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Hindsight Bias in Forensic Mental Health Novices and Experts: An Exploratory Study

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ABSTRACT

Decision-making processes are vulnerable to cognitive biases like hindsight bias, with particularly fateful consequences in forensic contexts. However, while debiasing strategies have been effective in various areas, their impact in forensics is underexplored. We investigated hindsight bias and a simple awareness-based debiasing strategy in novices (n = 52) and forensic professionals (n = 49). Participants were assigned to baseline, biased, or debiased conditions and rated an offender's risk of re-offending using case vignettes. Significant hindsight bias was found in novices, but not experts who were also more aware of biases. Debiasing proved effective in novices, indicating that raising awareness may enhance equitable forensic decision-making.

KEYWORDS

Cognitive bias; debiasing; risk assessment; expertise; recidivism

Human decision-making has been studied for decades, with the key finding that humans are inherently prone to mental shortcuts that allow for fast and automated action, but can also lead to suboptimal, biased decisions (Tversky & Kahneman, 1974). One of the several areas of human decision-making where the consequences of cognitive bias can be particularly severe is the forensic context: Forensic risk assessments by mental health professionals are used to make critical decisions concerning public safety and individual liberty, such as length of sentence, treatment resource allocation, and parole. A large body of research aimed at enhancing the validity of forensic risk assessments has focused on identifying evidence-based risk and protective factors that help to guide experts in making predictions (Desmarais & Zottola, 2020). In spite of

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this long research tradition, it appears that a ceiling effect has been reached in only moderate predictive accuracy of such forensic risk assessments (Coid et al., 2011; Fazel et al., 2022). At the same time, the field seems to be shifting focus to the assessor's role in the assessment process, that is, how cognitive biases affect decisions concerning justice-involved persons (Edens & Boccaccini, 2017).

Nonetheless, research on the role of cognitive biases within the forensic context remains sparse. A recent systematic review has identified only 23 studies in the past two decades that examined the presence and impact of bias in areas, such as forensic risk assessment (Neal et al., 2022). This gap has resulted in a call for novel research about cognitive biases and debiasing strategies specific to forensic practice (Gerth et al., 2022; Zapf & Dror, 2017).

Hindsight Bias

One cognitive bias with an extensive research base is *hindsight bias*, the belief that an event is more predictable after being informed about the outcome of the event compared to before the outcome became known (Fischhoff, 1975). For instance, after the results of an election have been announced, people tend to believe that they had seen it coming, although this was not the case (e.g., Pohl & Erdfelder, 2016). In the forensic field, for example, assessors from the general population were significantly more likely to rate adult-child interactions as indicative of child sexual abuse after they were told that the adult had subsequently been convicted of child sexual abuse (Scurich et al., 2023). The effect can be described as a feeling of "I knew it all along" (Roese & Vohs, 2012).

Such bias has been found across settings and samples, including in judges and psychiatrists asked about outcomes such as negligence, liability, or medical malpractice (Guthrie et al., 2001; Harley, 2007; Oeberst & Goeckenjan, 2016).

In forensic settings, it is common for not all available information to be taken into account, for example, information regarding the admissibility and evaluation of evidence in court. In such cases (potentially) risk-relevant information would be available, but its use may be considered unethical, prejudicial to the defendant, or misleading to the jury (e.g., Frank, 2016, regarding Federal Rule of Evidence 403). Most directly relevant to hindsight bias in forensic risk assessments are negligence assessments or so-called "Tarasoff-type cases" (LeBourgeois et al., 2007, p. 72), where an adverse event has already occurred and the jury – or a professional colleague – is asked to evaluate whether a therapists' actions were negligent. With regard to research methods, these studies often involve participants reviewing a hypothetical case vignette and then being asked to make judgments based on the information provided, with or without supplemental instructions that

would bias their judgments. Typically, these judgments are based on a risk assessment of a case at a point in time in the past when the actual outcome of the case could not possibly have been known and therefore cannot be part of the risk assessment (cf. Beltrani et al., 2018; LeBourgeois et al., 2007). Given the far-reaching consequences that the results of forensic risk assessments generally impose on the individuals assessed (Fazel et al., 2022) as well as on professionals who have been convicted of negligent conduct, which can even result in loss of license (Harley, 2007), it seems paramount that experts working in this field be aware of biases relevant to criminal justice processes, such as hindsight bias in order to avoid such biases and to protect individual rights as well as public safety (Neal et al., 2022).

A potential confounding factor in investigations of hindsight bias in forensic decision-making is participant expertise, specifically whether participants had substantial real-world experience working with the population represented by the hypothetical case vignette. The mitigating role of expertise on hindsight bias has been previously explored in non-forensic contexts. The evidence is mixed, with meta-analytic evidence suggesting no effect of expertise on hindsight bias (Guilbault et al., 2004). More recently, primary studies have found the experience to be associated with lower levels of hindsight bias (see Roese & Vohs, 2012), and others have found that experience magnifies hindsight bias (Knoll & Arkes, 2017). Thus, it seems worth further investigating expertise as a possible factor influencing susceptibility to hindsight bias.

Along this line, familiarity with forensic risk assessment among experts was found to affect hindsight bias. LeBourgeois et al. (2007) have compared psychiatrists with and without specialization in standardized forensic risk assessment as part of their professional training and found that the former were less prone to hindsight bias in their risk assessments. Consequently, specific forensic expertise might mitigate the influence of hindsight bias on risk assessments.

Debiasing

Debiasing refers to the systematic and intentional reduction of cognitive bias (Croskerry et al., 2013; Porta, 2016). Debiasing techniques can involve modifications to the decision-making *task*, the decision-making *process*, or – as we will focus on in the present study – modifications to the *person* making the decision (Fischhoff, 1982). In order to successfully modify a person's behavior in the context of bias, three criteria need to be met: (a) motivation to correct possible bias, (b) awareness of the direction and extent of their bias, and (c) ability to adjust to compensate for their bias (Wilson & Brekke, 1994). Debiasing strategies targeting the person can be categorized into cognitive (i.e., aiming to improve the individual's critical thinking skills), motivational (i.e., making an individual accountable for their decisions), or affective (e.g.,

inducing positive feelings in an individual if they choose to make a decision in a considered and balanced manner) approaches (Larrick, 2004; Ludolph & Schulz, 2018). Depending on the type of bias, specific debiasing strategies may be appropriate. Specifically, cognitive debiasing has succeeded against biases characterized by a "failure to know or to apply an explicit rule of inference" (Wilson & Brekke, 1994, p. 118). Consequently, cognitive approaches are considered best practice to counter hindsight bias, especially the "consider-the-opposite" strategy, which aims at raising a person's awareness of reasons that could cause their initial decision to be incorrect prior to making the decision (Larrick, 2004; Roese & Vohs, 2012).

Although over 400 studies investigating the effects of debiasing have been conducted across disciplines (Forscher et al., 2019), a recent systematic review by Neal et al. (2022) identified only two over the past 20 years examining the impact of debiasing techniques in forensic contexts, specifically (Griffith, 2019; Zappala et al., 2018). However, these studies used only forensic mental health experts as participants, with no non-expert comparison group. The first found that introspection alone was ineffective in reducing bias blind spot (Zappala et al., 2018). In contrast, the second found that employing the "consider-the-opposite" strategy proved successful in reducing confirmation bias (Griffith, 2019).

The present study

The aim of the present study was to use a forensic risk assessment case vignette to attempt to induce hindsight bias in inexperienced novices as well as in experienced forensic experts. In addition, we aimed to explore whether a simple cognitive debiasing strategy to raise awareness of hindsight bias in the specific task would mitigate hindsight bias in the two groups. The study is one of less than 15% of studies exploring debiasing efficacy across disciplines in a study population that is not exclusively composed of college students (cf. Forscher et al., 2019). It represents the first investigation of the prevalence of hindsight bias in forensic mental health experts in Switzerland. Finally, the present study aims to fill an existing research gap by examining hindsight bias and debiasing efficacy in a group of novices and forensic mental health professionals.

Materials and methods

Structured reporting checklist

The Checklist for Reporting Results of Internet E-Surveys (CHERRIES) Statement (Eysenbach, 2004), a 30-item checklist of survey characteristics,

was followed to enable a transparent and consistent reporting of study methodology and results.

Participants

The present study involved two groups: Novices and experts. The novices were first-year undergraduate students majoring in psychology at the University of Zurich (UZH) or the Zurich University of Applied Sciences (ZHAW) and had no experience in forensic practice. They were recruited via a participation invitation e-mail distributed via the mailing lists of the UZH Psychology Association and the ZHAW Curriculum Administrative Office for Psychology. The experts were currently licensed psychologists or psychiatrists who have either begun or completed postgraduate clinical training, with some of them having additionally specialized in forensics, and who had regular contact with adult forensic clients. The forensic expert who had testified in the actual criminal case was not included in this study. All experts were recruited using the same participation invitation e-mail that was sent to institutional administrators who distributed it internally at inpatient forensic-psychiatric institutions and private forensic practices in the German-speaking part of Switzerland, the forensic unit of the correctional facility Tegel in Germany, and the postgraduate training course in forensic psychology at the University of Konstanz in Germany. The participation invitation e-mails for both groups contained an active link to a digital survey hosted on Unipark (Questback, 2018). Data were collected between November 25, 2020, and January 21, 2021. No external incentives were offered for participation.

An *a priori* power analysis using G*Power (Faul et al., 2009) yielded a minimum sample size of 42 participants, assuming an achieved power of 0.8, a medium effect size, and two-tailed testing. We aimed to recruit 50 participants per study group to control for possible attrition. The active link in the participation invitation e-mails was clicked 455 times, with 101 participants (52 novices and 49 experts) completing the survey.[1] There were no statistically significant differences between the $n = 14$ participants who started to participate and who provided demographic information but did not finish it relative to the $n = 101$ participants who did finish the survey regarding age (Fisher's Exact Test, $p = .232$) and gender ($\chi^2(1) = 2.07$, $p = .150$). See Figure 1 for a diagram of the participant recruitment flow.

[1]An additional two participants were excluded after data inspection: They provided inconsistent information regarding their level of experience such that categorization as novice or expert was not possible.

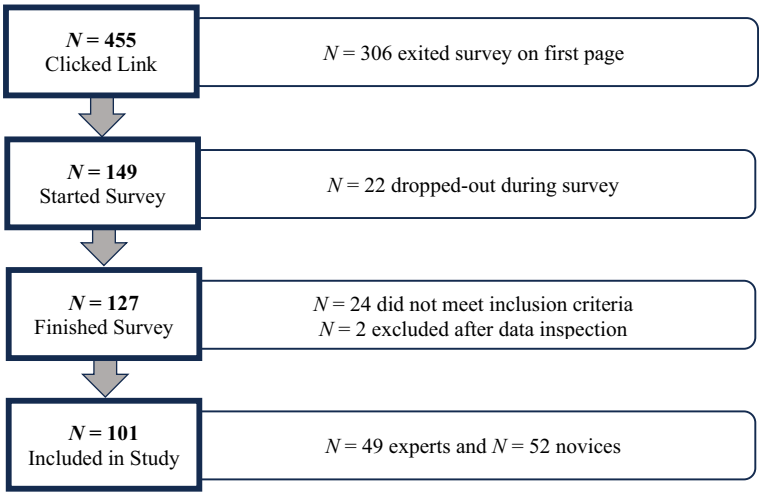

Figure 1. Diagram of participant recruitment flow for the present survey study.

Materials & procedure

The survey included closed-ended questions organized into three blocks, which were completed after informed consent was obtained: (1) sociodemographic characteristics, (2) case vignette, and (3) debriefing. First, in the sociodemographics block, participants were asked to classify themselves as either a novice or an expert. They were then asked about their gender, age group, and highest level of education. Participants who identified themselves as experts were also asked supplementary questions about the focus of their daily work, type of clinical workplace, type of everyday clinical work, years of working experience, and average workload.

Second, participants were presented with an anonymized case study which was condensed to half a page of text in the case vignette block. The key features of the case were changed to minimize the likelihood of it being recognized by participants. Case vignettes are commonly used to investigate hindsight bias in medical and law professionals (Berthet, 2022). They have recently been used to study hindsight bias in forensic contexts with nonprofessional adults (Scurich et al., 2023). Our case study described a young man convicted of the murder of his mother and who was depicted as presenting rather low risk for violent offending. Participants were instructed to assess his re-offense risk scale at the time of his release after having served his prison sentence. Ratings were made by moving the slider of a visual analog scale ranging between 0 ("no risk of re-offending") and 100 ("very high risk of re-offending").

Before ratings were entered, participants were randomly assigned to one of the three conditions: Participants in the baseline condition received no supplemental information concerning the young man. Participants in the "biased" condition received additional information

that the young man went on to commit a violent offense after his release. Finally, participants in the "debiased" condition received the same supplemental information as the participants in the "biased" condition but with the explicit instruction not to consider this additional information when making their risk rating because this outcome could not have been known at the time of assessment. Regardless of the condition, after risk ratings were submitted, participants were not allowed to return to the previous page of the survey.

Third, in the reflection block, participants were asked about their awareness of cognitive bias in forensic settings and were debriefed on the study rationale. They were also optionally asked to assess which of the three experimental conditions they were in.

Statistical analysis

Chi-squared tests were conducted to explore differences in gender, age category, and education level between the two study groups. Fisher's exact tests were used in cases where chi-squared test assumptions were not met. To investigate condition effects, multivariate linear regression analyses were conducted separately for novices and experts, including gender (reference category female) as a control variable. In these models, the condition was dummy-coded with baseline as the reference category. Coefficients of determination (R^2) were calculated for each regression model. Additionally, semipartial R^2 statistics (R^2_β) (determined using the r2glmm package in R; Jaeger, 2017) are reported as the effect sizes of all individual predictors. Finally, a sensitivity linear regression analysis, including age category, was conducted. Additional chi-squared tests were conducted to measure differences between the two study groups regarding their awareness of cognitive biases, differences in awareness among the three experimental conditions, and the proportion of participants who correctly identified the condition to which they had been assigned. All analyses were conducted in R Version 3.6.2 (R Core Team, 2019).

Ethics approval

All procedures were performed following the ethical standards of the ZHAW institutional research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. All research procedures complied with the ethical guidelines and legal basis of the Swiss Federal Data Protection Law. Informed consent was obtained from all participants included in the study. Participation was voluntary, no identifying information was collected, and participants were informed that their responses would be anonymous and that they could withdraw from the survey at any time.

Results

Sociodemographic characteristics

The sociodemographic characteristics of both the novice and expert groups are displayed in Table 1. In terms of gender, there was a significantly higher proportion of female versus male novices ($n = 42$, 80.77%) compared to female versus male experts ($n = 28$, 57.14%), $\chi^2(1) = 6.62$, $p = .008$).

Regarding the highest level of education, all but one novice ($n = 51$, 98.08%) had no higher education degree, with the remaining individual being a current student but having received a bachelor's degree in a subject other than psychology in the past. More than two-thirds of participating experts ($n = 34$; 69.39%) had completed postgraduate training in either clinical psychology or psychiatry, with about half of the psychologists ($n = 9$ of 20, 45.00%) and the majority of psychiatrists ($n = 10$ of 14, 71.43%) having an additional formal specialization in forensics. The remainder ($n = 15$, 30.61%) had completed a master's degree or above as their highest level of education. These differences in education level between the groups were significant (Fisher's Exact Test, $p < .001$).

Table 1. Characteristics of a sample of novices and experts ($N = 101$).

	Novices [*n* (%)]	Experts [*n* (%)]	*p*
Gender			.008
Female	42 (80.8)	28 (57.1)	
Male	9 (17.3)	21 (42.9)	
Non-binary	1 (1.9)	0 (0)	
Age Category			<.001
18-25 Years	41 (78.8)	1 (2.0)	
26-35 Years	9 (17.3)	21 (42.9)	
36-45 Years	2 (3.8)	8 (16.3)	
46-55 Years	0 (0)	10 (20.4)	
56-65 Years	0 (0)	9 (18.4)	
>65 Years	0 (0)	0 (0)	
Highest Level of Education			<.001
No Higher Education Degree	51 (98.1)	0 (0)	
Bachelor's Degree	1 (1.9)	0 (0)	
Master's Degree or Above[a]	0 (0)	15 (30.6)	
Clinical Psychologist[b]	0 (0)	11 (22.4)	
Clinical Forensic Psychologist[c]	0 (0)	9 (18.4)	
Clinical Psychiatrist[d]	0 (0)	4 (8.2)	
Clinical Forensic Psychiatrist[e]	0 (0)	10 (20.4)	
Randomly Assigned Condition			.694
Baseline	17 (32.7)	14 (28.6)	
Biased	19 (36.5)	22 (44.9)	
Debiased	16 (30.8)	13 (26.5)	
Awareness of Cognitive Bias[f,g]	19 (37.3)	40 (85.1)	<.001
Correct Identification of Study Condition[f]	19 (38.5)	25 (55.6)	.204

Notes. $n = 49$ experts, $n = 52$ novices.
[a]graduation in psychology or medicine, with current training in either clinical psychology or psychiatry; [b]psychologists w/completed postgraduate training; [c]psychologists w/completed postgraduate training, and additional formal specialization in forensics; [d]psychiatrists w/completed postgraduate training; [e]psychiatrists w/completed postgraduate training and additional formal specialization in forensics; [f]$n = 2$ missing values in the expert group; [g]$n = 1$ missing value in the novice group.

Table 2. Additional characteristics of the expert sample ($n = 49$).

	n (%)
Focus of Daily Work	
Mainly Research	3 (6.1)
Mainly Clinical	40 (81.6)
Approximately Half/Half	6 (12.2)
Workplace[a]	
Mainly in an Institution	39 (84.8)
Mainly in Private Practice	5 (10.9)
Approximately Half/Half	2 (4.3)
Type of Daily Work[a]	
Therapy	26 (56.5)
Expert Opinion	8 (17.4)
Approximately Half/Half	12 (26.1)
Working Experience	
0-2 Years	10 (20.4)
3-6 Years	15 (30.6)
7-9 Years	6 (12.2)
10-15 Years	9 (18.4)
>16 Years	9 (18.4)
Average Workload	
≤40%	3 (6.1)
41-69%	3 (6.1)
70-100%	43 (87.8)

[a]$n = 46$ experts whose focus of daily work was either mainly clinical or approximately half/half between research and clinical work.

Participants' age categories aligned with their highest level of education: More than three-quarters of the novices ($n = 41$, 78.79%) were younger than 26 years, with the remainder being predominantly between the ages of 26–35 years ($n = 9$, 17.31%). In contrast, the age range among experts was more variable, with approximately half ($n = 22$, 44.90%) being at or below the age of 35 years, and the remainder ($n = 27$, 55.10%) being almost evenly divided between the higher age categories (36–45: $n = 8$, 16.33%, 46–55: $n = 10$, 20.41%, and 56–65 year: $n = 9$, 18.37%). The proportion of novices and experts in the different age categories was significantly different (Fisher's Exact Test, $p < .001$).

The expert group was asked supplemental questions about the nature of their current work (see Table 2). The majority of experts spent 50% or more of their working time on clinical work, mostly providing therapy at an institution. Less than half of the experts had over 6 years of working experience and a substantial majority had a current workload between 70% and 100%.

Case vignette risk ratings

The proportion of novices and experts who were assigned to the baseline, biased, and debiased conditions did not differ between groups, $\chi^2(2) = 0.73$, $p = .694$. Refer to Table 1 for additional details. Among participants in the baseline condition, the average re-offense risk rating by novices was 57.35%

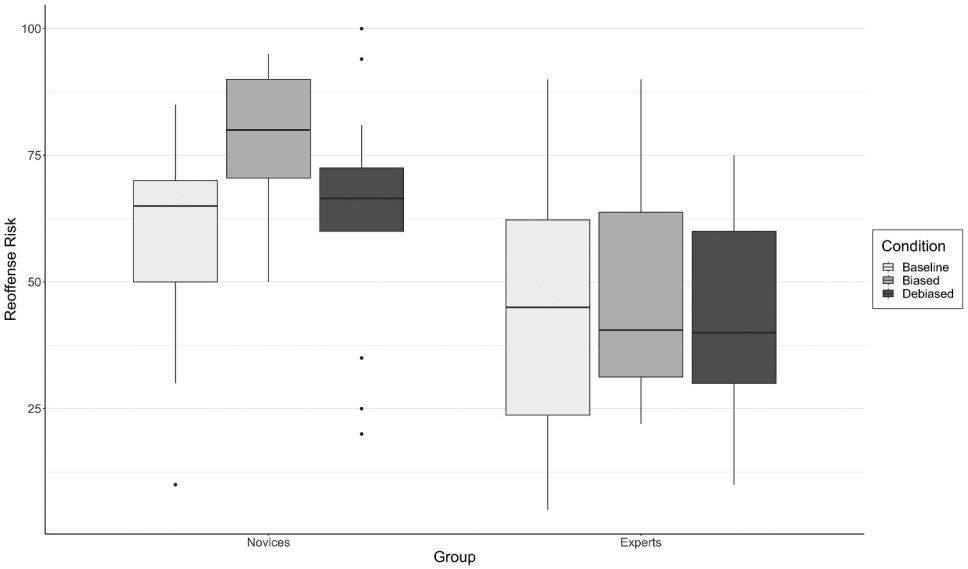

Figure 2. Box-and-whisker plot of re-offense risk ratings by group and condition.

(*SD* = 20.59, range = 10–85) compared to 44.64% (*SD* = 24.99, range = 5–90) by experts. For participants in the biased condition, the average re-offense risk rating by novices was 78.47% (*SD* = 12.18, range = 50–95) compared to 49.73% (*SD* = 21.17, range = 22–90) by experts. In participants in the debiased condition, the average re-offense risk rating by novices was 63.94% (*SD* = 21.92, range = 20–100) compared to 45.23% (*SD* = 19.81, range = 10–75) by experts. For a graphical representation of the re-offense risk ratings of the two groups and the three conditions, see Figure 2.

Multivariate linear regression analyses

In novices, the regression analysis revealed that participants in the biased condition rated the re-offense risk as higher than participants in the baseline condition ($\beta = 22.22$, $SE = 6.00$, $p < .001$, $R^2_\beta = .22$). In contrast, participants in the debiased condition provided similar ratings compared to the ones in the baseline condition ($\beta = 5.93$, $SE = 6.24$, $p = .347$, $R^2_\beta = .02$), see Table 3. In

Table 3. Results of a multivariate linear regression analysis exploring the prediction of case vignette re-offense risk in novices.

	β	*SE*	*t*	*p*	R^2_β
(Intercept)	59.592	4.485	13.287	<.001	
Condition: Biased	22.221	6.002	3.702	<.001	.22
Condition: Debiased	5.931	6.244	0.950	.347	.02
Gender: Non-female	12.689	6.368	1.993	.052	.08

Notes. The dependent variable of this analysis was assessed recidivism risk (0%-100%) from the vignette. Condition was dummy coded with reference category baseline. R^2 of the model was .26.

Table 4. Results of a multivariate linear regression analysis exploring the prediction of case vignette re-offense risk in experts.

	β	*SE*	*t*	*p*	R^2_β
(Intercept)	43.865	6.544	6.703	<.001	
Condition: Biased	5.037	7.596	0.663	.511	.01
Condition: Debiased	0.668	8.560	0.078	.938	.00
Gender: Non-female	−1.816	6.423	0.283	.779	.00

Notes. The dependent variable of this analysis was assessed recidivism risk (0%–100%) from the vignette. Condition was dummy coded with reference category baseline. R^2 of the model was .01.

experts, participants in both the biased and the debiased condition provided comparable ratings to the ones in the baseline condition (see Table 4). Given the low age variability for novices (see Table 1), sensitivity age analysis was only conducted for experts. A linear regression analysis including age, gender, and condition was conducted, and none of the variables reached significance (all $p > .100$).

Debriefing findings

When participants were asked about their awareness of cognitive bias in forensic settings, significantly more experts (85.11%) than novices (37.25%) were aware of such bias ($\chi^2(1) = 23.38$, $p < .001$). However, self-reported awareness did not differ between the three conditions, neither among novices ($\chi^2(2) = 1.39$, $p = .499$) nor experts (Fisher's Exact Test, $p = .780$). Also, when asked to estimate which study condition they had been assigned to (baseline, biased, debiased), there was no significant difference in accuracy between novices (38.46%) and experts (55.56%) ($\chi^2(1) = 1.61$, $p = .204$). Refer to Table 1 for additional details.

Discussion

Recent systematic review evidence suggests that decision-making processes involving justice-involved persons are vulnerable to cognitive biases, such as hindsight bias (Neal et al., 2022). Especially in negligence assessments, practical relevance of hindsight bias in the forensic context is persuasive. In general, all cases that involve outcome information that should not be taken into consideration might be prone to hindsight bias (e.g., Oeberst & Goeckenjan, 2016). Despite a comprehensive body of existing literature on the association between hindsight bias and expertise across professions, the question if expertise has any effect on hindsight bias and, if so, in which direction a possible effect works remains largely unanswered (Guilbault et al., 2004; Knoll & Arkes, 2017; Roese & Vohs, 2012). Likewise, existing studies examining the effect of hindsight bias on forensic risk assessments do not allow for comparisons between specialized practitioners and novices

(Beltrani et al., 2018; LeBourgeois et al., 2007). Hence, the present case vignette study aimed to explore the magnitude of hindsight bias when induced in a survey of novices in their first year of undergraduate studies who have no previous experience in forensic practice versus experts who do, as well as the differential impact of debiasing.

There were two main findings: First, when induced as part of the case vignette instructions, evidence of a significant hindsight bias in re-offense risk ratings was found among novices but not experts. This challenges existing literature reporting either non-effects or even magnifying effects of expertise on hindsight bias. The different design and operationalization of expertise of the present study compared to earlier studies may explain some of the contradictory findings. For example, prior research (Knoll & Arkes, 2017) found expertise to produce higher level of bias if it was experimentally induced by providing information regarding the topic of interest (study 1) or if it was operationalized as subjectively experienced knowledge based on participants' self-ratings (study 2). In a meta-analysis reporting no effect of expertise (Guilbault et al., 2004), the definition of expertise was based on participants' professional familiarity with the task of interest, albeit this was defined in a rather general way (e.g., physicians were considered experts if the task was about clinical diagnostics. However, physicians' daily work does not necessarily include diagnostics). Contrary to those studies, expertise in the present study was operationalized in a narrower sense as a highly specific professional activity so that experts differed from the comparison group by higher levels of specific practical experience in the field of the task (i.e., forensic risk assessment) going beyond the general knowledge that psychologists or psychiatrists have. In this light, our finding concords with that of LeBourgeois and colleagues (2007), who found that individuals belonging to professional organizations that encourage ongoing education and research in fields such as forensic psychiatry are notably less susceptible to hindsight bias. It is hypothesized that forensic mental health professionals' resilience to hindsight bias is that they routinely find their assessments subject to rigorous scrutiny by colleagues, lawyers, and judges (cf. LeBourgeois et al., 2007). Likewise, the mitigating effects of expertise on hindsight bias may operate in particular through the exposition to feedback (Roese & Vohs, 2012), which is, for example, ensured by professional associations responsible for the standardized professional training and certification of forensic experts in Germany (e.g., Müller & Saimeh, 2012) and Switzerland (e.g., SSFP – Swiss Society of Forensic Psychiatry, 2023; see also Gerth et al., 2022). Compared to the long research tradition on cognitive biases, the professionalization of forensic psychology, including specific training concepts, is a relatively new development (DeMatteo et al., 2009, 2015). This could explain why our study did show a mitigating effect of expertise on hindsight bias, contrary to prior studies that had been conducted in earlier decades involving forensic experts who might

not have received the same level of training during their postgradual education. In the present study, we also found that experts were significantly more aware of the role cognitive biases can play in forensic settings and had higher levels of education than novices. These factors could also contribute to the buffering effect. However, experts' resilience to bias, also reported by LeBourgeois et al. (2007), remains unclear, because other studies have demonstrated biases also in forensic mental health professionals (e.g. bias blind spot: Zappala et al., 2018; see; Neal et al., 2022, for an overview). Moreover, since we were unable to address the specific type or intensity of professional training due to insufficient sample size, future research should examine the length of domain-specific experience and postgraduate education of experts to better understand the level of expertise required to effectively counter hindsight bias and formulate recommendations for training. Additionally, due to the limited sample size, it was not possible to examine the effect of experts' occupation. For instance, future research could investigate whether there are any disparities between psychologists and psychiatrists in terms of their susceptibility to hindsight bias. Finally, additional nomothetic and idiographic research is needed to investigate why novices are more vulnerable to hindsight bias.

Second, our debiasing intervention was found to be effective in reducing hindsight bias in novices when induced. This intervention involved instructing readers of the case vignette that, although the released individual eventually re-offended, such information should not be considered when making a risk rating because this outcome could not possibly have been known when assessing his post-release risk. Thus, our debiasing strategy aimed to raise awareness of the cognitive bias present in the current task, and the given instructions proved effective in debiasing undergraduate college students. The findings of the present study furthermore corroborate past research indicating that interventions to reduce hindsight bias may be promising specifically in laypersons (i.e., in mock jurors but not in judges; Giroux et al., 2016) but are in contrast with recent research that could not find a debiasing effect of specialized training on hindsight bias among lay adults (Scurich et al., 2023). One reason why, in the present study, a debiasing effect was observed might be that the debiasing intervention was tailored to the specific task, and it was presented when participants were asked to make their risk assessment. Such a timely and task-specific intervention is shared with previous research that has successfully countered confirmation bias among forensic psychologists (Griffith, 2019). In prior studies that could not find such an intended effect among mental health professionals, debiasing was implemented by reading a text that called for increased general introspection and awareness of one's own susceptibility to bias (Zappala et al., 2018). In conclusion, the results of the present study suggest that laypersons may benefit from highlighting biases to increase their awareness and that domain- and task-specific debiasing training is particularly promising. Since hindsight bias was not observed among experts,

it is hypothesized that they may have internalized debiasing skills addressing awareness of such cognitive biases present in the context of forensic risk assessments during their professional specialization in forensic mental health.

Taken together, awareness of cognitive biases relevant to a forensic risk assessment task is supposed to be an effective prevention of hindsight bias, be it either experimentally induced among novices or internalized through specialization in forensic risk assessment.

Limitations

There were four key limitations of the present study. First, because we prioritized brevity in order to maximize the survey completion rate, only one case vignette was included. It is possible that participants in each of the three conditions, although randomly assigned, may have responded differently to case vignettes with different characteristics. Hence, future research should attempt to cross-validate our findings using multiple-case vignettes which vary according to parameters, such as index offense, race/ethnicity, age, and gender. Second, the two groups differed in several core features, such as age, gender, and education. Albeit controlling for those differences in the analyses, there may be other artifacts contributing to the observed results that were not possible to control for. Third, consistent with over 90% of the previous cognitive debiasing literature (cf. Forscher et al., 2019), the present study did not evaluate the impact of repetitive hindsight debiasing beyond a single experimental session and, thus, it remains unknown whether debiasing might sustainably reduce susceptibility. Past research has established the existence of an "elastic effect" whereby bias which has been reduced through a debiasing intervention returns gradually over time, unless that intervention is repeated (Gross, 2017). Therefore, future forensic studies should longitudinally examine the resilience of debiasing interventions across multiple timepoints. Fourth, although the case vignette used in the present study was based on a true crime, the hindsight bias intervention we used was not a real-world scenario, insofar as neither novices nor experts would have access to future outcome information if ever asked to make a high stakes prediction. Also, unlike real-world scenarios, the case vignette contained only a limited amount of information about the offender (approximately one page). More involved case vignettes that require more effort may provide greater opportunity for hindsight bias to operate.

Conclusion

Our study adds to the confirmatory literature suggesting a divergence in hindsight bias susceptibility between novices who have no previous clinical experience and experts who do, and it has extended these findings to the forensic mental health context. The results suggest that evidence-based cognitive debiasing strategies aimed at raising awareness of task-specific biases may be successful when

employed in individuals with no history of working clinically in forensic settings. It is hypothesized that such debiasing strategies may already be implemented in the postgraduate professional training of psychologists and psychiatrists working clinically with justice-involved persons, thus buffering hindsight bias. Taken together, awareness of domain- and task-specific cognitive biases may be successful in ensuring equitable decision-making processes within the criminal justice system. However, due to the limitations outlined above, the findings should be considered preliminary until independent cross-validation studies have replicated the results. Future research is needed to extend the knowledge on the presence and dynamics of hindsight bias in high stakes forensic predictions, including the most effective appropriate strategies of debiasing.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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References

Beltrani, A., Reed, A. L., Zapf, P. A., & Otto, R. K. (2018). Is hindsight really 20/20? The impact of outcome information on the decision-making process. *International Journal of Forensic Mental Health*, *17*(3), 285–296. https://doi.org/10.1080/14999013.2018.1505790

Berthet, V. (2022). The impact of cognitive biases on professionals' decision-making: A review of four occupational areas. *Frontiers in Psychology*, *12*, 802439. https://doi.org/10.3389/fpsyg.2021.802439

Coid, J. W., Yang, M., Ullrich, S., Zhang, T., Sizmur, S., Farrington, D., & Rogers, R. (2011). Most items in structured risk assessment instruments do not predict violence. *Journal of Forensic Psychiatry & Psychology*, *22*(1), 3–21. https://doi.org/10.1080/14789949.2010.495990

Croskerry, P., Singhal, G., & Mamede, S. (2013). Cognitive debiasing 1: Origins of bias and theory of debiasing. *BMJ Quality & Safety*, *22*(Suppl 2), ii58–ii64. https://doi.org/10.1136/bmjqs-2012-001712

DeMatteo, D., Burl, J., Filone, S., & Heilbrun, K. (2015). Training in forensic assessment and intervention: Implications for principle-based models. In R. Jackson & R. Roesch (Eds.), *Learning forensic assessment: Research and practice* (pp. 3–31). Routledge. https://doi.org/10.4324/9781315773377

DeMatteo, D., Marczyk, G., Krauss, D. A., & Burl, J. (2009). Educational and training models in forensic psychology. *Training and Education in Professional Psychology*, *3*(3), 184–191. https://doi.org/10.1037/a0014582

Desmarais, S. L., & Zottola, S. A. (2020). Violence risk assessment: Current status and contemporary issues. *Marquette Law Review*, *103*(3), 793–817. https://scholarship.law.marquette.edu/mulr/vol103/iss3/6/

Edens, J. F., & Boccaccini, M. T. (2017). Taking forensic mental health assessment "out of the lab" and into "the real world": Introduction to the special issue on the field utility of forensic assessment instruments and procedures. *Psychological Assessment*, *29*(6), 599–610. https://doi.org/10.1037/pas0000475

Eysenbach, G. (2004). Improving the quality of web surveys: The checklist for reporting results of internet e-surveys (CHERRIES). *Journal of Medical Internet Research*, *6*(3), e34. https://doi.org/10.2196/jmir.6.3.e34

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G* power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, *41*(4), 1149–1160. https://doi.org/10.3758/BRM.41.4.1149

Fazel, S., Burghart, M., Fanshawe, T., Gil, S. D., Monahan, J., & Yu, R. (2022). The predictive performance of criminal risk assessment tools used at sentencing: Systematic review of validation studies. *Journal of Criminal Justice*, *81*(101902), 101902–101909. https://doi.org/10.1016/j.jcrimjus.2022.101902

Fischhoff, B. (1975). Hindsight is not equal to foresight: The effect of outcome knowledge on judgment under uncertainty. *Journal of Experimental Psychology Human Perception and Performance*, *1*(3), 288–299. https://doi.org/10.1037//0096-1523.1.3.288

Fischhoff, B. (1982). Debiasing. In D. Kahneman, P. Slovic, & A. Tversky (Eds.), *Judgment under uncertainty: Heuristics and biases* (S. 422–444). Cambridge University Press.

Forscher, P. S., Lai, C. K., Axt, J. R., Ebersole, C. R., Herman, M., Devine, P. G., & Nosek, B. A. (2019). A meta-analysis of procedures to change implicit measures. *Journal of Personality & Social Psychology*, *117*(3), 522–559. https://doi.org/10.1037/pspa0000160

Frank, D. D. (2016). The proof is in the prejudice: Implicit racial bias, uncharged act evidence & the colorblind courtroom. *Harvard Journal on Racial & Ethnic Justice*, *32*(1), 1–49.

Gerth, J., Graf, M., & Weber, M. (2022). Kognitive Verzerrungen im forensischen Kontext: Zuverlässigere Risikobeurteilungen durch Debiasing? [Cognitive biases in forensic settings: More reliable risk assessments through debiasing?]. *Praxis der Rechtspsychologie*, *32*(1), 69–89. https://doi.org/10.51625/pdr20220103

Giroux, M. E., Coburn, P. I., Harley, E. M., Connolly, D. A., & Bernstein, D. M. (2016). Hindsight bias and law. *The Journal of Psychology*, *224*(3), 190–203. https://doi.org/10.1027/2151-2604/a000253

Griffith, R. L. (2019). *Forensic confirmation bias: Is consider-the-opposite an effective debiasing strategy?* [master's thesis]. Washburn University. https://hdl.handle.net/10425/1962

Gross, M. (2017). Can we change our biased minds? *Current Biology*, *27*(20), R1089–R1091. https://doi.org/10.1016/j.cub.2017.10.013

Guilbault, R. L., Bryant, F. B., Brockway, J. H., & Posavac, E. J. (2004). A meta-analysis of research on hindsight bias. *Basic and Applied Social Psychology*, *26*(2–3), 103–117. https://doi.org/10.1080/01973533.2004.9646399

Guthrie, C. P., Rachlinski, J. J., & Wistrich, A. J. (2001). Inside the judicial mind. *SSRN Electronic Journal*, *86*(4), 777–830. https://doi.org/10.2139/ssrn.257634

Harley, E. M. (2007). Hindsight bias in legal decision making. *Social Cognition*, *25*(1), 48–63. https://doi.org/10.1521/soco.2007.25.1.48

Jaeger, B. (2017). Computes R squared for mixed (multilevel) models. *R Package Version 01*, *2*, 1–12. https://CRAN.R-project.org/package=r2glmm

Knoll, M. A., & Arkes, H. R. (2017). The effects of expertise on the hindsight bias. *Journal of Behavioral Decision Making*, *30*(2), 389–399. https://doi.org/10.1002/bdm.1950

Larrick, R. P. (2004). Debiasing. In D. J. Koehler & N. Harvey (Eds.), *Blackwell handbook of judgment and decision making* (pp. 316–337). Blackwell Publishing. https://doi.org/10.1002/9780470752937.ch16

LeBourgeois, H. W., Pinals, D. A., Williams, V., & Appelbaum, P. S. (2007). Hindsight bias among psychiatrists. *The Journal of the American Academy of Psychiatry and the Law*, *35*(1), 67–73.

Ludolph, R., & Schulz, P. J. (2018). Debiasing health-related judgments and decision making: A systematic review. *Medical Decision Making*, *38*(1), 3–13. https://doi.org/10.1177/0272989X17716672

Müller, J. L., & Saimeh, N. (2012). Das DGPPN-Zertifikat Forensische Psychiatrie [The certificate for forensic psychiatry of the German association for psychiatry, psychotherapy and psychosomatics]. *Forensische Psychiatrie, Psychologie, Kriminologie*, *6*(4), 266–272. https://doi.org/10.1007/s11757-012-0187-y

Neal, T., Lienert, P., Denne, E., & Singh, J. P. (2022). A general model of cognitive bias in human judgment and systematic review specific to forensic mental health. *Law and Human Behavior*, *46*(2), 99–120. https://doi.org/10.1037/lhb0000482

Oeberst, A., & Goeckenjan, I. (2016). When being wise after the event results in injustice: Evidence for hindsight bias in judges' negligence assessments. *Psychology, Public Policy, & Law*, *22*(3), 271–279. https://doi.org/10.1037/law0000091

Pohl, R. F., & Erdfelder, E. (2016). Hindsight bias. In R. F. Pohl (Ed.), *Cognitive illusions: Intriguing phenomena in thinking, judging and memory* (pp. 424–445). Psychology Press. https://doi.org/10.4324/9781315696935

Porta, M. (2016). Debiasing. In M. Porta (Ed.), *A dictionary of epidemiology* (6 ed.). Oxford University Press. https://doi.org/10.1093/acref/9780199976720.001.0001

Questback. (2018). Unipark enterprise feedback suite survey. *Software*. Questback/Tivian XI GmbH. https://www.unipark.com/

R Core Team. (2019). R: A language and environment for statistical computing. *Software*. R Foundation for Statistical Computing. https://www.R-project.org/

Roese, N. J., & Vohs, K. D. (2012). Hindsight bias. *Perspectives on Psychological Science*, *7*(5), 411–426. https://doi.org/10.1177/1745691612454303

Scurich, N., Güney, Ş., & Dietz, P. (2023). Hindsight bias in assessing child sexual abuse. *Journal of Sexual Aggression*, *29*(1), 103–117. https://doi.org/10.1080/13552600.2022.2034999

SSFP – Swiss Society of Forensic Psychiatry. (2023). Curriculum Zertifikat Forensische Psychologie SGFP [Curriculum to acquire the certificate for forensic psychology by the SSFP]. access date: October 23, 2023. https://www.swissforensic.ch/forensische-psychologie/weiterbildung/curriculum

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases: Biases in judgments reveal some heuristics of thinking under uncertainty. *Science*, *185* (4157), 1124–1131. https://doi.org/10.1126/science.185.4157.1124

Wilson, T. D., & Brekke, N. (1994). Mental contamination and mental correction: Unwanted influences on judgments and evaluations. *Psychological Bulletin*, *116*(1), 117–142. https://doi.org/10.1037/0033-2909.116.1.117

Zapf, P. A., & Dror, I. E. (2017). Understanding and mitigating bias in forensic evaluation: Lessons from forensic science. *International Journal of Forensic Mental Health*, *16*(3), 227–238. https://doi.org/10.1080/14999013.2017.1317302

Zappala, M., Reed, A. L., Beltrani, A., Zapf, P. A., & Otto, R. K. (2018). Anything you can do, I can do better: Bias awareness in forensic evaluators. *Journal of Forensic Psychology Research and Practice*, *18*(1), 45–56. https://doi.org/10.1080/24732850.2017.1413532