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Justice at risk! An evaluation of a pseudoscientific analysis of a witness' nonverbal
behavior in the courtroom

Vincent Denault

Université de Montréal, Canada

Centre d'études en sciences de la communication non verbale, Canada

Louise Marie Jupe

University of Portsmouth, United Kingdom

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Address for manuscript correspondence

Vincent Denault, Département de communication, Université de Montréal, Pavillon Marie-Victorin, PO Box 6128 Centre-ville STN, Montréal (Québec), H3C 3J7, Canada.
vincent.denault@umontreal.ca. + 1 514 240 9638.

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Abstract

Psychology and law have developed as disciplines through rigorous data collection, exploration and analysis, and the publication of findings through peer review processes. Such findings are then used to implement evidence based practices within a variety of settings. However, in parallel to factually and scientifically based knowledge, 'alternative' science, or pseudoscience, has gained in popularity. The present case study aims to evaluate the empirical evidence and theoretical underpinnings of a publically accessible analysis of a suspected serial killer's nonverbal behavior during a bond hearing published online by two 'synergologists' (Salvador & Gagnon, 2016). The case study emphasises how a 'synergological' analysis to understanding and interpreting human behaviour fails to use empirical data, making generalised inferences based on erroneous assumptions. The case study also highlights the detrimental effects such assumptions may have within the justice system and why pseudoscientific analytical approaches should be vigorously challenged by research scientists.

Keywords: synergology, behavioural analysis, pseudoscience, nonverbal communication.

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Justice at risk! An evaluation of a pseudoscientific analysis of a witness' nonverbal behavior in the courtroom

During trials, biases and stereotypes can have a detrimental effect on decision making processes (Englich, Mussweiler, & Strack, 2006), notably on the credibility assessment of witnesses (Porter & ten Brinke, 2009). This can ultimately affect the freedom of defendants (Bennett, 2017), even extending to whether they live or die (Wilson & Rule, 2015; Wilson & Rule, 2016). Since the nonverbal behavior of witnesses in courtrooms plays an important role in the assessment of their credibility by judges (or jurors depending on the jurisdiction) (Denault, 2015), the prevalence of false beliefs and pseudoscience, that is “disciplines that possess the superficial appearance of science but lack its substance” (Lilienfeld & Landfield, 2008, p. 1216), regarding nonverbal communication and deception detection can make it even more difficult for judges to accurately assess the credibility of witnesses. Therefore, it comes as no surprise that judges receive occasional training on nonverbal communication and deception detection (Denault, in press). However, what happens when such training includes pseudoscience? The popularity of synergology in Quebec, a province of Canada, offers some insights.

According to its proponents, synergology is a “discipline that enables us to decode gestures and decipher the workings of the human mind based on a person's body language in order to improve communication” (Gagnon, n.d.b). Synergology attributes different meanings or interpretations to several hundred nonverbal behaviors called ‘items’ (Salvador, n.d.; Monnin, 2009).

For example, using your right hand in a certain way when speaking is an ‘item’, and it is said to indicate control and confidence. Scratching your nose in a particular way

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is also categorised as an 'item', and its explanation is that you did not say something or you chose to keep something to yourself (Gagnon, 2016c). Presenting the left side of your face when speaking means that you create a bond with your audience (Gagnon, 2016a) and presenting the right side of your face whilst tilting your head to the right side indicates rigidity and distancing (Gagnon, Maisonneuve, Salvador, & Paré, 2016). The 'viper tongue' is another 'item': "What is a viper's tongue? It's when the tongue comes out and touches the center of the mouth very quickly, pointing forward as if it wanted to 'punch' the other. It's a movement of rejection or irritation" (Gagnon, 2016b).

Proponents of synergology stress that no conclusion should be made using only one 'item' (Gagnon, 2015d; Boyer, 2013a, Turchet, 2010) and that the observation of numerous 'items' allows them "to ask better questions, which in turn will direct us towards relevant information" (Gagnon, 2015c). Thus, the use of synergology during a police interview, for example, would not be to detect lies, but rather to obtain answers or confessions:

Let's not forget that gestures are useful indicators that allow us to ask better questions, not to detect lies. Questions create a chain reaction: The more you ask questions, the more the person moves and the more the person moves, the more information you gather; The right question is the one that moves the interview forward and creates the ideal conditions in order to obtain an answer or a confession. (Gagnon, 2015a)

In order to associate significance to 'items', proponents of synergology claim to have accumulated and compared thousands of television clips where people perform similar gestures in order to identify links between them (Boyer, 2014b; Betti-Cusso,

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2010; Jarry, 2016). However, the methodology to such accumulation and comparison is unknown because, apart from one publication where the founder of synergology analysed seven YouTube videos of two Canadian politicians (Turchet, 2013), meanings or interpretations associated with ‘items’, as well as other concepts specific to synergology, have never been peer reviewed (Denault, 2015; Denault, Larivée, Plouffe & Plusquellec, 2015) or no effect was found when assumptions promoted by proponents of synergology were experimentally tested (Delmas et al. 2016). Rather than submit their findings to the scrutiny of academic journal reviewers, ‘synergologists’, proponents of synergology with a training of approximately 200 hours in synergology (Lagacé, 2015a), conduct analysis within general public books, blog posts and media appearances accessible to anyone interested in synergology:

Who are the synergologists? Who uses synergology in their field? Doctors, neuropsychologists, psychologists, pharmacists, investigators, experts in economic fraud, special agents in high security, social case-workers, speakers, caregivers, business leaders, directors, intervieweurs (sic). Other users? Judges, lawyers, relationnists (sic) of various business circles, just to name a few.
(Gagnon, 2015d)

Despite the fact that such ideas specific to synergology lack any form of peer review, proponents of synergology describe it as a “science of observation” (Castets, 2010, our translation), a “scientific discipline” (Salvador, n.d., our translation) that “uses several revolutionary techniques and methods from the most recent discoveries in the field of behavioral sciences” (Gagnon, n.d.b), a discipline that is “based on a rigorous scientific approach” (Barreau du Québec, n.d.a, our translation), “of scientific and

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academic interest” (Gagnon, 2015b), and one that is “part of this line of sciences that seeks to understand every movement as an indicator of an unconscious mental process” (Monnin, 2009, our translation). Furthermore, organisations associated with the justice system have showed interest in synergology by offering and promoting training provided by ‘synergologists’ to their members.

For example, the Bar of Quebec, a professional corporation regulating the practice of law in Quebec, whose goal is to protect the public, offered an online training in synergology to approximately 2000 lawyers (Lagacé, 2015b). In that training, lying was notably associated with the face turned to the left and a closed mouth as well as crossed legs and crossed hands near the body (Barreau du Québec, n.d.a). According to another training offered by the Bar of Quebec, “a person who committed a crime and must answer a question on that subject will take 2 more seconds to answer the question” (Barreau du Québec, n.d.b, our translation) and truthfulness is associated with visible palms of the hands, moving hands, high gestures as well as the scratching on the front left side of the neck (Barreau du Québec, n.d.b). Numerous Quebec police officers, lawyers and decision makers from different courts and administrative tribunals have also attended conferences and seminars in synergology (Gagnon, n.d.a).

Thus, although the extent of the use of synergology is unknown, the analysis published online by ‘synergologists’ not only offer a significant informative insight into how ‘synergologists’ suggest using notions specific to synergology, but also, and more importantly, how Quebec police officers, lawyers and decision makers trained in synergology could be influenced by and facilitate the use of such notions in their practice.

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Furthermore, since professionals within the justice system are limited in their understanding of lie detection research (Strömwall & Granhag, 2003), psychological science (Kovera & McAuliff, 2000) and science in general (Kozinski, 2015; Chin & Dallen, 2016), and that false beliefs and pseudoscience regarding nonverbal communication and deception detection can have a detrimental effect on the decision making processes (Porter & ten Brinke, 2009; Denault, 2015), analysis published online by ‘synergologists’ should be taken seriously enough to undergo evaluations by research scientists, all the more considering a single pseudoscientific claim can influence important court decisions (Ellman & Ellman, 2015; Hamilton, 2017).

Therefore, the present case study aims to evaluate the empirical evidence and theoretical underpinnings of a publically accessible analysis of a witness’ nonverbal behavior in the courtroom published online by two ‘synergologists’ on the blog of the cofounder of the Quebec Institute of Synergology (Salvador & Gagnon, 2016) to determine the weight that should be given by judicial professionals to such analysis.

To achieve this objective, we will first describe the ‘synergological’ analysis of a suspected serial killer (Salvador and Gagnon, 2016). Subsequently, we will undertake a critical, in depth evaluation of the analysis to expose the scientific and logical inaccuracies. Finally, we will discuss the potential consequences of such an analysis on the credibility assessment of witnesses and, subsequently, on the outcome of trials. In addition, we will argue that the psychology and law research community should vigorously challenge pseudoscientific claims that pose a risk to the judicial system.

Case presentation

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On November 3rd, 2016, Todd Christopher Kohlhepp was arrested after a 30-year-old female that had been missing for just over 2 months, Kala Brown, was found chained in a container on his property (Sky News, 2016). Upon Kohlhepp's arrest, Brown indicated that she had witnessed Kohlhepp shoot and, subsequently, murder her boyfriend, Charles Carver (BBC News, 2016). The bodies of two other victims, husband and wife Johnny Joe Coxie and Meagan Leigh McCraw-Coxie, were also found on his property (Burns & Cary, 2016). In addition to the murder of Carver, Kohlhepp was also suspected of killing three males, Scott Ponder, Brian Lucas, and Chris Sherbert, and one female, Beverly Guy, inside a motorcycle shop in 2003 (Almasy, 2016). On November 6, 2016 Kohlhepp appeared at Spartanburg County Detention Center in South Carolina for bond hearing in relation to the four motorcycle shop killings (Burns, Cary, Connor, Eads, & Parrish, 2016). The analysis of Salvador and Gagnon (2016) focused on a 3 minute and 34 second video of the bond hearing published by the Independent Mail (Ruinard, 2016). Kohlhepp is seen from behind, in an orange jump suit, facing Judge Jimmy Hensen. Kohlhepp's facial expressions and hand movements are not visible within the video under analysis.

After a short summary of the case, Salvador and Gagnon (2016) explain that their analysis will be based on Kohlhepp's head positions because he "is handcuffed and cannot move as he listens to the recommendations from both the judge and prosecutor". Salvador and Gagnon (2016) go on to explain that synergology considers "the axis of the head as tridimensional: the sagittal axis, the lateral axis and the rotational axis". Each 'axis of the head' is related to a specific internal state:

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The rotational axis (the head turns to the left or to the right): position related to what is being said. The lateral axis (the head tilts to the left or to the right): position related to the relation with the other person. The sagittal axis (the head goes up or down): position related to the hierarchical relation. (Salvador & Gagnon, 2016)

Moreover, the three 'axis of the head' are each associated with three head positions and can be combined with one another, thus offering a total of 27 head positions to analyse. Salvador and Gagnon (2016) subsequently present their analysis. The first section focused on Kohlhepp's 'axis of the head' during the opening interactions with the judge, the second during the prosecutor's statements, and the third during the closing interactions with the judge. Based on their analysis, Salvador and Gagnon (2016) conclude that:

... the elements analysed from Todd Christopher Kohlhepp's non-verbal behavior demonstrates that he strategically favours a false empathic connection with the judge but that his real internal state is rather confrontational, marked by confidence and domination.

Finally, Salvador and Gagnon (2016) mention a peer reviewed publication from Livingstone and Palmer (2016) in a foot note. One can only assume this is to support their analysis.

Analysis

The opening interactions with the judge

In the first section of their analysis, Salvador and Gagnon (2016) claim that Kohlhepp is empathetic and listens to the judge because of his head position. However,

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according to Salvador and Gagnon (2016), Kohlhepp's head position is a deception strategy:

From the beginning of the video, we can see that Kohlhepp is empathic, listening to the judge. Indeed, the axis of his head is to the left and mirrors the judge (head falls towards the left shoulder - image 1) revealing a desire to keep in touch with him, demonstrating a certain empathic connection. In this situation, it is rather rare that a dangerous prisoner demonstrates this kind of positive relational connection with the person who could sentence him for life. It is therefore suggested that he is using this communication strategy "to win the favors" of the judge. (Salvador & Gagnon, 2016)

The allusion of Salvador and Gagnon (2016) to Kohlhepp's head position relates to mimicry (Chartrand & Lakin, 2013), that is the tendency to mimic the verbal and nonverbal behavior of others, a research subject studied extensively in psychology over the preceding decades (e.g., Schefflen, 1964; Condon & Ogston, 1971; LaFrance, 1985; Manusov, 1992; Van Baaren, Holland, Kawakami, & Van Knippenberg, 2004; Terven, Raducanu, Meza-de-Luna, & Salas, 2016). Research has suggested that mimicry, whether unconscious or conscious (Chartrand & Bargh, 1999; Sanchez-Burks, Bartel, & Blount, 2009), is generally associated with positive effects, notably greater liking, affiliation and rapport as well as persuasion and compliance (Gueguen, Jacob, & Martin, 2009; Frank, Yarbrough & Ekman, 2013), and better negotiation outcomes (Taylor & Thomas, 2008; Maddux, Mullen, & Galinsky, 2008). However, in this opening interaction, Kohlhepp is standing, hands behind his back, whilst the judge is seated in front and above, hands on a desk. There is very little in terms of mimicry which is reflected in their dyad, even with

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regards specifically to head positions. In other words, there is no behavior that appears to warrant the conclusion that “Kohlhepp is empathic, listening to the judge [...] revealing a desire to keep in touch with him, demonstrating a certain empathic connection”.

Moreover, even without mimicry, Kohlhepp’s head tilt to the left does not warrant such conclusion. Whilst the head tilted to one side, without differentiation from the left or the right side, has been associated to the expression of friendliness (McGrew, 1972; Troisi, 1999a; Troisi, 1999b), proponents of synergology assert that if the head of an individual falls toward the left shoulder, it is a sign of “empathy, listening, affection, well-being, submission” (Boyer, 2013b, p. 4, our translation), and toward the right shoulder, it is a sign of “control of the discourse, vigilance, unhappiness, analysis” (Boyer, 2013b, p. 5, our translation). Needless to say that the scientific literature does not offer evidence to supports such assertions. In addition, there is no comparison to his nor any innocent or guilty defendants baseline.

A baseline is used to assess an individual’s normal or common state of being before a test variable is introduced to a situation (Guerrero & Le Poire, 2005; Vrij, 2008). For there to be any indication that Kohlhepp’s head positions reflect a change of internal state, clear differentiations need to be made between his normal state and that during which he is said to be empathetic and listening to the judge. A baseline is, however, not a clear indication between truthful and deceptive ‘states’ (see Vrij, 2016). In Salvador and Gagnon (2016), there is no referral to Kohlhepp’s normal head position, be this pre or post bond hearing, nor to an objective evaluation of his internal state.

However, even if the previous issues alone are to question the value of the analysis, the final assertion of Salvador and Gagnon (2016), that a ‘dangerous prisoner’

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in a bond hearing rarely tilts his head to the left and mirrors the judge, lessens any remaining value of their analysis. Not only does no peer review publication support that assertion, but Salvador and Gagnon (2016) focused on the video of a bond hearing where a judge cannot sentence a defendant for life, although they assert otherwise. They use this assertion as a premise to their claim that Kohlhepp's head position is a deception strategy. Nevertheless, Salvador and Gagnon (2016) further claim a deceptive strategy by referring to Kohlhepp's head position in relation to his left shoulder:

This hypothesis has to be confirmed or countered by the other indicators on the body over the given period analysed (here, 3:53 in the video). Let's look at the internal state of Kohlhepp through microdetails. In his horizontal axis, we can see that his left shoulder is slightly higher than his right one, demonstrating an internal state of emotional stress. It is necessary to wonder if it seems heightened because of the head; However usually, if the head tilts to the left, the shoulder should be lower if the person feels relaxed, which is not the case here (Salvador & Gagnon, 2016).

There is little here to argue against the notion that Salvador and Gagnon (2016) are 'finding' results which fit their hypothesis, also known as data dredging or fishing (Van der Aalst, 2014). Such an approach throws the door wide open to confirmation bias (Nickerson, 1998). Moreover, since their 'hypothesis' lacks a factual and scientific basis, the observations that confirm their 'hypothesis' will only strengthen a baseless initial belief. During a trial, such a reasoning could have significant implications, and even lead to a miscarriage of justice (Findley, 2010; Leo & Davis, 2009). In other words, to stress that no conclusions should be made using only one 'item' (Gagnon, 2015d; Boyer, 2013a,

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Turchet, 2010) is meaningless if the ‘items’ monitored fall short of any empirical evidence.

In addition, even if the issue of a lack of baseline was resolved, and the foregoing concerns were addressed, there is no empirical evidence which supports claims that a left shoulder higher than the right shoulder demonstrate an internal state of ‘emotional stress’. Nor is there support that the ‘emotional stress’ is real because a head tilt to the left is usually associated with a lower left shoulder if a person is composed. Thus, the analysis of Salvador and Gagnon (2016) lacks a factual and scientific basis.

The prosecutor’s statements

In the second section of their analysis, Salvador and Gagnon (2016) continue to claim that Kohlhepp is deceptive because his head position changes when the judge stops looking at him:

When the judge gives the floor to the prosecutor and is no longer looking at the defendant, Kohlhepp’s head axis suddenly changes. He begins in a superior sagittal axis (Image 2), indicating challenge and domination, and ends up in a small external right lateral axis, expressing rigidity and an effort to distance himself from the prosecutor. This indicates a change in his communication strategy, going from a kind and pleasant syntonic (left lateral axis) to an untouchable conqueror (upper sagittal axis - 0:11) and ending as a vigilant (external right lateral axis - Image 3). More than once when the prosecutor has the floor, we see Kohlhepp raising his chin in challenge. At 1:06, when the judge starts speaking again, the defendant repositions his head in a left lateral axis, confirming his strategy of manipulation.

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Both the right lateral (1:45) superior sagittal axis (1:51) return when it's the prosecutor's turn to speak. (Salvador & Gagnon, 2016)

In the above statement, Salvador and Gagnon (2016) assume that Kohlhepp swings through numerous internal states, with an emphasis on a desire to manipulate the judge. However, the scientific literature does not offer evidence on the use of conscious slight shifts of the head for deception purpose (DePaulo, Lindsey, Malone, Muhlenbruck, Charlton & Cooper, 2003). Moreover, manipulative behaviour generally requires overt behaviour, such as lying, intimidation, violence, persuasive or coercive behaviour (Bowers, 2002), of which none is displayed within the video under analysis. The above statement also suggests that Kohlhepp shifts from 'kind and pleasant' to an 'untouchable conqueror', all within 11 seconds. Such radical shifts in communication strategies appear as a naïve reasoning.

Returning to the lack of baseline, even with some overt and measureable variables of cognition, which are not available, no comparisons were made between natural or common behaviours with that of displayed within the video under analysis. In other words, Salvador and Gagnon (2016) demonstrate a set of fairly definitive inferences drawn about Kohlhepp's internal states, based on a very small amount of data. Their claim that slight shifts to the head and approximately 15 words, spread over 6 responses, during the 3 minute and 34 second video, confirm a strategy of deception is no less than an 'extraordinary claim'. However, "the more extraordinary the claim, the more extraordinarily well-tested the evidence must be" (Shermer, 2002, p. 49), but Salvador and Gagnon (2016) not only lack extraordinarily well tested evidence, there is absolutely

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no evidence to support their claim, which suggests a deeply flawed analysis of a witness' nonverbal behavior in the courtroom.

The closing interactions with the judge

In the third and last section of their analysis, Salvador and Gagnon (2016) claim that Kohlhepp is deceptive because of a discrepancy between his heads positions and the vocalic of his voice:

When the judge asks the accused if he wants to say a few words, he replies: "not this time, Sir" by lowering the head, in inferior sagittal axis, sign of a low position and a desire to show that he does not feel at ease in the situation. This low position contrasts with the superior sagittal axis seen repeatedly, indicating the opposite of his real internal state, mainly that he is not afraid of words, nor of the reaction of others. When he answers the judge's questions, he speaks with a very low, almost whispered tone of voice. However, he marks his words at a much faster pace, indicating he is much more dynamic than his voice suggests; he controls himself in front of the judge, keeping a low profile. (Salvador & Gagnon, 2016)

It appears that the analysis by Salvador and Gagnon (2016) has one primary aim, that is to support the assumption that Kohlhepp is a 'dangerous prisoner' guilty of that which he is charged, a striking example of confirmation bias (Nickerson, 1998).

According to Salvador and Gagnon (2016), Kohlhepp lowers his head deliberately to signal that that he is not at ease. Whilst downward head positions can signal shame (Keltner & Harker, 1998; Wallbot, 1998) and embarrassment (Keltner, 1995; Keltner & Buswell, 1997), and serve as a submission display (Leary & Kowalski, 1995; Keltner &

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Anderson, 2000), it is impossible to know whether Kohlheep's downward head is deliberate or not. Nevertheless, according to Salvador and Gagnon (2016), Kohlheep's real internal state can be inferred by the fact that he keeps his chin up at certain moments within the video under analysis, which subsequently allows confirmation that his downward head movement is deliberate. However, inferring from his chin up that Kohlheep "is not afraid of words, nor of the reaction of others" is an abusive misinterpretation of scientific knowledge, notably that "perceived dominance is directly related to head angle" (Mignault & Chaudhuri, 2003, p. 124) and that "head angle is a status signal" (Mignault & Chaudhuri, 2003, p. 125), an inference all the more unjustifiable considering the lack of baseline.

Salvador and Gagnon (2016) also assert that a vocalic's discrepancy further confirm Kohlheep's deception strategy. That assertion not only takes no account of a baseline, but is based on approximately 15 words, which otherwise seems sufficient for Salvador and Gagnon (2016) to claim that Kohlheep is "not afraid of words". Based on their analysis, Salvador and Gagnon (2016) conclude that:

... the elements analysed from Todd Christopher Kohlhepp's non-verbal behavior demonstrates that he strategically favours a false empathic connection with the judge but that his real internal state is rather confrontational, marked by confidence and domination.

However, the conclusion of Salvador and Gagnon (2016) is totally at odds with 60 years of scientific knowledge about nonverbal communication and deception detection (Vrij, 2008; Burgoon, Guerrero & Floyd, 2010). As aforementioned, the scientific literature does not offer evidence on the use of conscious slight shifts of the head for

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deception purpose (DePaulo et al., 2003). Furthermore, the conclusion of Salvador and Gagnon (2016) is naïve to the general scientific understanding of observable human cognition; that is that cognition is predominantly immeasurable (Lewontin, 1998; Nisbett & Wilson, 1977) and draws upon nothing more than erroneous assumptions made by proponents of synergology. If a judge was to follow a reasoning as proposed by Salvador and Gagnon (2016), it would constitute a significant impediment to the effective functioning of a judicial proceeding.

It is worth noting that Salvador and Gagnon (2016) provide a foot note, without a direct citation within the text, which refers to a peer reviewed publication from Livingstone and Palmer (2016). The study empirically tests if intended emotions affect head movements and if such movements affect the emotion perceived by others. The emotions tested within the study are: a) very happy, b) happy, c) neutral, d) sad and e) very sad. However, there is no mention in the peer reviewed publication of any concept which could be closely related to the internal states of Kohlheep advocated by Salvador and Gagnon (2016). In fact, Livingstone and Palmer (2016) studied head movements during speech or song, and therefore there is little to no relation to the video under analysis, due to the limited number of verbal responses given by Kohlheep throughout the 3 minute and 34 second video.

Consequently, the reference to Livingstone and Palmer (2016) bears all the hallmark of a call to authority, a typical pseudoscientific logical fallacy (Shermer, 2002). Unless the reader has access to, and has read, Livingstone and Palmer (2016), the reader will likely expect that this reference supports the analysis of Salvador and Gagnon (2016) when, in fact, it does not in any way. Furthermore, the use of this reference by

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‘synergologists’ is very puzzling since the founder of synergology recently asserted that experimentations are of no use in synergology: “So what we absolutely do not believe in within synergology is experiment, because body language is made in such a way that when we participate in an experiment, it does not work” (Institut européen de synergologie, 2015, our translation).

Discussion

During trials, the credibility of witnesses is continuously assessed by judges (or jurors depending on the jurisdiction), a task that leads them to acknowledge the witnesses’ verbal and nonverbal behavior (Denault, 2015). However, whilst the Supreme Court of Canada explicitly mentions demeanor as a factor to establish the credibility of witnesses (R. v. D.A.I., 2012), as the United States Supreme Court did (Mattox v. United States, 1895; Coy v. Iowa, 1988), the precise way to assess the demeanor of witnesses is predominantly left to the judges’ discretion (R. v. Oickle, 2000). They can use their life experiences “so long as those experiences are relevant to the cases, are not based on inappropriate stereotypes, and do not prevent a fair and just determination of the cases based on the facts in evidence” (R. v. S. (R.D.), 1997, p. 501). However, Salvador and Gagnon (2016) promote the use of synergology to willfully analyse the nonverbal behavior of a defendant. This is not the first time that such a recommendation is made.

Whilst ‘synergologists’ are often active in terms of their analysis of politicians published online (e.g., Gagnon, 2016a; 2016b; 2016c; Cabot, 2016; Anglade, 2016; Boutin, 2017; Ropert, 2017; Bunard, 2017a; 2017b; 2017c), proponents of synergology occasionally conduct analysis within blog posts and media appearances on the nonverbal behavior of witnesses and defendants at different stages of the judicial process (e.g.,

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Desplanques, 2013; Boyer, 2016), including other ‘extraordinary claims’ about head movements such as in an analysis of the kidnapper Ariel Castro during a court appearance:

As the judge gives his first instructions, Castro moves his head surreptitiously, thus confirming that he understands very well what is being said. He most certainly has the capacity to analyze situations quickly; he is totally “in the moment” and very aware of what is going on (Gagnon, 2014).

However, no consideration should be given by judicial professionals to synergology if the analysis of Salvador and Gagnon (2016) represents the way synergology should be used in courtrooms.

Salvador and Gagnon (2016) focused on a 3 minute and 34 second video of the bond hearing of Todd Christopher Kohlhepp published by the Independent Mail (Ruinard, 2016), yet their analysis is riddled with a plethora of scientific and logical inaccuracies. Such errors begin with their own initial justification as to why their analysis is based upon Kohlhepp’s head positions, because he supposedly “is handcuffed and cannot move as he listens to the recommendations from both the judge and prosecutor” (Salvador & Gagnon, 2016). Thus, even before they start their analysis, Salvador and Gagnon (2016) make a totally unsubstantiated assumption that serves as the foundation of their analysis. A video of the full bond hearing clearly shows that Kohlhepp is not handcuffed and he can move to a certain extent (WSPA, 2016).

Moreover, the analysis of Salvador and Gagnon (2016) echos previous work labeling synergology as an ‘alternative science’, or pseudoscience (Denault, 2015; Denault, Larivée, Plouffe, & Plusquellec, 2015; Lardellier, 2008; Lardellier, 2017). Other

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than the utter lack of peer review publications to justify their analysis, the ‘extraordinary claims’ with no ‘extraordinary evidence’ and the call to authority, Salvador and Gagnon (2016) fail to implement safeguards against confirmation bias (Lilienfeld & Landfield, 2008) and ignore and misinterpret scientific knowledge (Larivée, 2014) regarding nonverbal communication and deception detection, key attributes of pseudoscientific analytical approaches. Given the above considerations alongside the attendance of synergology conferences and seminars by numerous Quebec police officers, lawyers and decision makers from different courts and administrative tribunals (Gagnon, n.d.a), even if Salvador and Gagnon (2016) was not, to our knowledge, used explicitly by a judge in Kohlheep’s case, just the possibility that judges in Canada or other countries could read and consider such an analysis a credible source on nonverbal communication raises serious questions.

According to the Supreme Court of Canada, for example, “judges must rely on their background knowledge in fulfilling their adjudicative function” (R. v. S. (R.D.), 1997, p. 505), including the credibility assessment of witnesses:

Credibility must always be the product of the judge or jury’s view of the diverse ingredients it has perceived at trial, combined with experience, logic and an intuitive sense of the matter [...]. Credibility is a matter within the competence of lay people. Ordinary people draw conclusions about whether someone is lying or telling the truth on a daily basis. (R. v. Marquard, 1993, p. 248)

However, even if the Supreme Court of Canada stresses that credibility assessment of witnesses should not be based on inappropriate stereotypes (R. v. S. (R.D.), 1997), the prevalence of false beliefs and pseudoscience regarding nonverbal

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communication and deception detection cast doubts on the accuracy of the knowledge of judges on such subjects based on their life experiences and, therefore on the accuracy of the credibility assessment of witnesses. For example, gaze aversion is all too often considered a sign of dishonesty (e.g., Bolduc c. Decelles, 2016; El Sewify c. Gestion Phoenicia inc., 2016), when in fact any association is faint and unreliable (DePaulo et al., 2003; Vrij, 2008). Combined with nervousness and hesitation, gaze aversion has contributed to the rejection of testimonies:

Having carefully observed the accused during his testimony and noted his great nervousness, his fleeting glare and his numerous hesitations in cross-examination, the undersigned is convinced that [the accused] has simply forged his version of the facts according to the elements of disclosure, and that he thereby lied to the Court in a shameless manner. (R. v. Martin, 2017, our translation)

However, although the previous example explicitly states the impact of gaze aversion, judges do not have a legal obligation to describe all the elements that influenced their judgement: “the degree of detail required in explaining findings on credibility may also, as discussed above, vary with the evidentiary record and the dynamic of the trial” (R. v. R.E.M., 2008, p. 12.). Moreover, the impact of false beliefs and pseudoscience regarding nonverbal communication can be unconscious (Porter & ten Brinke, 2009), thus making it impossible for judges to detail them, and making it very difficult to fully know the extent of their detrimental influence in natural settings.

Additionally, if a judge relies on pseudoscientific claims to assess the credibility of witnesses, it is a matter of concern that miscarriages of justice could occur considering credibility is “an issue that pervades most trials, and at its broadest may amount to a

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decision on guilt or innocence” (R. v. Handy, 2002, p. 951). Faced with such a situation, the psychology and law research community should not allow pseudoscientific claims about nonverbal communication and deception detection to go unchallenged.

Synergology, for example, deflect from empiricism and essentially, the peer-reviewed publication process, and was promoted through general public books, blog posts and medias appearances. Yet, numerous Quebec police officers, lawyers and decision makers from different courts and administrative tribunals attended conferences and seminars in synergology (Gagnon, n.d.a), and it remained publicly unchallenged for years, until a popular newspaper published an extensive piece on the subject, whereupon a formal notice to apologize and retract was sent from the founder of synergology (Denault, Larivée, Plouffe, & Plusquellec, 2015). Whereas part of the blame for the promotion of pseudoscientific analytical approaches fall on the organizations who offered the conferences and seminars, research scientists too bear a share of responsibility:

Part of the blame must also fall on social scientists for our failure to reach those who could benefit most from our findings. Is it not just as much our responsibility to attempt to bridge the gap that exists between the halls of academia and the world of professional practice? (Colwell, 2006, p. 501).

Whilst the importance of bridging the gap between science and practice has been mentioned several times (e.g., Riggio & Feldman, 2005; Van Koppen, 2007; Porter & ten Brinke, 2010; Kassin, 2012; Chaplin & Shaw, 2016), the fact the attention of professionals within the justice system can be drawn toward pseudoscientific analytical approaches, more promising than what science allows and now more accessible than ever, requires research scientists to take concrete actions, notably to increase the judicial

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professionals' knowledge about science and to provide them with analytical tools to distinguish science from pseudoscience (Besley & Nisbet, 2011; Dudo & Besley, 2016; Lilienfeld & Landfield, 2008).

Moreover, research scientists should engage with professional corporations who offer conferences and seminars in order to promote evidence based practices or, if a professional corporation lacks the will to promote science to its members, to actively monitor their program to report the use of pseudoscientific analytical approaches to the appropriate authorities if the efficiency of the judicial system is at stake. Otherwise, since they lack sufficient scientific education to distinguish science from pseudoscience (Haney, 1980; Redding, Floyd, & Hawk, 2001; Fraigman, 2006; Moreno, 2003; Tadei, Finnilä, Reite, Antfolk & Santtila, 2016), professionals within the justice system are likely to continue to use knowledge on human behavior acquired notably through experiences and unscientific sources that may, at first, be deemed innocuous. However, regarding credibility assessment, such experiences and unscientific sources could explain why the “attention paid to nonverbal behaviour by many decision makers has little or no clear connection with scientifically validated and recognized knowledge” (Denault, 2015, p. 126, our translation). Moreover, the effect of such experiences and unscientific sources exceeds the credibility assessment of witnesses and, subsequently, the outcome of trials.

In *Smith v. Doe* (2003), for example, the United States Supreme Court upheld the constitutionality of a sex offender registration law because of the “frightening and high” rates of recidivism of sex offenders:

The legislature's findings are consistent with grave concerns over the high rate of recidivism among convicted sex offenders and their dangerousness as a class. The

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risk of recidivism posed by sex offenders is “frightening and high.” *Smith v. Doe* (2003)

In order to justify the ‘frightening and high’ risk of recidivism, an earlier decision of the United States Supreme Court was cited, *McKune v. Lile* (2002), where the rate of recidivisms of sex offenders was qualified as ‘frightening and high’ based on a 1988 document from the National Institute of Corrections of the United States Department of Justice. In this document it was asserted that untreated offenders have a recidivism rate of around 80%. However, that assertion reiterated an unwarranted claim from a 1986 article in *Psychology Today*, a magazine aimed at a lay audience, written by a counselor who ran a counseling program for jailed sex offenders (Ellman & Ellman, 2015; Hamilton, 2017). In other words, if the recidivism rate of around 80% from the 1986 article in *Psychology Today* had been vigorously debunked by research scientists in 1986, it is highly unlikely that the National Institute of Corrections of the United States Department of Justice and, subsequently, the United States Supreme Court, as well as the lower courts that cited *McKune v. Lile* (2002) and *Smith v. Doe* (2003), would have used such an unwarranted claim.

Thus, whether or not it is about the credibility assessment of witnesses, the impact of pseudoscientific claims should not be underestimated and, as Heydon (2008), Nahari, Vrij and Fisher (2012) and Bogaard, Meijer, Vrij and Merckelbach (2016) did for Scientific Content Analysis (SCAN), research scientists who promote evidence based practices should vigorously challenge them:

...the scientific process doesn’t stop when results are published in a peer reviewed journal. Wider communication is also involved, and that includes ensuring not

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only that information (including uncertainties) is understood, but also that misinformation and errors are corrected where necessary. (Williamson, 2016, p. 171).

In addition to a fear to venture beyond the comfort of their research environment, to risk jeopardising their research funding and scientific credibility as well as their ‘intellectual mission’ and productivity (Holt, 2017; Nelson & Vucetich, 2009; Heleta, 2016), research scientists who challenge pseudoscience risk all sort of *ad hominem* attacks such as defamatory insults, hate mails, and even threats and lawsuits (Loftus, 2016; Mann, 2016; Denault, 2017).

However, having thorough knowledge on a variety of subjects, research scientists are in a better position to take preventive measures and vigorously challenge pseudoscientific claims that pose a risk to the judicial system, a cornerstone of democracy. Moreover, failing to speak out, thus leaving pseudoscience to take its toll on the justice system, and subsequently asking to implement evidence based practices that the lack of preventive measures rendered fully or in part necessary, will likely hinder the creation of an environment that fosters communication and trust, which are important considerations for successful research-practice partnerships (Beutler, Williams, Wakefield, & Entwistle, 1995; Vangen & Huxham, 2003, Garland, Plemmons, & Koontz, 2006). Refuting falsehood and inaccuracies takes more time than to produce them (this case study is a clear example), but the amount of time needed to prevent the spread of inaccurate science is presumptively lower in contrast to what will be required to mitigate, stop or rectify the consequences of failing to speak out. With regards to possible miscarriages of justice, an ounce of prevention is certainly worth a pound of cure.

Conclusion

The present case study intended to highlight the pitfalls associated with the use of a pseudoscientific analytical approach when assessing the credibility of witnesses. It must be stressed that the present case study is not in any way a reflection on the possible guilt or innocence of Todd Christopher Kohlhepp. However, it aims to draw attention to publically accessible information, presented under a scientific illusion, which claims to provide evidence of strategic and manipulative behaviours that can impair the credibility assessment of a defendant. These behavioural explanations are not empirically driven by science, and pose a risk to the judicial system when they are presented as such. That is, the primary assumptions of Salvador and Gagnon (2016) have no theoretical underpinnings or empirical evidence, and amounts to an amalgamation of cherry picked inferences. These inferences are drawn in support of what appears to be little more than situational and conformational hypotheses regarding behaviour and cognition.

Since such ‘conclusions’ can find their way into training and, ultimately, into the hands of professionals within the justice system, it is key that research scientists who advocate for evidence based practices identify publicised accounts of pseudoscience and bring them to the attention of judicial professionals, as well as the general public whose confidence in the justice system could be undermined, to reduce the likelihood of miscarriages of justice. It is hoped that the present case study, by showing the nature of a pseudoscientific analytical approach and the possible consequences on the credibility assessment of witnesses and, subsequently, on the outcome of trials, will encourage research scientists to take a stand against unfounded speculations which mock the intellectual scrutiny associated with scientific research.

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