Relative Influences of Individual, Social Environmental, and Physical Environmental Correlates of Walking

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Objectives. This study sought to examine individual, social environmental, and physical environmental correlates of walking.

Methods. A cross-sectional survey was conducted among healthy workers and homemakers residing in metropolitan Perth, Western Australia.

Results. Most respondents walked for transport or recreation, but only 17.2% did a sufficient amount of walking to accrue health benefits. After adjustment, the relative influences of individual, social environmental, and physical environmental factors were found to be almost equally important.

Conclusions. Although walking is popular, few people do enough walking to benefit their health. Those who walk as well as engage in other physical activities appear more likely to achieve recommended levels of activity. Promoting walking may require a comprehensive strategy. (*Am J Public Health.* 2003;93:1583–1589)

Walking was placed firmly on the public health agenda in 1996 after publication of the US surgeon general's report on physical activity.[1,2] After reviewing decades of epidemiological evidence, the surgeon general concluded that physical inactivity was as important a disease risk factor as smoking and unhealthy diets. Moreover, evidence showed that individuals could derive health benefits by engaging in as little as 30 minutes of moderate exercise each day, including brisk walking.

Studies consistently show that walking is a popular activity among both men and women, but particularly among women and individuals older than 50 years.[3,4] However, fewer published studies have examined the factors that influence walking than have assessed factors associated with engaging in vigorous exercise.

Recently, there has been considerable interest in the environmental influences of physical activity.[5–7] In the present study, we examined the relative influences of individual, social environmental, and objectively measured physical environmental factors on a single form of physical activity: walking (see Giles-Corti and Donovan[8] for details regarding the social–ecological model adopted).

METHODS

Full details of the study methods can be found elsewhere.[8] Briefly, the study, conducted between August 1995 and March 1996, involved healthy homemakers and workers aged 18 to 59 years who resided in a 408-km^2 area of metropolitan Perth, Western Australia. Perth has a population of about 1.2 million, and its residents enjoy a relatively high standard of living in comparison with residents of other Australian cities.

As a means of controlling for potentially confounding variables, individuals with reasons not to engage in recreational physical activity (e.g., owing to illness or being physically active at work) were excluded. One eligible respondent was randomly selected from each household surveyed (the person whose birthday fell closest to the day of the interview). After 3 callbacks, a household response rate of 52.9% was achieved.

The Australian Bureau of Statistics drew a probability cluster sample from the study population. The final sample included 1803 respondents from 277 districts (939 from the 80th percentile and above in terms of socioeconomic advantage and 874 from the 20th percentile or below).[9] Two qualitative studies that assisted in the development of a social ecological model of physical activity preceded the main study.[10,11]

Variables

Full details regarding the variables used are available elsewhere.[8] Table 1 lists the subset of individual, social environmental, and physical environmental variables used in this study to examine factors associated with walking.

Physical environmental variables were measured objectively. Interviewers assessed the street on which the interview household was located to determine access to footpaths, shops, trees, and minor roads. A spatial access model[12] was used in measuring access to public open spaces, rivers, and beaches. This model assessed spatial distributions of facilities adjusted for the *distance of decay* factor, a measure of people's desire and ability to overcome distance or travel time to access facilities.[12] While use of a facility is inversely related to one's distance from the facility, the extent of the distance of decay factor depends on the attractiveness of the destination (i.e., its attributes), its location, and the user's access to transportation.[12]

The accessibility model that examined use of the rivers, beaches, and golf courses has been described elsewhere.[8] The model that assessed access to public open spaces adjusted for attractiveness, size, and distance via the following equation:

$$1) \qquad A_i = \sum_j m_j^{\alpha} s_j^{\lambda} / d_{ij}^{\beta},$$

where A_i is the access index at origin i; m_j is the attractiveness of destination j; s_j is the size of destination j; d_{ij} is the distance between origin i and destination j; α is an estimated destination-specific attractiveness-decay parameter between i and j; λ is an estimated destination-specific size-decay parameter between i and j; and β is an estimated destination-specific distance-decay parameter between i and j.

Attractiveness scores were based on weighted average scores indicating the presence or absence of certain attributes in the study area's 516 public open spaces more than 2 acres in size.[17] Modified weights were derived from a survey of urban planners in each of the local councils represented in the study area, who were asked to allocate 100

TABLE 1—Independent Variables Used in the Model

	Mode of Measurement	Scale
Individual cognitive variables		
Attitude toward process of trying to exercise[13]	How "unpleasant/pleasant," "difficult/easy," or "bad/good" the process of trying to do a regular exercise routine[a] would be "regardless of whether you succeed or fail"[b]	7 point: –3 to 3
Frequency of past attempts[13]	During the past 3 months, how many times, if any, did you try to do a regular physical activity routine?[a]	5 point: 1 = never, 5 = weekly
Perceived behavioral control[14]	Assuming that you tried to do a regular exercise routine[a] over the next 2 weeks, how likely or unlikely is it that you would actually stick to your routine?	7 point: 1 = very unlikely, 7 = very likely
Behavioral skills used in the past month[15]	How frequently in the last month did you: set a goal for how much physical activity you would like to do; plan particular days on which you would do physical activity; and arrange to meet someone to do physical activity with?[a]	5 point: 1 = never, 5 = weekly
Intention to try in the next 2 weeks[14]	Before this interview, how likely or unlikely is it that in the next 2 weeks you would try to do a regular exercise routine?[a]	7 point: 1 = very unlikely, 7 = very likely
Social environmental variables		
Dog ownership	Do you have a dog in this household?	1 = yes, 0 = no
Club membership	Are you a member of a sport, exercise, or outdoor recreational group or club?	1 = yes, 0 = no
Frequency of participation in physical activity by 5 significant others[16]	How often over the last month did the following people[c] do physical activity, including walking?	5 point: 1 = never, 5 = more than once a week[d,e]
Frequency of a significant other doing physical activity with respondent[16]	Over the past 3 months, which of these people,[c] if any, did a physical activity with you, including walking?	4 point: 0 = never, 4 = weekly[d,f]
Physical environmental variables		
Functional environment	Interviewer noted whether a sidewalk (on both sides or one side of street) or shop was visible on the street	4 categories: no sidewalk or shop; no sidewalk but shop; sidewalk but no shop; both sidewalk and shop
Appeal of environment	Interviewer noted the type of street (cul de sac, minor local road, major local road, highway or major thoroughfare) and whether the street was tree lined; had good (more than one tree to a block), medium (one tree per block), poor (less than one tree per block), or mixed tree coverage; or had no trees	4 categories: major traffic and no trees; major traffic and some trees; minor traffic and no trees; minor traffic and some trees
Overall spatial access to attractive public open space, river, beach, golf courses[g]	Total spatial access to each of these facilities measured on a continuous scale and recoded into 4 categories	4 categories: 1 = bottom quartile of access, 4 = top quartile of access

[a]Respondents were given a choice of preferred exercise, either three 20-minute sessions of vigorous exercise each week or 30 minutes to 1 hour of light to moderate exercise each day.
[b]Recoded as the mean of the sum of these 3 items.
[c]Spouse or partner, close family members, people at work, close friends and people in neighborhood (based on items developed by Sallis and colleagues[32]).
[d]After an initial examination of the results, these variables were recoded to 1 (more than once a week) and 0 (all other responses). A single item, "number of significant others who did physical activity," was developed.
[e]More than once per week in the past month.
[f]Weekly with the respondent in the past 3 months.
[g]For full details of how the spatial access variables were developed, see Giles-Corti and Donovan.[8]

points to 10 attributes that might contribute to open spaces being used for physical activity.[17] In the current study, which focused on adults, only 9 attributes were included in the overall score (presence of children's play equipment was excluded, and the weights of the remaining attributes were reallocated to sum to 100).

The overall weighted score was based on the presence or absence of (1) shady trees on paths (canopies of many trees touch [weighted value of 14.3], canopies of some trees touch [11.4], canopies do not touch but trees close together [8.6], canopies of trees do not touch and trees are spread apart [5.7], tree coverage sparse [2.86], no trees along paths [0]), (2) irrigated lawns (15.3), (3) walking paths (13.9), (4) sports facilities (13.9), (5) near beach or river (13.1), (6) water-associated features (e.g., lake pond) (8.3), (7) quiet surrounding roads (i.e., a cul-de-sac or minor roads only [8.0]), (8) artifical lighting (6.8), and (9) bird life (3.8). The attractiveness score for each public open space was estimated via the following equation:

$$2) \qquad \mathrm{Att} = \sum_j \mathrm{A}_j \times \mathrm{w}_j,$$

where Att is the attractiveness score, A is a binary indicator (0 or 1) of the presence of the

*j*th attribute and w_j is the weight for the *j*th attribute.

Destination-specific decay parameters were estimated for attractiveness, size, and distance (see Giles-Corti and Donovan[8] for details of the method used). Briefly, these estimations involved the use of a linear regression model in which the log values for attractiveness, size, and distance were separately regressed on the log value for percentage of opportunities available to access the facilities used.

The exponential coefficients from the linear regressions used as the decay parameters in subsequent modeling were 1.91 for distance, 0.52 for attractiveness, and 0.85 for size. An exponential coefficient of less than 1 indicates that (all else being equal) as the attractiveness and size of a public open space double, use increases by less than one half. A decay of distance parameter of more than 1 indicates that when distance doubles, facility use reduces by more than one half. The sizes of these coefficients indicate that use of public open space is sensitive to distance and that the size of the space is more likely than its other attributes to attract users. However, the attractiveness, distance, and size model was retained because the attractiveness of existing parks, unlike their size, can be modified.

The physical activity items were based on a modified version of items previously used in Australian studies.[18] Separate measurements were made of respondents' frequency and total duration of walking for transport and walking for recreation in the previous 2 weeks. The dependent variable was "walking at recommended levels" (1=yes, 0=no), defined as 12 or more sessions of walking in the previous 2 weeks totaling 360 minutes or more.

Statistical Analysis

The present analysis was based on 1773 respondents who reported in-scope physical activity data (i.e., 30 participants were excluded because they appeared to overreport their activity levels). We undertook the analysis using SPSS.[19] After creating scales for the individual cognitive variables comprising multiple items, we assessed internal consistency. Results of these assessments showed that consistency values ranged from 0.71 to 0.86, indicating satisfactory internal consistency.

We tested the social ecological model using unconditional logistic regression analyses. Variables for inclusion in the final model were assessed in terms of whether they were statistically ($P<.05$), empirically (point estimates at least 20% greater or lower than the reference category), or theoretically important (regardless of the empirical results). However, in the interest of parsimony, we assessed theoretical importance by examining the width of the confidence intervals before making a final decision to include a variable in the final model. This approach allowed a new ecological model to be developed that combined individual, social environmental, and physical environmental variables. The independent variables included in the final model were adjusted for age, gender, number of children younger than 18 years living at home, household income, and education.

To examine the relative influence of individual, social environmental, and physical environmental determinants, we summarized 3 "classes" of determinants (i.e., individual, social environmental, and physical environmental; referred to as "determinant scores") and the demographic factors into multivariate summary scores.[20] Our development of multivariate summary scores was based on a method outlined by Miettinen.[20] He proposed using a single multivariate summary score made up of potential confounding variables that, when grouped into categories, could be used for cross-classification purposes. This scoring technique was developed to overcome inefficiency in analyses that require control of a large number of covariates. In this study, the individual, social environmental, and physical environmental determinant scores were grouped into tertiles representing low, medium, and high "risk," and demographic scores were grouped into deciles.

RESULTS

Types and Levels of Activity

Our results confirmed that walking is a popular form of physical activity: in the 2 weeks preceding the survey, 72.1% of respondents had walked for transport, and 68.5% had walked for recreation. However, only 17.2% did a sufficient amount of walking to be classified as walking at recommended levels (6 sessions totaling 180 minutes or more per week).

To estimate the overall level of physical activity in the study population, we asked respondents whether they participated in a number of types of physical activity: light to moderate activities (e.g., gardening, heavy household chores), vigorous activities (e.g., jogging, aerobics, or vigorous swimming), and walking (either for transport or for recreation). Table 2 shows that the majority (66.5%) of respondents reported engaging in a combination of physical activities. Only 7.4% of respondents reported exclusively walking for transport, and 13.1% reported exclusively walking for recreation. Of those who engaged in a combination of activities, 78.2% achieved recommended levels of physical activity, as compared with 13.6% of those who walked for transport only and 31.7% of those who walked for recreation only.

TABLE 2—Types of Activity Undertaken During Past 2 Weeks, by Physical Activity Level: Perth, Australia, 1995–1996

Type(s) of Physical Activity Undertaken	Physical Activity Level			
	No.	Insufficient, %	Sufficient, %[a]	As % of Total Sample
None	77	100.0	0.0	4.3
Recreational walking only	233	68.2	31.7	13.1
Walking for transport only	132	86.4	13.6	7.4
Vigorous activity only	82	29.3	70.3	4.6
Light to moderate activity only	70	70.0	30.0	3.9
Combination	1179	21.9	78.2	66.5

[a]Defined as the equivalent of 30 minutes of moderate activity on most days of the week.[1,2]

TABLE 3–Associations Between Walking at Recommended Levels and Individual, Social Environmental, and Physical Environmental Determinants: Logistic Regression Odds Ratios

Determinant	Final Model Odds Ratio (n = 1688)[a]	95% Confidence Interval	*P*
Attitude toward process			
Negative/neutral[b]	1.00		
Positive	1.23	0.79, 1.91	.361
Very positive	1.45	0.89, 2.35	.133
Frequency of attempts in past 3 months			
Never[b]	1.00		
1–2 times	1.16	0.58, 2.29	.680
Once a month	1.19	0.50, 2.82	.700
2–3 times a month	0.57	0.28, 1.19	.136
Weekly	1.43	0.92, 2.22	.118
Perceived behavioral control			
Low/uncertain[b]	1.00		
High	1.48	1.00, 2.19	.050
Frequency of behavioral skill use used in past month			
Never[b]	1.00		
Once	0.80	0.52, 1.24	.302
2–3 times	0.61	0.39, 0.97	.036
Weekly	0.68	0.42, 1.10	.110
More than once a week	0.53	0.30, 0.93	.026
Intention to be physically active in next 2 weeks			
Low[b]	1.00		
Medium	1.15	0.70, 1.76	.645
High	1.83	1.14, 2.94	.013
Sport, recreation, or outdoor club membership			
No[b]	1.00		
Yes	0.54	0.39, 0.75	.000
Dog ownership			
No[b]	1.00		
Yes	1.58	1.19, 2.09	.002
No. of significant others known to exercise weekly in past month			
0[b]	1.00		
1	1.15	0.76, 1.73	.511
2	1.24	0.80, 1.92	.342
3	1.07	0.66, 1.73	.779
4 or more	1.32	0.77, 2.25	.310
No. of significant others who exercised with respondent weekly over past 3 months			
0[b]	1.00		
1	1.81	1.30, 2.52	.000
2	2.05	1.36, 3.09	.001
3	1.48	0.75, 2.93	.256
4 or more	3.42	1.14, 10.2	.028
Functional environment			
No sidewalk, no shop[b]	1.00		
No sidewalk, shop	1.34	0.22-8.19	0.753
Sidewalk, no shop	1.23	0.88-1.72	0.223
Sidewalk, shop	1.45	0.82-2.58	0.202

Continued

Factors Associated With Recommended Levels of Walking

After adjustment, walking at recommended levels appeared to be associated with 12 of the 16 independent variables examined (access to a beach, a river, and a golf course were dropped from the final model), although chance could not be ruled out as an explanation for many of these findings (Table 3). With respect to individual variables, the odds of achieving recommended levels of walking were 48% higher among respondents with a high level of perceived behavioral control than among those with a low level of perceived behavioral control (self-control).[14] Also, odds were nearly twice as high for individuals who were highly intent on being physically active in the next 2 weeks as for those not as intent on being active.

Although results were not statistically significant, there was empirical evidence that odds of achieving recommended levels of walking were 45% higher among individuals with a very positive attitude toward the process of being physically active (odds ratio [OR] = 1.45, 95% confidence interval [CI] = 0.89, 2.35) than among those with a negative or neutral attitude. Also, odds also were 43% higher among those who had attempted to be active weekly during the past 3 months (OR = 1.43, 95% CI = 0.92, 2.22) than among those who had not made such an attempt.

In terms of the social environment, the odds of achieving recommended levels of walking increased with the number of significant others who had exercised weekly with the respondent during the previous 3 months (test for trend, $P < .001$). Those who exercised with one or more significant others were more likely to walk at the recommended level. Those who had 4 or more exercise partners were 3.42 times more likely to do so. In addition, the odds of walking at recommended levels were 58% higher among those who owned dogs than among those who did not. Knowing significant others who exercised appeared less influential than having others with whom to exercise.

The physical environment also appeared to influence walking at recommended levels. Relative to respondents in the bottom quartile of access to public open space, the odds of

TABLE 3–*Continued*

Appeal of environment			
Major traffic, no trees[b]	1.00		
Major traffic, some trees	1.41	0.89-2.24	0.137
Minor traffic, no trees	1.90	0.98-3.70	0.061
Minor traffic, some trees	1.62	0.98-2.67	0.060
Access to attractive public open space			
Bottom quartile of access[b]	1.00		
3rd quartile	0.76	0.51-1.14	0.185
2nd quartile	1.25	0.85-1.85	0.259
Top quartile	1.47	1.00-2.15	0.048

[a]Adjusted for age, gender, number of children younger than 18 years living at home, household income, and education.
[b]Reference category.

walking at recommended levels were 47% higher among those in the top quartile. In comparison with those who had major traffic and no trees on their street, the odds of achieving recommended levels of walking were nearly 50% higher among those who lived on a street with one or both of these features (combined OR=1.49; 95% CI=0.96, 2.33); however, chance could not be ruled out as an explanation for this result. Similarly, in comparison with those who had no sidewalk and no shop on their street, those who had access to either or both of these attributes were about 25% more likely to achieve recommended levels of walking (combined OR=1.25, CI=0.90, 1.74).

Finally, some of the factors examined were negatively associated with walking. For example, members of sporting, recreational, or outdoor clubs were only half as likely as nonmembers to achieve recommended levels of walking. Also, odds of achieving recommended levels were approximately one third lower among respondents who had used behavioral skills (e.g., setting a goal in regard to amount of physical activity, planning particular days on which to engage in an activity) during the past month, regardless of how frequently, than among those who had not used such skills; however, this result was not statistically significant.

Relative Effects of Factors Influencing Walking

As mentioned, summary scores were developed for the individual, social environmental, and physical environmental determinants examined here (Table 4). The results suggest that the relative influences of these 3 variables were similar. There was no evidence of multiplicative interactions. Relative to respondents in the lowest determinant score categories, the odds of achieving recommended levels of walking were 3.10 times higher among those in the high individual determinant score category, 2.79 times higher among those in the high social environmental determinant score category, and 2.13 times higher among those in the high physical environmental determinant score category.

DISCUSSION

Our results suggest that while walking is popular, few people do a sufficient amount of walking to gain health benefits. In short, more people need to do more walking, and more often, to achieve public health objectives. In addition, very few people who walked for transport only, or who walked for recreation only, achieved recommended levels of physical activity. Our findings indicated that undertaking a combination of physical activities is more likely to result in achieving recommended levels of physical activity.

There appears to be merit in promoting brisk walking—particularly walking for transport—as an activity in its own right as well as an activity to be undertaken in combination with other pursuits. This strategy has the potential to increase physical activity levels in the community as well as prevent the dramatic decreases in activity found when adults stop participating in team sports or other vigorous pursuits; thus, it can help in preventing active people from becoming inactive.[21] Increasing walking for transport also has the potential to reduce automobile dependency and thus meet broader community objectives for a healthier, greener, and safer environment.[22]

TABLE 4—Associations Between Walking at Recommended Levels and Individual, Social Environmental, and Physical Environmental Determinant Summary Scores: Logistic Regression Odds Ratios (n = 1688)

	Odds Ratio: Model With All variables	95% Confidence Interval	*P*
Individual determinant score			
Low[a]	1.00		
Medium	1.65	1.16, 2.35	.006
High	3.10	2.20, 4.37	.000
Social environmental determinant score			
Low[a]	1.00		
Medium	1.50	1.05, 2.14	.027
High	2.79	2.00, 3.90	.000
Physical environmental determinant score			
Low[a]	1.00		
Medium	1.36	0.97, 1.90	.073
High	2.13	1.54, 2.94	.000

Note. Model adjustments were made for demographic determinant scores. No interactions were eligible for inclusion in the model.
[a]Reference category.

Consistent with a social ecological view of health behavior,[5,23,24] the present results suggest that a comprehensive strategy is required to increase community levels of walking. Such a strategy would need to create a supportive social and cultural environment and provide an infrastructure that actively encourages walking and the use of public transport. Our results also suggest that strategies are required to increase and maintain levels of confidence that walking can be incorporated into one's daily activities.[25] In addition, positive attitudes toward the process of being physically active need to be reinforced.

The finding that a positive social environment is likely to influence individual behavior is not new.[25] Encouraging people to walk with others, or even with their dog, is associated with achieving recommended levels of walking. It has been shown that dog owners have fewer cardiovascular risk factors and engage in more recreational exercise than others.[26] Moreover, a large proportion of the population owns dogs (in Australia, for example, nearly 4 million people and 2.6 million households report owning a dog[27]). However, the vast majority of dog owners do not engage in a sufficient amount of walking to be classified as walking at recommended levels[28] and a specific strategy for encouraging more dog owners to walk with their dogs is required.[28]

Aspects of the physical environment also appear to be important. Our results showed that walking at recommended levels was associated with having good access to attractive open spaces in the area of the study. The situation may be different in other countries where fear of crime may prevent the public from using local parks.[28] There was also weak evidence that those who achieved recommended levels of walking were more likely to live on a street that was aesthetically pleasing, with minor traffic, trees, sidewalks, or a local shop. Studies of individuals' perceptions of their local environment show correlations between these perceptions and physical activity levels.[29–31] Thus, there is a need for further studies involving better objective measurements of such variables.[32,33]

There is a growing awareness that neighborhood design can influence local walking practices.[5,22,28,34] Beatley has argued that "sustainable living," including walking, cycling, and using public transport, is difficult in the low-density, automobile-dependent neighborhoods characteristic of the United States[17] and Australia. However, even in densely populated cities, such as those in the United Kingdom and parts of Europe, automobile dependency is increasing at the expense of nonmotorized forms of transport such as walking, cycling, and public transportation.[28,34] If this trend is to be reversed, comprehensive interagency strategies are required to address individual, social environmental, and physical environmental factors.

Encouraging more walking for transport is a means of incorporating physical activity into people's daily routine. A good start would be to encourage people to engage in highly achievable activities such as using stairs instead of elevators, parking further away from their destinations, and exiting public transport one stop before their destination. However, from a broader public health perspective, attempts to encourage active commuting generally will produce other benefits.[28,34] For example, passenger vehicles contribute considerably to greenhouse emissions,[35] and a large proportion of motor vehicle trips in the United States and Australia involve distances of 3 km or less.[35,36]

Several limitations of this study must be considered. As detailed fully elsewhere,[8] Perth is a relatively homogeneous city with above average standards of living relative to other Australian capital cities. As a result of financial and practical constraints, our study was restricted to a 408 km^2 area of Perth, and the sample included only healthy workers and homemakers aged 18 to 59 years as a control for potentially confounding variables. Trained interviewers made objective assessments of access to footpaths, shops, traffic, and an aesthetically pleasing environment, but these environmental assessments were restricted to the street on which the respondent lived. To address this weakness, our group is undertaking a more comprehensive study of the extent to which neighborhoods are conducive to walking and cycling.[32,33]

In addition, an alternative measure of access to public open space may have been more appropriate than the spatial access model we used, which adjusted for distance, size, and attractiveness. Finally, because of the exploratory nature of this social ecological study, chance cannot be ruled out as an explanation for some of the results, although our criteria for including variables in the final model were determined a priori. Notwithstanding these limitations, our study appears to be one of the few published investigations to include objectively measured physical environmental factors, and it provides some insights for future investigations.

CONCLUSIONS

Encouraging more walking has the potential to produce public health benefits, both for individuals and for the environment. However, few people engage in a sufficient amount of walking to benefit their health. Moreover, those who walk as well as do other physical activities appear more likely to achieve recommended levels of activity overall. Our results suggest that, if there are to be increases in walking among the general population, a comprehensive strategy must be in place that influences individuals as well as creates more supportive social and physical environments. Such a strategy will require a multilevel approach that involves both the health sector and transportation, planning, and local government agencies. ■

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Contributors

Both authors contributed to the design of the study and the development of survey instruments. B. Giles-Corti developed the environmental measures, analyzed the data, and wrote the article. R.J. Donovan contributed to the interpretation of the findings and to the writing and editing of the article.

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Human Participant Protection

This study was approved by the University of Western Australia human rights committee. Participation in the study was voluntary. Respondents were provided with information about the study and the length of time it would take to complete the questionnaire before they gave consent.

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