

Re-examining the 'step-and-slide': sex differences in pedestrian collision avoidance...

[Health & Medicine](#), [Sex](#)



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Abstract

Previous literature has reported sex differences in collision avoidance behaviour by pedestrians. The current study sought to establish whether these sex differences are still valid now by observing an opportunity sample of male and female pedestrians in a busy location. A chi-square test found a significant ($p < 0.01$) relationship between sex and collision avoidance behaviour. In particular, women were significantly more likely to engage in closed passes and men were significantly more likely to engage in open passes. This finding is in keeping with the pattern previously reported by Collett and Marsh (1981). Future research is needed to understand why these sex differences may exist.

Introduction

Despite often busy and overcrowded public areas, pedestrians can be observed navigating and avoiding collisions with remarkable ease. Previous literature appears to be relatively unanimous in its observations and

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conclusions about how pedestrians are able to avoid collisions. In an early study, Goffman (1972) made a number of observations including that people tend to form two lanes whilst walking upon the pavement, with one group walking on the inside, away from the road and the other group walking on the outside and close to the road. Many years later, Collett and Marsh (1981) observed the same phenomenon and coined the term 'pedestrian streaming.' It was also discovered that individuals will use others' movements and monitor their intentions, known as "externalisation," to ensure a smoother passage. These movements may be unconscious or conscious and may as be discrete as a slight turn of the shoulders. Again, this phenomenon was also observed by Wolff (1973), who named it "behaviour monitoring."

Wolff (1973) observed that many pedestrians engage in what he coined the 'step-and-slide' pass, which involved a slight angling of the shoulders alongside a discrete side step. After videotaping the passing behaviour of individuals using a pedestrian crossing, Collett and Marsh (1981) noted significant sex differences in the strategies used whilst engaging in this type of pass. Males were far more likely to use an open pass strategy by orienting toward the person they were trying to avoid whereas females were more likely to use a closed pass strategy by orienting themselves away from the person they were attempting to avoid. Interestingly, the types of pass used could not adequately be explained by the natural position of the leg during passing and even when it was more difficult, women were still more likely to use a closed pass. The researchers concluded that the use of a closed pass

strategy by women was an example of self-protective behaviour. In particular, the authors concluded that women were attempting to protect their breasts after observing that they often drew their arms across their bodies during the pass.

The result of Collett and Marsh's (1981) study may now be outdated.

Therefore, the current study aimed to investigate whether sex differences in collision avoidance behaviour still exist today and whether the pattern still reflects that seen by Collett and Marsh (1981). Based on previous literature it is hypothesised that females will make more closed passes than males and that males will use more open passes than females.

Method

Participants

2, 910 participants (1, 376 females, 1, 534 males) were observed using an opportunity sample. As this was an observation study it was not feasible to collect demographic data such as age.

Materials

Observations were recorded on a data collection grid. The data collection grid was used to record the sex of the pedestrian and whether a open pass, closed pass or neutral pass was observed.

Design

This was a between-subjects design with male participants being compared with female participants. The predictor variable was the sex of the

pedestrian and the criterion variable was the type of passing behaviour exhibited.

Procedure

Before collecting data for the study a pilot study was carried out to ensure that the observers could correctly identify whether a pedestrian was exhibiting an open pass, closed pass or neutral behaviour. Data was collected on an opportunity sample of ten pedestrians for the pilot study.

For the main study, data was collected by observing pedestrians at various train stations during peak times. Two researchers collected the data with one acting as observer and the other acting as recorder. Observations were based on an opportunity sample and a mix of male-male, female-female and female-male interactions were recorded.

Results

A total of 1, 376 females and 1, 534 males were observed. Of the 1, 376 females, 561 engaged in an open pass, whereas 815 engaged in a closed pass. Of the 1, 534 males observed, 1, 070 engaged in an open pass, whereas 464 engaged in a closed pass. A chi-square test was performed and a significant relationship was found between sex and type of collision avoidance behaviour $\chi^2(1, N = 2910) = 247.32, p < 0.01$.

[Insert graph here]

Discussion

The aim of the current study was to investigate whether current sex differences in pedestrian collision avoidance behaviour support previous literature that has found females are more likely to use closed passes, whereas males are more likely to use open passes when avoiding each other in busy pedestrian areas. It was found that more women engaged in closed passes than men and that more men engaged in open passes than women. Statistical analysis revealed that there was a significant relationship between sex and type of collision avoidance behaviour. This means that women are significantly more likely to engage in closed passes, whereas men are significantly more likely to engage in open passes. This finding is in support of previous literature (Collett and Marsh, 1981) and the data supports the researchers' hypothesis.

Collett and Marsh (1981) argued that females engage in closed passes in an attempt to protect their breasts because they observed that women often drew their arms across their chests during the pass. However, more recent research has demonstrated that even in non-confrontational, everyday situations, females tend to sit in closed positions whilst keeping their arms close to their bodies (Cashdan, 1998; Vrugt and Luyerink, 2000). This suggests that Collett and Marsh's (1981) initial interpretation may be flawed. Women may naturally adopt closed body language, which they are also likely to use during pedestrian collision avoidance scenarios. The finding that men are more likely to use open passes is in keeping with previous literature on male body language and non-verbal communication. For example, Mehrabian (1968) found that men tend to show more alertness than women by directing

their shoulder orientation toward the other person. This could explain why men adopt an open position and direct their shoulders toward the other individual whilst passing them. Luxen (2005) found that men tend to exhibit behavioural dominance in situations involving women. Turning their body toward a woman, whilst she turns away, may reflect this dominance. Therefore, the current findings can be interpreted in the context of sex differences in both body language and non-verbal communication.

It is difficult to draw any strong conclusions from an observational study and only inferences can be made. However, based on the results and what is known about body language, it appears as though the sex differences in the way that individuals avoid pedestrian collisions still exist today as they did in the 1980s. The results also seem to support Collett and Marsh's (1981) conclusion that women are more likely to adopt a protective stance when making passes in a collision avoidance situation.

The current study had a notable number of strengths. Primarily, this study utilised a large sample, which is highly likely to be representative of the population as a whole. Generalisability was also strengthened by using different train station locations for observations. Furthermore, having taken place in a natural environment rather than a lab setting, the results have good ecological validity. However, the observation method has a number of limitations, which should be noted. Firstly, although a pilot study was carried out in order to familiarise the observer with different types of passes, the data would have been more reliable if two observers had been used at any one time. An alternative method of improving the study would have to been

to video record the observation area so that a second observer could interpret an identical scenario of pedestrian collision avoidance. This would have provided a measure of inter-observer reliability, which would have strengthened the results of the study. It is also possible that the observer was biased because they were aware of the study hypothesis. In other words, the observer may have interpreted females to have carried out more closed passes because this is what was expected based on the previous literature. In future studies, keeping the observer blind to the hypothesis of the study will reduce this risk. There are also some ethical concerns with large scale observation studies such as this. For example, some individuals may object to being watched and to their behaviour being recorded. However, with such a large scale study, it would have been impossible to have sought the informed consent of each participant. Data was also completely anonymised, which keeps the study within ethical boundaries. Although the study has good generalisability, this is somewhat weakened by collecting results from only the UK. Future research may wish to focus on whether the same patterns are found internationally. Based on the findings of the current study, future studies may also wish to focus on exploring in more detail why these sex differences exist. For example, a sample of individuals exhibiting these behaviours could be administered a questionnaire to explore whether the behaviour is unconscious or conscious and if it is conscious, why they engage in either open or closed passes.

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