evaluations (i.e., the forensic report requested by the defendant and the one that could be judicially requested by the prosecuting attorney), it is usually the examining magistrate who makes a final decision. The question here is: what sources of evidence are available to a judge to operationally assess which of the two evaluation reports to accept? Although the judge's decision is legally justified in law, it is not necessarily a scientific justification (and in this type of case it should be). Therefore, the BIAS-31 could be the assessment tool that would allow the forensic practitioner to prove that his or her inference errors (based on the theory of heuristic judgments and biases) are below what would be expected at the population level (i.e. at the average level). If errors are minimal (which would imply high scores on the BIAS-31), the interpretive inferences and conclusions that the forensic professional would reach in his or her reports should be more reliable and, consequently, more accurate and plausible within reality. In this way, the BIAS-31 could be the alternative tool for providing appropriate judgments.

It is crucial to know that the BIAS-31 should not be applied or used by any examining magistrate; we urge that the forensic professionals themselves, in addition to the psychometric evidence on the case being evaluated, should also provide a report on the profile of the BIAS-31's accuracy in their reports on what their margin of error is in their own decisions. This would have two very clear impacts: on the one hand, if the forensic professional detects that they have committed more biases than usual or expected according to the population average (this implies obtaining a very small score in part 2 of the BIAS-31), then they could redirect their forensic training courses or programs in such a way that they train this skill and reach effective decision-making processes. Conversely, if the forensic clinician scores very high on part 2 of the BIAS-31 he could attach the outcome profile as evidence that the decisions made in his forensic report are reliable. This would be a source of evidence attributed to the evaluator (and not to the assessed case), which would offer judges and respective authorities proof of the quality of the evaluative inferences made.

As prevention, we should point out that we are in the initial phase of the development of the BIAS-31. We should also warn that the correction of the BIAS-31 profile or results should not be self-applied (in other words, it should not be performed by the same professional to whom the test is applied); this means that, for ethical and deontological reasons, the forensic professionals who wish to use the BIAS-31 on themself should ask another professional (with no conflict of interest) to make an impartial correction of the results and certify the level of skill attributed estimated with this test. Achieving this ideal scenario is not easy, but this report is the first step we must take if we want BIAS-31 to continue to grow and be a useful source of evidence for other professionals.

4.3. Limitations and conclusions

A result that we did not expect to obtain is that the forensic clinic is the specialty that best allows the professional to detect possible biases in his or her clinical observations. Although we did not expect it, this result has a certain logic because forensic psychiatry or psychology is the only specialty in which the clinician invests more effort in evaluating the simulation or fraud of symptoms in the patient (this happens especially in the proceedings of judicial expertise requesting disability) (Escolà-Gascón, 2021). This reason may explain that certain clinicians acquire more appropriate skills that allow them to recognize their own biases more easily.

Therefore, should specific clinical fraud detection training be implemented in relation to the symptoms manifested by the patient in other specialties outside the forensic clinic?

Finally, to conclude the discussion, we should highlight two important limitations of this research. First, the analyses and results provide useful but still inconsistent information: the BIAS-31 is the first psychometric test that formally measures the clinician's ability to identify possible biases in their clinical observations. This means that there are still many psychometric properties of the BIAS-31 to be analyzed to ensure more externally valid interpretations of the results. For example, it would be useful to analyze the sensitivity and specificity of the cutoff point used to calculate BAR and BDR prevalences. It is possible that other test scores may provide more parsimonious and effective levels of sensitivity than the arithmetic mean-based threshold itself. Second, it is essential to remember that this research was carried out with clinicians residing only in Spain, so generalization of the results to other groups of professionals and populations from other cultures should be done with caution. It would be interesting to adapt the BIAS-31 to other languages to be able to compare the results and carry out a cross-cultural study.

In conclusion, this research offers the BIAS-31 as a valid and reliable instrument to measure, at both cognitive and noncognitive levels, the ability of mental health clinicians to detect, avoid and prevent biases in their diagnostic decisions. The results show that more than 40% of Spanish psychiatrists and psychologists have difficulties in clearly identifying the biases that occur in clinical assessment interviews. It seems advisable to implement training programs aimed at preventing bias in diagnostic decisions, both for psychiatrists and psychologists.

5. References

Ball, L., & De Neys, W. (2018). *Dual Process Theory 2.0*. Taylor & Francis Group. https://doi.org/10.4324/9781315204550

Beck, A. , Hollon, S. D., Young, J. E., Bedrosian, R. C., & Budenz, D. (1985). Treatment of depression with cognitive therapy and amitriptyline. *Archives of General Psychiatry, 42*(2), 142. https://doi.org/10.1001/archpsyc.1985.01790250036005

Beck, A. T., Rush, A. J., Shaw, B. F., & Emery, G. (1987). *Cognitive therapy of depression*. The Guilford Press. https://www.routledge.com/Cognitive-Therapy-of-Depression/Beck-Rush-Shaw-Emery/p/book/9780898629194

Berthet, V. (2021). The measurement of individual differences in cognitive biases: A review and improvement. *Frontiers in Psychology*, *12*, 630177. https://doi.org/10.3389/fpsyg.2021.630177

Bhugra, D., Easter, A., Mallaris, Y., & Gupta, S. (2011). Clinical decision making in psychiatry by psychiatrists. *Acta Psychiatrica Scandinavica*, *124*(5), 403–411. https://doi.org/10.1111/j.1600-0447.2011.01737.x

Bowes, S., Ammirati, R., Costello, T., Basterfield, C., & Lilienfeld, S. (2020). Cognitive biases, heuristics, and logical fallacies in clinical practice: A brief field guide for practicing clinicians and supervisors. *Professional Psychology Research and Practice, 51*(5), 435–445. https://doi.org/10.1037/pro0000309

Cohen, J. M., & Burgin, S. (2016). Cognitive biases in clinical decision making: a primer for the practicing dermatologist. *Jama Dermatology*, *152*(3), 253-254. http://dx.doi.org/10.1001/jamadermatol.2015.3395

Cook, S., Schwartz, A., & Kaslow, N. (2017). Evidence-based psychotherapy: Advantages and challenges. *Neurotherapeutics*, *14*(3), 537–545. https://doi.org/10.1007/s13311-017-0549-4

Covin, R., Dozois, D., Ogniewicz, A., & Seeds, P. (2011). Measuring cognitive errors: Initial development of the cognitive distortions scale (CDS). *International Journal of Cognitive Therapy*, *4*(3), 297–322. https://doi.org/10.1521/ijct.2011.4.3.297

Croskerry, P. (2003). The importance of cognitive errors in diagnosis and strategies to minimize them. *Academic medicine*, *78*(8), 775-780.

Escolà-Gascón, Á. (2020). Researching unexplained phenomena II: New evidences for anomalous experiences supported by the multivariable multiaxial suggestibility inventory-2 (MMSI-2). *Current Research in Behavioral Sciences*, *1*, 100005. https://doi.org/10.1016/j.crbeha.2020.100005

Escolà-Gascón, Á. (2021). New techniques to measure lie detection using COVID-19 fake news and the multivariable multiaxial suggestibility inventory-2 (MMSI-2). *Computers in Human Behavior Reports*, *3*, 100049. https://doi.org/10.1016/j.chbr.2020.100049

Escolà-Gascón, Á., Dagnall, N., Gallifa, J. (2021). Critical thinking predicts reductions in Spanish physicians' stress levels and promotes fake news detection. *Thinking Skills and Creativity*, *74*, 100934. https://doi.org/10.1016/j.tsc.2021.100934

Galanter, C., & Patel, V. (2005). Medical decision making: A selective review for child psychiatrists and psychologists. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *46*(7), 675–679. https://doi.org/10.1111/j.1469-7610.2005.01452.x

Hansson, S. (2004). Fallacies of risk. *Journal of Risk Research*, *7*(3), 353–360. https://doi.org/10.1080/1366987042000176262

Hemmat, S., & Santhosh, L. (2020). Diagnostic error and anchoring bias in a patient with schizophrenia. *The American Journal of Medicine, 133*(3), 98–99. https://doi.org/10.1016/j.amjmed.2019.08.030

Hussain, A., & Oestreicher, J. (2018). Clinical decision-making: heuristics and cognitive biases for the ophthalmologist. *Survey of ophthalmology, 63*(1), 119-124. https://doi.org/10.1016/j.survophthal.2017.08.007

Imai, M., Murai, C., Miyazaki, M., Okada, H., & Tomonaga, M. (2021). The contingency symmetry bias (affirming the consequent fallacy) as a prerequisite for word learning: A comparative study of pre-linguistic human infants and chimpanzees. *Cognition*, *214*, 104755. https://doi.org/10.1016/j.cognition.2021.104755

Jones, E., & Sharpe, L. (2017). Cognitive bias modification: A review of meta-analyses. *Journal of Affective Disorders*, *223*, 175–183. https://doi.org/10.1016/j.jad.2017.07.034

Kahneman, D. (2011). *Thinking, fast and slow.* Penguin Books.

Kassirer, J., & Kopelman, R. (1989). Cognitive errors in diagnosis: Instantiation, classification, and consequences. *The American Journal of Medicine*, *86*(4), 433–441. https://doi.org/10.1016/0002-9343(89)90342-2

Kazda, L., Bell, K., Thomas, R., McGeechan, K., Sims, R., & Barratt, A. (2021). Overdiagnosis of attention-deficit/hyperactivity disorder in children and adolescents. *JAMA Network Open*, *4*(4), e215335. https://doi.org/10.1001/jamanetworkopen.2021.5335

Kliegr, T., Bahník, Š., & Fürnkranz, J. (2021). A review of possible effects of cognitive biases on interpretation of rule-based machine learning models. *Artificial Intelligence, 295*, 103458. https://doi.org/10.1016/j.artint.2021.103458

Kline, P. (2013). *Handbook of psychological testing*. Routledge. https://doi.org/10.4324/9781315812274

Leonardi, J., Gazzillo, F., & Dazzi, N. (2021). The adaptive unconscious in psychoanalysis. *International Forum of Psychoanalysis*, *31*(4), 201-217. https://doi.org/10.1080/0803706x.2021.1893382

Matute, H., Blanco, F., Yarritu, I., Díaz-Lago, M., Vadillo, M., & Barberia, I. (2015). Illusions of causality: How they bias our everyday thinking and how they could be reduced. *Frontiers in Psychology, 6*, 888. https://doi.org/10.3389/fpsyg.2015.00888

Mendel, R., Traut-Mattausch, E., Jonas, E., Leucht, S., Kane, J., Maino, K., Kissling, W., & Hamann, J. (2011). Confirmation bias: Why psychiatrists stick to wrong preliminary diagnoses. *Psychological Medicine, 41*(12), 2651–2659. https://doi.org/10.1017/S0033291711000808

Norman, G., Monteiro, S., Sherbino, J., Ilgen, J., Schmidt, H., & Mamede, S. (2017). The causes of errors in clinical reasoning. *Academic Medicine : Journal of the Association of American Medical Colleges, 92*(1), 23–30. https://doi.org/10.1097/ACM.0000000000001421

Pennycook, G., Neys, W., Evans, J., Stanovich, K., & Thompson, V. (2018). The mythical dual-process typology. *Trends in Cognitive Sciences*, *22*(8), 667–668. https://doi.org/10.1016/j.tics.2018.04.008

Ricco, R. (2007). Individual differences in the analysis of informal reasoning fallacies. *Contemporary Educational Psychology, 32*(3), 459–484. https://doi.org/10.1016/j.cedpsych.2007.01.001

Ross, R., Hartig, B., & McKay, R. (2017). Analytic cognitive style predicts paranormal explanations of anomalous experiences but not the experiences themselves: Implications for cognitive theories of delusions. *Journal of Behavior Therapy and Experimental Psychiatry, 56*, 90–96. https://doi.org/10.1016/j.jbtep.2016.08.018

Schiff, G. (2008). Minimizing diagnostic error: The importance of follow-up and feedback. *The American Journal of Medicine, 121*(5), S38–S42. https://doi.org/10.1016/j.amjmed.2008.02.004

Srivastava, A., & Grube, M. (2009). Does intuition have a role in psychiatric diagnosis? *The Psychiatric Quarterly, 80*(2), 99–106. https://doi.org/10.1007/s11126-009-9094-6

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and Biases. *Science, 185*(4157), 1124-1131. https://doi.org/10.1126/science.185.4157.1124

The Jamovi Project. (2019). Developer's hub. Retrieved from https://dev.jamovi.org/. Accessed May 21, 2020.

van Eemeren, F. (2013). Fallacies as derailments of argumentative discourse: Acceptance based on understanding and critical assessment. *Journal of Pragmatics, 59*, 141–152. https://doi.org/10.1016/j.pragma.2013.06.006

Walton, D. (1999). The fallacy of many questions: On the notions of complexity, loadedness and unfair entrapment in interrogative theory. *Argumentation*, *13*(4), 379–383. https://doi.org/10.1023/A:1007727929716

Wagenmakers, E.-J., Wetzels, R., Borsboom, D., & van der Maas, H. L. J. (2011). Why psychologists must change the way they analyze their data: The case of psi: Comment on Bem (2011). *Journal of Personality and Social Psychology, 100*(3), 426-432. https://doi.org/10.1037/a0022790

Woods, J., & Walton, D. (2018). *Fallacies: Selected Papers 1972-1982*. De Gruyter Mouton. https://doi.org/10.1515/9783110816082

Table 1

Number of Clinicians According to Specialty and Descriptive Statistics of Sociodemographic Variables (Total N= 1069).

Variables	Groups	Type of professional		Adult clinic specialties		
		Psychiatrists	Psychologists	Forensic	Outpatients	Inpatients
Sex	Women	220 (69.4%)	542 (72.1%)	197 (68.9%)	348 (72.5%)	217 (71.6%)
	Men	97 (30.6%)	210 (27.9%)	89 (31.1%)	132 (27.5%)	86 (28.4%)
Autonomous community in which the participants resided (Spain)	Catalonia	99 (31.2%)	277 (36.8%)	97 (33.9%)	168 (35%)	111 (36.6%)
	Madrid	106 (33.4%)	239 (31.8)	75 (26.2%)	175 (36.5%)	95 (31.4%)
	Basque Country	56 (17.7%)	102 (13.6%)	43 (15%)	71 (14.8%)	44 (14.5%)
	Valencian Community	56 (17.7%)	134 (17.8)	71 (24.8%)	66 (13.8%)	53 (17.5%)
Years of clinical experience		M= 7.39 SD= 3.558	M= 7.46 SD= 3.662	M= 7.59 SD= 2.823	M= 7.17 SD= 3.726	M= 7.72 SD= 4.104
Age		M= 36.35 SD= 7.187	M= 36.29 SD= 7.275	M= 36.22 SD= 5.749	M= 35.60 SD= 7.071	M= 37.52 SD= 8.537
Total		317 (29.7%)	752 (70.3%)	286 (26.8%)	480 (44.9%)	303 (28.3%)

Note: M= mean; SD= standard deviation

.

Table 2

Goodness-of-fit Indices of the BIAS-31 Theoretical Model and the Independence Model.

Indices	Thresholds for accepting the adjustment (Kline, 2013)	Independence model values	Theoretical model values
χ^2	-	10,773.001	640.218
Critical level	-	-	<0.001
Normed χ^2	-	23.168	1.496
RMSEA	<0.05	0.144 (0.142-0.146)	0.022 (0.018-0.025)
AGFI	>0.8	0.339	0.957
PRATIO[a]	>0.8 or >0.9	1	0.920
CFI	>0.950	0	0.979
TLI	>0.950	0	0.978
IFI	>0.950	0	0.979
NFI	>0.9	0	0.941
RFI	>0.9	0	0.935
AIC	-	10,835.001	776.218
BIC	-	10,989.210	1114.482

Note: RMSEA= root mean square error of approximation; AGFI= adjusted goodness of fit index; PRATIO= Parsimony ratio; CFI= comparative fit index; TLI= Tucker-Lewis coefficient; IFI= incremental fit index; NFI= normed fit index; RFI= relative fit index; AIC= Akaike information criterion; BIC= Bayes information criterion.

a. The PRATIO index should be interpreted as the level of parsimony of the theoretical model. In the independence model it is 1 because parsimony is perfect.

Table 3

Descriptive Statistics of BIAS-31 Scores and Reliability Coefficients.

Variables Typical performance test (part 1, BIAS-31)	Total Means	SD	Minimum and Maximum scores	Cronbach's alpha	McDonald's omega	Kuder-Richardson's formula
Tautological Bias	3.92	2.687	0 - 32	0.853	0.853	N.A.
Presupposition Bias	3.4	2.221	0 - 28	0.774	0.776	N.A.
Bias of Confirmation	4.51	3.056	0 - 36	0.844	0.844	N.A.
Unbiased Declarations	5.16	2.399	0 - 28	0.876	0.877	N.A.
Total BIAS-31 (part 1)	61.61	12.402	0 - 124	0.861	0.863	N.A.
Optimal performance test (part 2, BIAS-31)				Criterion validity with the scales of part 1		
				Correlation	Explained variance	
Hits on Tautological Bias Detection	3.92	2.687	0 - 8	0.720	51.8%	0.826
Hits on Presupposition Bias Detection	3.40	2.221	0 - 7	0.632	39.9%	0.753
Hits on Bias of Confirmation Detection	4.51	3.056	0 - 9	0.677	45.8%	0.854
Hits on Unbiased Declarations Detection	5.16	2.399	0 - 7	0.315	10%	0.892

Total of hits on the BIAS-31 (part 2)	16.98	6.998	0 - 31	0.643	41.4%	0.878

Note: SD= standard deviation; N.A.= Not appropriate.

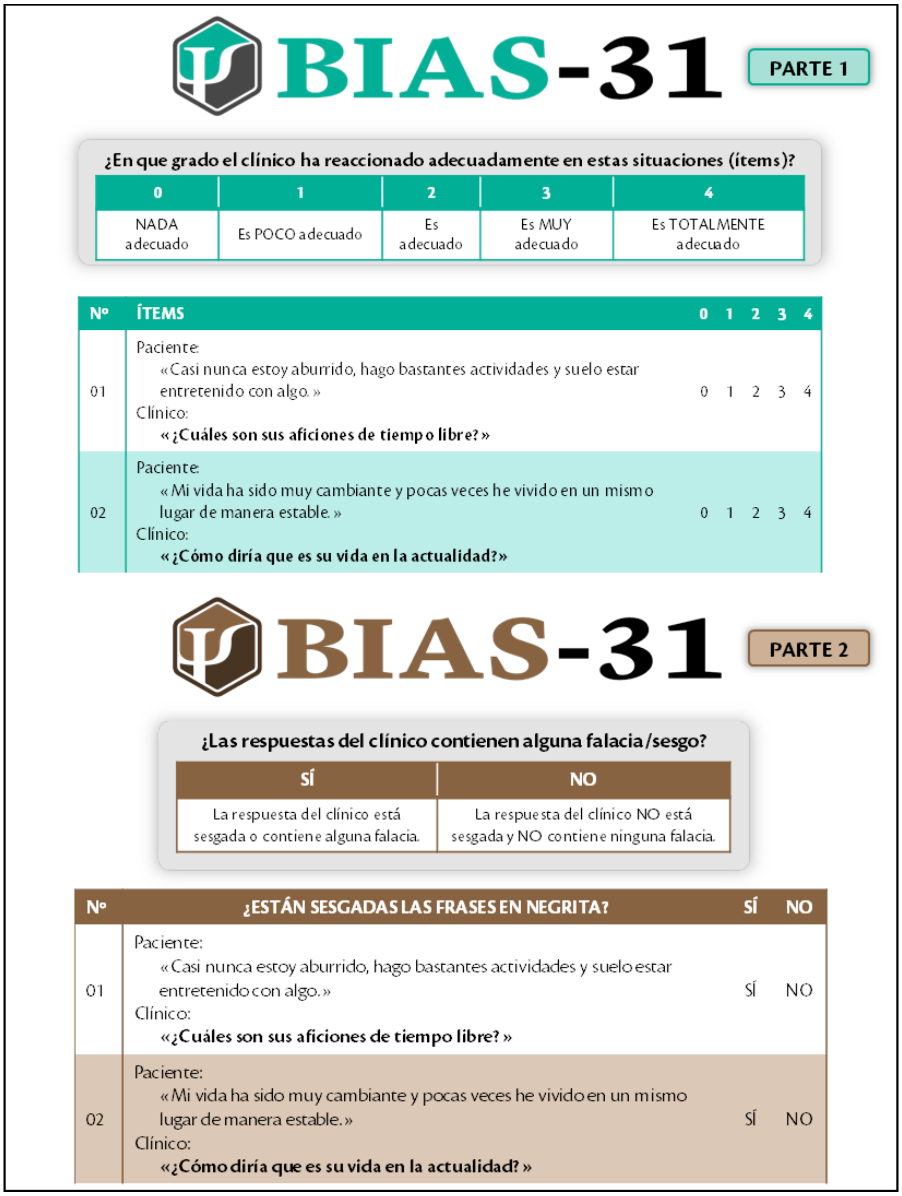
Table 4

Analysis of Variance Between the Different Specialties of Psychiatry and Clinical Psychology.

Scales	G	Means	SD	Fisher's F test	ω^2 (%)	Post Hoc Tests with Bonferroni's correction	Bias Avoidance Rate
Tautological Bias	F	13.18	5.702	51.097 <0.001*	8.6%	F vs. OP= <0.001* F vs. IP= <0.001* OP vs. IP= 0.008	596/1069*100 = 55.8%
	IP	16.29	5.810				
	OP	17.60	6.036				
Presupposition Bias	F	12.45	4.886	16.710 <0.001*	2.9%	F vs. OP= <0.001* F vs. IP= <0.001* OP vs. IP= 0.376	440/1069*100 = 41.2%
	IP	13.99	4.640				
	OP	14.54	5.023				
Bias of Confirmation	F	16.03	5.560	14.753 <0.001*	2.5%	F vs. OP= <0.001* F vs. IP= 0.002 OP vs. IP= 0.339	455/1069*100 = 42.6%
	IP	17.87	7				
	OP	18.61	6.442				
Unbiased declarations	F	15.72	6.301	19.075 <0.001*	3.3%	F vs. OP= <0.001* F vs. IP= 0.002 OP vs. IP= 0.054	-
	IP	14.03	5.917				
	OP	13.02	5.553				
Total BIAS-31 (part 1)	F	57.37	11.059	25.383 <0.001*	4.4%	F vs. OP= <0.001* F vs. IP= <0.001* OP vs. IP= 0.227	Not included[a]
	IP	62.18	11.845				
	OP	63.77	12.889				

							Bias detection rate
Hits on Tautological Bias Detection	F	5.47	2.473	75.891 <0.001*	12.3%	F vs. OP= <0.001* F vs. IP= <0.001* OP vs. IP= 0.008	615/1069*100 = 57.5%
	IP	3.06	2.532				
	OP	3.20	2.531				
Hits on Presupposition Bias Detection	F	4.9	2.099	26.469 <0.001*	4.5%	F vs. OP= <0.001* F vs. IP= <0.001* OP vs. IP= ≈1	518/1069*100 = 48.5%
	IP	3.19	2.146				
	OP	3.05	2.225				
Hits on Bias of Confirmation Detection	F	6.01	2.551	54.657 <0.001*	9.1%	F vs. OP= <0.001* F vs. IP= <0.001* OP vs. IP= 0.052	549/1069*100 = 51.4%
	IP	4.27	2.953				
	OP	3.76	3.086				
Hits on Unbiased Declarations Detection	F	5.77	1.983	13.670 <0.001*	2.3%	F vs. OP= <0.001* F vs. IP= <0.001* OP vs. IP= 0.783	-
	IP	5.06	2.494				
	OP	4.86	2.501				
Total of hits on the BIAS-31 (part 2)	F	21.43	6.154	96.587 <0.001*	15.2%	F vs. OP= <0.001* F vs. IP= <0.001* OP vs. IP= 0.025	Not included[a]
	IP	16.12	6.338				
	OP	14.87	6.677				

Note: *p<0.001; G= groups; F= Forensic; OP= Outpatients; IP=Inpatients.
a. The rate was not calculated because this variable includes unbiased declarations in the total scores.



BIAS-31 PARTE 1

¿En que grado el clínico ha reaccionado adecuadamente en estas situaciones (ítems)?

0	1	2	3	4
NADA adecuado	Es POCO adecuado	Es adecuado	Es MUY adecuado	Es TOTALMENTE adecuado

Nº	ÍTEMS	0	1	2	3	4
01	Paciente: «Casi nunca estoy aburrido, hago bastantes actividades y suelo estar entretenido con algo.» Clínico: **«¿Cuáles son sus aficiones de tiempo libre?»**	0	1	2	3	4
02	Paciente: «Mi vida ha sido muy cambiante y pocas veces he vivido en un mismo lugar de manera estable.» Clínico: **«¿Cómo diría que es su vida en la actualidad?»**	0	1	2	3	4

BIAS-31 PARTE 2

¿Las respuestas del clínico contienen alguna falacia/sesgo?

SÍ	NO
La respuesta del clínico está sesgada o contiene alguna falacia.	La respuesta del clínico NO está sesgada y NO contiene ninguna falacia.

Nº	¿ESTÁN SESGADAS LAS FRASES EN NEGRITA?	SÍ	NO
01	Paciente: «Casi nunca estoy aburrido, hago bastantes actividades y suelo estar entretenido con algo.» Clínico: **«¿Cuáles son sus aficiones de tiempo libre?»**	SÍ	NO
02	Paciente: «Mi vida ha sido muy cambiante y pocas veces he vivido en un mismo lugar de manera estable.» Clínico: **«¿Cómo diría que es su vida en la actualidad?»**	SÍ	NO

Figure 1

Image of the first two items of the two forms (part 1 and part 2) of the BIAS-31. The English translation of these items is provided below: 1) Patient: "I am almost never bored, I do quite a few activities and I am usually entertained by something". Clinician: "What are your leisure time hobbies?" 2) Patient: "My life has been very changeable and I have rarely lived in the same place in a stable way". Clinician: "What would you say your life is like today?"

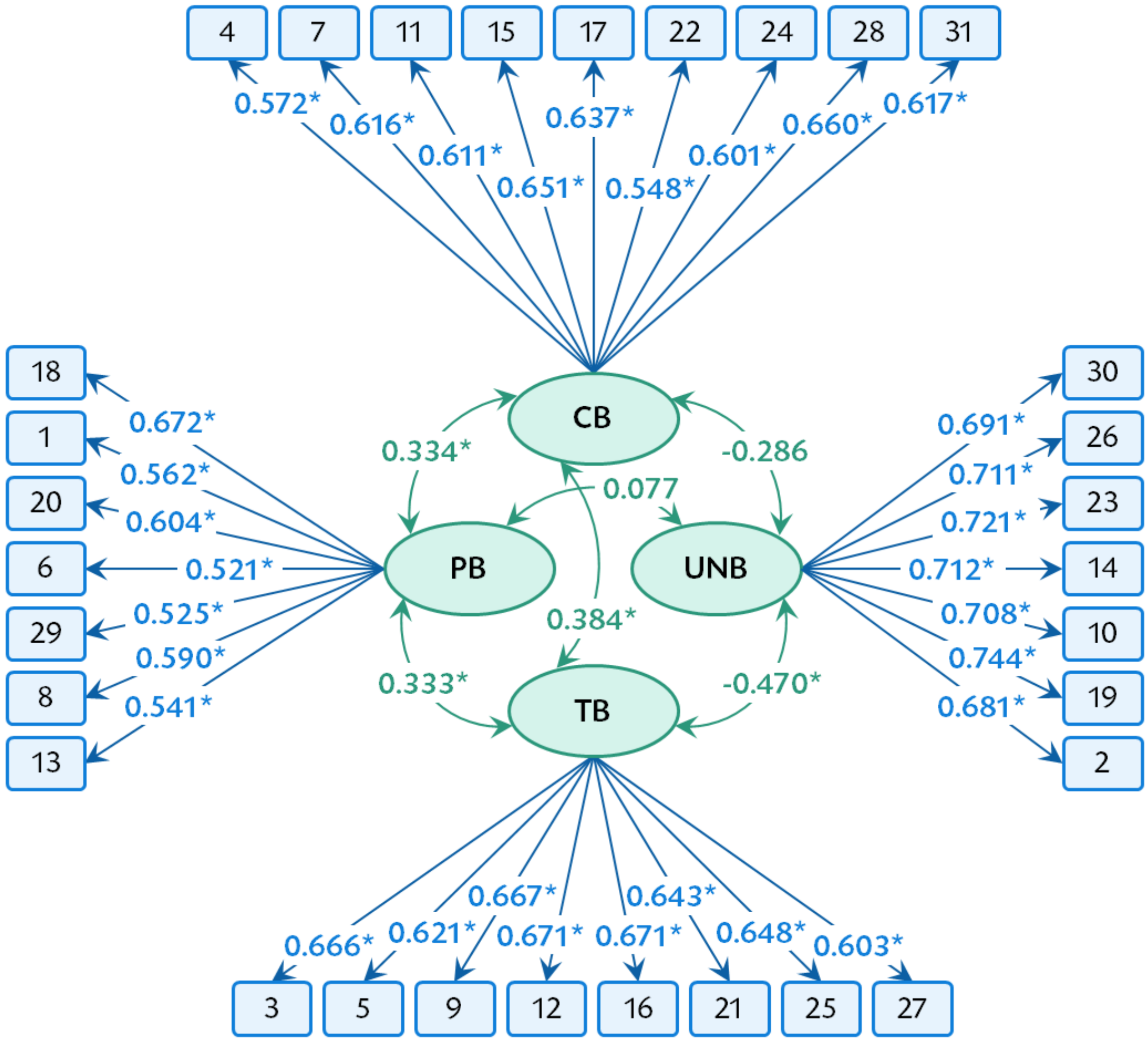


Figure 2

Theoretical Model of the BIAS-31 Scale, Regression Coefficients and Standardized Covariances Between the Specified Variables. The Asterisk Indicates that the Coefficients Differed from "0." TB= Tautological Bias; PB= Presupposition Bias; CB= Bias of Confirmation; UNB= Unbiased

View publication stats