

# Do "Shufflebottoms" bottom shuffle?

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**Aims:** To investigate anecdotal evidence that the name "Shufflebottom" originates from the dominantly inherited characteristic of bottom shuffling.

**Methods:** A questionnaire based retrospective study to determine the incidence of bottom shuffling and age of first walking among those named "Shufflebottom" and a control population, of those named "Walker".

**Results:** There was no statistically significant difference in incidence of bottom shuffling or age at first walking, between the two groups. The incidence of bottom shuffling (21.4%) was generally higher than has been described previously and Walkers were more likely to walk later than Shufflebottoms.

**Conclusion:** Shufflebottoms are no more likely to bottom shuffle than other children. The origin of the surname as representing this physical characteristic cannot be confirmed.

Different surnames vary widely in their derivation<sup>1</sup> and may be subject to considerable genealogical interpretation. They may derive from the Middle Ages when a Christian name was suffixed by "son of ..." to aid identification. Obvious examples of such patronymic names would include Johnson, or one of our authors—Davies. Other names pertain to the place of the person's origin such as Hill or Brook. Some names described the ancestor's profession. Taylor or Baker are examples, as well as another of the authors, Dr Palmer, whose forefathers were said to have carried palm leaves back from the crusades. A further source was nicknames based on a characteristic of the person who took that name. Kennedy is Gaelic for "ugly head" and somebody given the name Wolf may have been considered wily. In Dr Fox's case, had his Polish grandfather not taken the decision to change his name from Brochovsky on his arrival in Britain, we may have guessed that his ancestors were known for their cunning.

The name Shufflebottom is relatively uncommon and is found predominantly in Lancashire. Its origins are difficult to trace but some genealogists have considered it to have been derived from "Shipper"—a place where sheep were washed and "bottom", meaning the bottom of a valley.<sup>2</sup> However, there is also well established anecdotal evidence<sup>3</sup> that the name may in fact be derived not from a place of origin but from an exhibited characteristic—bottom shuffling. This latter possibility is well known to a number of "Shufflebottoms" and is also suggested in *Forfar and Arneil's Textbook of paediatrics*. At present, there is no evidence base to confirm this.

The mean age for a child to start walking, defined as six unaided steps, is between 12 and 13 months of age.<sup>4-5</sup> A variety of factors may affect when a baby begins to walk. These factors include birth weight, use of baby walkers, and even the time of year that the baby is born.<sup>5</sup> A further important determinant is which of the possible alternative mobilisation strategies is utilised<sup>6</sup> beforehand. This usually involves crawling, which, as lower body strength and balance develop, progresses to standing, cruising, and then walking. However, a proportion of babies develop slightly different strategies to the classic crawl. These methods include a commando style belly crawl or bottom shuffling. Approximately 5–20% of infants use bottom shuffling<sup>7</sup> (also known as hitching or scooting in North America<sup>8</sup>) to get around, although 9% seems to be the most evidence based figure.<sup>6,9</sup> The incidence

of bottom shuffling increases to 30% when considering the subpopulation of children with delayed walking.<sup>8</sup> Bottom shufflers stay in the sitting position and move by wriggling forward on their buttocks. It typically develops about two to three months after unsupported sitting has been achieved. This method is often so successful that it delays the development of walking by a few months,<sup>6,8,9</sup> as the muscles required for weight bearing are not developed and the incentive to mobilise by other means is lessened. Shuffling has also been considered to be the manifestation of an underlying hypotonia,<sup>8</sup> which is benign in the long term but which explains the use of a non-crawling strategy. There is good evidence that bottom shuffling shows a familial preponderance. The exact mode of inheritance is unclear, but is most likely autosomal dominant<sup>8</sup> with incomplete penetrance. Given this mode of heritability, the descendants of those originally named for exhibiting the characteristic, should still show a preponderance to it, compared to the wider population.

Our aim in this study was to compare incidence of bottom shuffling among two different populations, one of which may have a predisposition to the condition. Age of walking was also compared to detect any difference in success of strategies for early mobilisation.

## METHODS

We devised a questionnaire suitable for the two populations under investigation. For both study population, surname Shufflebottom, and a control population, the method of mobilisation before proceeding to walk was requested. In addition, information regarding the age at which they first walked was requested. The same information was requested with regard to the children of those questioned. Walking was defined as the age in months at which six unaided steps were first taken. The potential confounder of disease affecting mobilisation was also explored.

A control population representative of the general population was required, and thus people with the surname Walker were used.

The acquisition of the surname by marriage was eliminated and duplication of respondent's details avoided by requesting dates of birth, as there is potential for the respondent to complete their details and be related to a reply from a parent completing a form about their children. The questionnaire otherwise remained anonymous.

Prior to the study a power calculation was undertaken, and in order to detect a difference of two months between two mean ages of starting to walk, significant at 5% with power of 95%, it was necessary to enrol 41 people into each surname. Consequently 56 people from each surname were identified through the public domain, using Hotmail White Pages, an Internet based directory. Questionnaires were forwarded and followed up with telephone contact three weeks later, and after one month the study was closed.

## RESULTS

We obtained a dataset of 43 Shufflebottoms and 41 Walkers. None of the subjects in either group shared the same date of birth. No respondent suffered from a condition that had affected his or her mobility.

There was no difference in the likelihood to bottom shuffle prior to walking. Of the Walkers, 9/41 demonstrated this method, and of the Shufflebottoms 9/43 ( $\chi^2 = 0.0130$ ,  $p = 0.9092$ ). The overall incidence of bottom shuffling was 21.4%.

The average age of walking was also not significantly different between the two groups. The Walkers had a mean age of six unaided steps of 12.9 months (median 13, SD 2.28) and the Shufflebottoms a mean of 12.5 months (median 12, SD 2.05). A two tailed *t* test gave a *p* value of 0.385 (NS) between these two groups.

However, an interesting trend was observed. We categorised the age of walking into: early (11 months and under), normal (12–14 months), and late (15 months and later). The Shufflebottoms were more likely (Fisher's exact test,  $n = 84$ ,  $p = 0.0967$ ) to be in the early walking group when compared to the Walkers, with an odds ratio of 1.52. Although significance is only achieved at the  $p \leq 0.1$  level, with our small sample size, a type 2 error is possible.

## DISCUSSION

The results show that there is no significant difference in the incidence of bottom shuffling or age of first six unaided steps, between the Shufflebottoms and the Walkers. However, the occurrence of bottom shuffling was markedly higher than would have been expected from previous studies. No true increase in the prevalence of bottom shuffling has been documented in the recent medical literature although anecdotal evidence of this exists among those working in child development. The authors hypothesise that a real increase in the incidence of this phenomenon may indeed have occurred over the past decade and that it is a result of the success of the "Back to Sleep" campaign to protect babies from sudden infant death syndrome. As babies nowadays are far less likely to sleep prone, they have less opportunity to develop the skills of head control, active extension, weight shift, and trunk rotation which promote a natural progression to crawling—the so called ontogeny recapitulating phylogeny concept. Normally the infant progresses through amphibian, reptilian, and quadrupedal mammalian locomotion strategies before reaching the bipedal humanoid stage. Further work would be required to support this suggestion.

The limited number of Shufflebottoms makes a larger sample impractical, and thus a smaller difference between the groups would be difficult to detect. Inclusion of names derived from Shufflebottom, such as Shufflebotham could have been included to increase the sample size, but would risk the introduction of confounding factors.

When investigating information based on a paternally inherited parameter, such as surname, the issue of paternity is crucial. Unfortunately, data on adoption or paternity blood testing were not included in our research. The questionnaire also did not take the possibility of uncorrected premature birth into account regarding age of walking.

Recall bias is clearly evident among the sample, especially among those without living parents to remind them of their own previous walking patterns. Indeed, some respondents claimed walking by 6 months, which is extremely unlikely to be accurate, although no selection of data was performed in this study and all recollections are included. Although there is good evidence that childhood parameters such as birth weight are recalled with significant accuracy,<sup>10</sup> remembering precisely when your child first walked is difficult. Individuals' own definitions of walking would have varied from our own definition of six unaided steps. When a temporal association with walking was initially made, this figure is likely to stick in the memory. Information may also be skewed if late walking is more likely to be recalled accurately, given the concern it may have generated. Additionally, there will also be difficulties in recalling distant events regarding a locomotor feature which was considered insignificant at the time.

These results do not necessarily rule out the possibility that the name Shufflebottom did originate from the tendency to bottom shuffle. Only the original Shufflebottoms need have acquired the name, whereas if the characteristic is not inherited, the descendants would have the same prevalence of bottom shuffling as a control population. In this scenario, the Walkers, having a similar proportion of bottom shufflers, would suggest that the trait is indeed not genetically inherited, or that too many generations have passed to allow this surname to currently demonstrate the characteristic for which the name was first given.

Conversely, the use of Walkers as controls may itself be a confounder. After months of delayed mobility as a result of bottom shuffling, the initial Walkers may thus have obtained their nickname, in the same sarcasm that large men were given the name Small or Little. Equally, based on this study, the name Walker does not appear to infer that they enjoyed earlier mobility as a characteristic, but a similar argument regarding genetic dilution through generations remains.

The above arguments are, however, weakened by the likelihood that when surnames were initially created, it occurred when men travelled out from their home village into the cities. Only then were two names required for identification. These migrants would have been adults and their nicknames based on adult traits.

## CONCLUSION

The origin of the name Shufflebottom remains unclear. There is no evidence to suggest that present day Shufflebottoms are any more likely to bottom shuffle than the rest of the population. However, this does not negate the hypothesis regarding the origin of the surname.

Interestingly, the incidence of bottom shuffling in the groups studied is higher than previously reported, except in a delayed walking subgroup.

In consideration of further research into geneogenetics, the authors are also keen to compare maximal adult mobilisation speeds in a normal population to those with the name "Clapper".

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