



ELSEVIER

Contents lists available at ScienceDirect

Science &amp; Justice

journal homepage: [www.elsevier.com/locate/scijus](http://www.elsevier.com/locate/scijus)

## Letter to the Editor

**Aiding the interpretation of forensic gait analysis: Development of a features of gait database**

In response to the letter dated 28th May 2017, the authors of the paper entitled ‘Aiding the Interpretation of Forensic Gait Analysis: Development of a Features of Gait Database’ which was published in volume 56, issue 6 in December 2016, would like to clarify a number of points and address the issues raised by the letter's signatories. The substantive content of the letter has been addressed section by section.

## Comment

There are considerable drawbacks of using such a database as referred to in the article and designed in the way that the paper describes for use in the justice systems and that these are not made clear.

## Response

The authors have been careful to emphasise that the database should be used to “assist” the gait analyst, and should be used ‘cautiously and transparently’. The authors have been both clear and transparent as to how the data collected to date was produced, thus providing the background information to inform appropriate use of the database. The design of the database was underpinned by the Forensic Science Providers Codes of Practice and Conduct [1], which provides specific guidance upon the design and implementation of databases that are to be used within forensic science as described by the Forensic Science Regulator. This ensured that the design was robust and met the requirements for the criminal justice system. As concluded by the authors, this represents a first attempt to initiate the development of a useable and openly accessible database, and they welcome constructive suggestions as to how future data could be collected, and contact from all those wishing to collaborate.

## Comment

The basis upon which the authors determine clinicians are unable to analyse normal gait is not made clear. It would be useful to know how the authors formed the thesis that clinicians are somehow lacking in analysis of the movement in normal adult humans given their training and which we reject as such a statement clearly lacks knowledge and credibility.

## Response

At no point in the paper do the authors state or even suggest that clinicians are unable to analyse normal gait. The authors believe that a range of professions, including podiatry, are very well trained and often experienced in analysing normal, and indeed abnormal, gait.

## Comment

The paper states: “To date, data collection has taken place at seven locations around the UK, yielding 1007 data sets, each containing 28 pieces of information about the subject.”

The approach described in the article on the data collection is where one person observes and then assesses 21 data points for each person as listed on the data collection sheet and records those which includes: sex, age, height, weight, ethnicity, plus 16 features of gait. However, in the results section the paper it states there are 28 data points. There does not appear to be mention of the other 7 data points that are absent from the data collection sheet as per Table 1 in the paper. The study design does not allow repeatability or reproducibility, a fundamental tenet of scientific research.

## Response

The data collection form has 21 headings, 7 of which are collected for both right and left, giving a total of 28 pieces of information. The publication of the methodology used to collect the data allows both the repeatability and the reproducibility of the database to be tested should workers wish to do so. With regard to the validity of the observations made of each of the subjects, the use of an observer with more than 35 years of experience of gait analysis, and significant experience of producing verified forensic gait analysis evidence reports was considered by the authors to be a suitable starting point for the data collection.

## Comment

At the same time the observer apparently (still just the one observer) is also able to exclude those carrying bags etc. which might alter their gait and to count the people moving in the direction they wish to observe for their database.

## Response

The authors are unclear as to the observation being made in this sentence. Pedestrians that were doing any of the things listed were simply not included, and did not impact on the ability to count pedestrians or observe those selected for inclusion.

## Comment

The article indicates that the details are then recorded onto the data collection sheet as displayed in Table 1 of the article. However, at no time is there any evidence collected of, for example, a video of each person included in the data collection being unobtrusively observed for future collaboration/verification. This is a considerable flaw of the study design.

## Response

The collection of a video, from which the subject could have been identified, without informed consent would have been a fundamental breach of research ethics.

## Comment

<http://dx.doi.org/10.1016/j.scijus.2017.08.006>

In forensic gait analysis, CCTV footage of unknown individual/s and video footage of known individual/s are analysed and the footage played at normal speed, slower speeds, single frame advances, pause and reverse modes for motion analysis. Having such video recordings allows others to analyse and compare the same material. This also allows for the material to be independently verified by a third party. The lack of verification at any point in this database collection is a major and fundamental flaw by design.

Response

As already described, the observer had considerable experience of gait analysis, and its application in the forensic context with independent verification of the features of gait observed for every case undertaken. Had the observer been consistently in error with regard to the features observed in the footage relating to these cases, these errors would have been highlighted by the verifier, and remedial action taken. The validity of observational gait analysis is thought to be reliant on the skill and experience of the observer, both of which were considered to be accounted for in the selection of the observer. As the database develops and more observers are recruited for data collection, evaluation of intra and inter-rater reliability will become a usual part of the data collection process.

Comment

In addition to observations on the data collection sheet of non-numerical estimations on height and weight, there are 3 age group estimates namely 18–30; 31–50 and > 51. This highlights another question regarding reliability where no independent third party verification of data is enabled at any point in the collection process. This lack of reliability and verification may then skew the reliance of any other data or information to which that data is applied or combined. To collect such data in that way and to then suggest that it be used in a justice system with a view to providing a database in the identification of individuals is very disturbing indeed.

Response

The estimation of age band was included to provide a broad indication of the age of the subject, not as an attempt to establish the absolute age of the subject. Forensic gait analysis is predicated on the identification of features of gait, many of which include an estimate of magnitude. As few reliable measurements can be taken from CCTV footage of the quality usually submitted for use in forensic gait analysis, the signatories appear to be suggesting that no estimates of magnitude should be used. Whether or not an estimation of age is utilised by a user of the database is entirely at the discretion of the user, and is not determined by its inclusion in the database. Such data points are used with the caution that they are an estimate only, and the nature of their collection is clearly noted. The inclusion of an estimated age also allows the database to inform the need for future research regarding the prevalence of features of gait related to age.

Comment

In consideration of the gait features referred to on the data collection sheet as per Table 1 in the article:

Response

The following three comments appear to relate to the interpretation of terminology used in the data collection form. As a general response to these observations the authors would point out that it clearly states in section five of the paper that collection of additional data by other observers will take place after a training event, which will militate against any misinterpretation of the terminology used. Misinterpretation of terminology by potential users could be militated against by a similar event and the inclusion of a glossary of terms.

Comment

'Pelvic Rotation', as mentioned on the data collection sheet Table 1 of the article, is stated as being measured as, 'Limited' 'Moderate' or 'Exaggerated'. One cannot reliably assess 'Pelvic Rotation' under the conditions described where the data was collected in a public place with various levels of obscuring occurring from clothing. Also, it is not meaningful to measure 'Pelvic Rotation' for identification uses in this way or with descriptors as 'Limited', 'Moderate' and 'Exaggerated' without defining what those are. Such data collection has no real meaning.

Response

At no point in the paper is it stated that pelvic rotation is measured. Rotations of the pelvis are a fundamental part of human locomotion and occur in all three planes. The rotation included in the data collection form was of course transverse plane, and therefore should perhaps have been more correctly referred to as pelvic yaw. This movement, like many movements, varies during walking from person to person, and therefore its inclusion in the data collection sheet was legitimate and was informed by the outcome of the Delphi. As already mentioned, estimates of magnitude are a fundamental part of forensic gait analysis, and whether or not an estimation of pelvic yaw is utilised by a user of the database is entirely at the discretion of the user, and is not determined by its inclusion in the database.

Comment

*Forefoot lift: 'High/Low'*. We wonder what does that mean? Podiatrists may interpret that differently to the data collector. Such a descriptor of this of 'High/Low' is neither useful nor meaningful for the purposes of identification of individuals without defining what 'High/Low' is.

Response

Forefoot lift in this instance refers to the height of the forefoot from the ground during the latter part of the swing phase of gait, and again varies from person to person. As noted in the paper the release of the database to practitioners will be dependent upon their receipt of appropriate training in its use, a facet of which will be the definition of the terms used. The signatories appear to be suggesting that descriptors such as high or low should be defined in terms of a measurement. This would be a move from estimation to measurement, and present the challenge of taking measurements from footage.

Comment

*'Forefoot slap'*: There is no guide indicator in that box. Does it infer YES/NO; Present/Absent: Extra Large, Large, Medium, Small or something else?

Response

A single box was only required in this instance as a fore foot slap was considered to be either present or not present. A tick in the box would indicate it was present; no tick that it was not present. The authors would like to thank the signatories for the introduction of the concept of a scale of forefoot slap magnitude, and welcome suggestions as to how the points of such a scale would be defined and included to develop the database further.

Comment

*'The use of a single observer for data collection ensured consistency in the data'*.

It is stated that a Delphi study was performed at the outset between four observers to agree the features of gait and criteria being recorded. However, there are vastly more than four people undertaking gait analysis in the UK, so why only four used in the Delphi?

Response

Download English Version:

<https://daneshyari.com/en/article/6555942>

Download Persian Version:

<https://daneshyari.com/article/6555942>

[Daneshyari.com](https://daneshyari.com)