Title

Regarding Champod, editorial: "Research focused mainly on bias will paralyse forensic science"

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Peer reviewed

Dear Dr. Barron,

Regarding Champod, editorial: "Research focused mainly on bias will paralyse forensic science."

In 2009, a report of the (U.S.) National Research Council declared that "[t]he forensic science disciplines are just beginning to become aware of contextual bias and the dangers it poses" [1]. The report called for additional research and discussion of how best to address this problem. Since that time, the literature on the topic of contextual bias in forensic science has begun to expand, and some laboratories are beginning to change procedures to address the problem. In his recent editorial in Science and Justice, Christophe Champod suggests that this trend has gone too far and threatens to "paralyse forensic science" [2]. We think his arguments are significantly overstated and deserve forceful refutation, lest they stand in the way of meaningful progress on this important issue.

Dr. Champod opens by acknowledging that forensic scientists are vulnerable to bias. He says that he does not "want to minimize the importance of [research on this issue] and how it contributes to a better management of forensic science…" He continues by asking "...but should research remain focused on processes, or should we not move on to the basic understanding of the forensic traces?" He then comments on risks of "being focused on bias only." By framing the matter in this way, Dr. Champod creates a false dichotomy, and implies facts about the current state of funding and research that are simply not the case. He seems to be saying that currently all or most research funding and publication is directed toward problems of bias, and little or none toward "basic understanding of the forensic traces." Dr. Champod should know this is not the case, however, since (among other things) he is a co-author of a marvelous recently-released empirical study on fingerprint analysis funded by the (U.S.) National Institute of Justice [3]. Any perusal of NIJ grants, or the contents of leading forensic science journals, would not support Dr. Champod's apparent view of the current research world.

It would of course be a mistake for all of the available funding for research on forensic science topics to be devoted to the potential effects of bias, but again, this is neither the case currently nor is it in our opinion likely to become the case in the future. To discuss the risks of focusing "on bias only," is simply raising a straw man when no one, not even the most ardent supporter of sequential unmasking or other approaches to the control of biasing information in forensic science practice, suggests focusing research "on bias only."

That said, we do believe that the research record both in forensic science and in a variety of other scientific areas has reached a point that clearly establishes the pressing need for all forensic areas to address the problem of contextual bias. As Andrew Rennison, who was then the forensic science regulator for England and Wales, told the plenary session of the American Academy of Forensic Science in February, "we don't need more research on this issue, what we need is action." This is not to say that further research on bias and its effects is not valuable, and

should not be appropriately supported, but merely that it is not required as a precursor to taking steps to control the pernicious effects of biasing information in practice.

Dr. Champod argues against taking such steps, however, claiming that bias reduction efforts create two risks. First, there is the "risk of the blind forensic scientist," which he explains as: "[t]he risk of enforcing the view that the forensic scientists should be detached, blind and immune from any external influences (especially from the inquiry)." In essence, he is concerned that forensic scientists will be isolated from investigators in ways that undermine their effectiveness in supporting criminal investigations. But his argument rests on the incorrect assumption that forensic scientists must choose to play only one of two possible roles—if they remain detached and blind (in order to insulate themselves from "external influences") then they cannot play the broader advisory role that Dr. Champod views as vital for effective investigations.

While Dr. Champod is correct that in a given case the two roles cannot be played by the same person, he fails to acknowledge the obvious response that *the two roles need not be played by the same person*. For example, it has been suggested that different forensic scientists in the individual case be assigned to two different roles: case managers and analysts [4-6]. Case managers would participate in investigations in the manner that Dr. Champod contemplates but would not conduct or interpret examinations themselves. Instead, they would screen the information that is passed to colleagues (analysts) who could thereby remain blind to potentially biasing contextual information while conducting examinations and issuing laboratory reports. A given forensic scientist could be a case manager, or an analyst, or could alternate between those roles (from case to case). We have argued on a number of occasions that separating functions in this manner would largely eliminate the "risk" that Dr. Champod associates with blinding procedures [4-6]. We are perplexed at his failure to address this key point in his editorial.

As Dr. Champod properly notes, there are two broad contexts in which questions can arise concerning what forensic scientists should know in order to do the job assigned to them: contexts in which the expert's conclusions may be used in court, and contexts (such as more generalized intelligence work) where the conclusions generated are unlikely to be so used. The latter is often the case, for example, in regard to computer forensics applications.

In the latter setting, it should be up to the investigating agency to determine the extent to which they want to turn their forensic experts into all-source experts (general detectives with an expertise component, if you will). In such cases there would be no direct implication for persons charged in a criminal proceeding, assuming the two contexts can be kept sufficiently separate. But it would be wise for whoever is leading such an intelligence operation to realize that using forensic scientists in this way might undermine the reliability of the domain-specific conclusions reached, thus impairing their utility in the more general inquiry.

In the context of any forensic science application where the results will be used as evidence in a legal case, however, and most certainly against a defendant in a criminal case, the

agency or laboratory responsible for the results as evidence is no longer free to make its own decisions about the costs and benefits of structuring the process one way or another. Opinions that are influenced by contextual information not relevant to the analyst's forensic expertise invade the province of the factfinder, and run the risk of factfinder confusion as to the scope of the forensic science expertise involved, and of double counting the domain-irrelevant information—counting it once as part of the hidden basis for the "expert" conclusion, and again by direct evaluation by the factfinder. In this context, the risk of error falls most heavily on the criminal defendant, and error reduction is a paramount concern. It is this focus that was properly the focus of the NRC report, and properly the focus of various calls for masking protocols to eliminate or control the effects of biasing information.

No one who has called for such bias reduction measures has sought to deprive forensic scientists of any information relevant to the exercise of their expertise. Indeed, the leading framework for control of biasing information, "sequential unmasking," explicitly builds into its two-stage process a filtration of domain-irrelevant information coupled with the release of domain-relevant information with the potential to induce bias in the least biasing order consistent with maximal accuracy [7]. Nor does this approach deprive law enforcement of investigatory guidance informed by forensic expertise. The control officer who does the filtration is also the interface with the "client" (usually law enforcement, but sometimes the defense), and can freely perform this function. But the forensic scientist doing the characterization and interpretation of the evidence in the individual case gives maximally accurate results concerning case-specific issues within their expert domain based only on domain relevant information released in the least biasing order. Forensic scientists owe the criminal justice system no less.

Dr. Champod also identifies a second risk, which he dubs "the risk of the black box expert." His concern, in essence, is that efforts to address contextual bias will somehow interfere with the efforts of forensic scientists to develop empirically-based match criteria that can be applied more objectively. In our view, this second "risk" is no risk at all. No one who calls for bias controls is in favor of using bias controls as an excuse not to improve the objectivity and diagnostic value of forensic science methods, or of depriving such efforts of funding. In fact, some of the leading exponents of sequential unmasking were present at the Royal Statistical Society when Cedric Neumann's foundational paper (co-authored with Evett and Skerrett) [8] on improvements in fingerprint methodology was read, and they published highly laudatory commentary upon it [9]. Ultimately research such as that, and the recent extension of it referenced above [3] co-authored with Neumann by Dr. Champod himself (along with Yoo, Gennesay and Langenburg) might someday in the distant future bring fingerprint identification to a point of such mathematized and mechanized perfection that the potential for contextual bias would be trivial. But in the here and now, fingerprint examination is not there yet, and none of the other pattern-matching disciplines are even close. Until then our choices are either to abandon such expertise wholesale (which is not going to happen, nor should it), or to do what we can to insure that their products proffered as evidence are as valid as possible. Protocols to

control biasing information are necessary for that, and will remain necessary for the foreseeable future. It is time for every current area of forensics to require the adoption of such standards. It would be hugely unfortunate if Dr. Champod's editorial became an excuse not to do so.

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