



Revolutions for Women:

Increasing women's participation in cycling for recreation and transport

Summary of key findings

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Summary of key findings

1. Introduction

Cycling for recreation and transport has a range of health, environmental, social and community benefits. Cycling as a form of moderate to vigorous intensity physical activity can contribute to the multiple health benefits associated with an active lifestyle (Hendriksen et al 2000; Wagner et al 2001). These include reduced all-cause mortality (Kujala et al 1998), reduced risk of coronary heart disease (Manson et al 1999), stroke (Ellekjaer et al 2000), respiratory disease (Rockhill et al 2001), colon cancer (Friedenreich & Orenstein 2002), breast cancer (Friedenreich & Orenstein 2002) and type 2 diabetes (Hu et al 1999). Moderate intensity exercise such as cycling assists weight management (Fogelholm & Kukkonen-Harjula 2000) and smoking cessation (Marcus et al 1999), reduces levels of depression and stress, improves mood, and raises levels of self-esteem (Sculley et al 1999). Recent research indicates that physical activity also improves cognitive functioning (van Gelder et al 2004; van Praag et al 2005; Weuve et al 2004).

Cycling is also associated with a range of additional health, social and environmental benefits due to its complementary role as a form of transport. Cycling for transport is a low-cost, convenient and energy-efficient means of personal mobility that contributes to cleaner air, less congested cities and more people-friendly, liveable communities (Carlos & Phillips 2000).

Cycling can also contribute to social inclusion because it provides an affordable and convenient form of personal mobility that is accessible to people who do not own or have access to a motor vehicle. Transport costs (principally motor vehicle related) account for a high proportion (16%) of household expenditure on goods and

services – second only to expenditure on food and non-alcoholic beverages (17%), and similar to housing costs (16%) (ABS 2006). One in 10 households in the Melbourne metropolitan area does not have a motor vehicle, rising to approximately 30 per cent in some disadvantaged suburbs of Melbourne (Department of Sustainability and Environment nd). Studies in the UK have identified that a high proportion of households without a car experience difficulties visiting family and friends, and accessing employment, shops and health services (Social Exclusion Unit 2003).

Cycling is a form of physical activity and mode of transport that lends itself to participation by a diverse range of population groups. In countries that have developed a culture of active transport and recreation, cycling is an inclusive, population-wide activity that includes children, seniors, women, ethnically and culturally diverse groups, and disadvantaged population groups (Pucher & Dijkstra 2003; Social Exclusion Unit 2003). In countries such as Germany, Denmark, the Netherlands and Japan, a high proportion of children cycle to school, women cycle as frequently as men, and, in some cases, the majority of trips taken by seniors (65+ years) are active trips (cycling and walking) (Pucher & Dijkstra 2003). These diverse population groups frequently achieve adequate levels of physical activity 'incidentally', at low cost, without having to find the time and money to participate in organised sports, exercise or fitness programs.

Although cycling features in the top five sport and recreation activities in Australia (Standing Committee on Recreation and Sport 2005), cycling frequency, particularly cycling for transport, is low relative to international levels, and substantial gender differences occur for all forms of cycling (recreation, transport and sport). Australian women's rates of cycling for transport are about one-third of the male rate, and for recreation the female rate is approximately half that of men (VicRoads nd; Standing Committee on Recreation and Sport 2005). These gender differences do not occur in a

number of western European and Asian countries, where women's rates of cycling are often higher than those of men. These international data challenge the assumption that cycling is an inherently gendered activity, suggesting instead that environmental, social and cultural factors are likely to play an important role in women's participation in cycling.

In light of the health, social, community and environmental benefits of cycling, and data indicating no similar gender differences among several European and Asian populations, the gender difference in cycling participation in Australia warrants investigation. This study was established to investigate gender differences in cycling, and identify successful interventions for promoting cycling for women.

2. Study objectives

The study objectives were to:

- 1 Identify the motivations, supports and constraints associated with women's participation in cycling.
- 2 Conduct case studies of a range of programs and initiatives that have been developed and implemented to promote women's participation in cycling, to identify critical success factors.
- 3 Develop recommendations for strategies and programs to increase women's participation in cycling.
- 4 Develop and disseminate guidelines for cycling programs and initiatives that address women's needs.

This report presents the research findings related to objectives 1 to 3.



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3. Study design and methods

The study was conducted in two phases: (i) case studies of women's cycling programs; and (ii) an online survey of female and male cyclists.

3.1 Case studies

Case studies of six community-based initiatives aimed at increasing women's participation in cycling were conducted, based on program observation (4 programs), individual semi-structured, qualitative interviews with program coordinators (8), and focus group discussions with program participants (6 focus groups, 50 women).

3.2 Online survey

An online survey of female and male cyclists was conducted in partnership with Bicycle Victoria (BV). A random sample of 10,000 members and contacts of Bicycle Victoria aged 18 years or over received an email message on 23rd November 2005 inviting them to participate in the survey. 2403 respondents submitted a completed survey by 22nd December 2005, the majority in the first week the survey was open. The response rate (24% crude response rate; 28% adjusted for estimated levels of non-working, dormant and infrequently accessed email addresses) was relatively low, though common for online surveys.

Despite low response rates, online surveys can result in representative samples of respondents (Bethell et al 2004; Koch and Emrey 2001). Nevertheless, caution needs to be used in generalising the findings to all individuals on the Bicycle Victoria database of members and contacts (the sampling frame for the survey). It is also important to bear in mind that individuals on the Bicycle Victoria database are not representative of all cyclists in Victoria. This study limitation was offset by the advantages of obtaining detailed information from a relatively large number of female and male cyclists quickly and at low cost.

This enabled the gender comparisons that were the focus of the study to be conducted.

The online survey included questions about: frequency and duration of cycling for recreation and transport; reasons for commencing and continuing cycling; constraints on cycling; experiences of intentional harassment from motor vehicle occupants; participation in cycling programs and events; and overall levels of physical activity. Response categories for the closed-ended questions asking about motivations, supports and constraints on cycling were developed from key themes and issues derived from the earlier qualitative phase of the study.

3.3 Data analysis

Qualitative data were analysed descriptively based on a combination of both pre-determined and emergent themes.

Quantitative data were imported into SPSS for Windows (version 12.0.1) and analysed using descriptive statistics, Pearson's chi-square tests for differences in proportions, independent t-tests for differences in means, and logistic regression for identifying variables associated with intentional harassment from motor vehicle occupants. Unless otherwise stated, reported differences are significant at the 5 per cent significance level.

4. Key findings – qualitative component (case studies)

These findings are based on interviews and focus group discussions with female cyclists and coordinators of women's cycling programs.

4.1 Participant characteristics

Program and study participants ranged in age from 20 to 80 years and included

students, full-time parents, part-time and full-time employees, and retirees. Participants lived in Melbourne, Canberra and the regional city of Geelong, and most were novice cyclists or returning to cycling after having cycled as a child. The majority cycled for recreation, but some cycled for transport, and others competed in triathlons and bicycle races.

4.2 Reasons for commencing and continuing cycling

When discussing reasons for *commencing or returning to cycling*, women frequently mentioned health and fitness; relaxation and stress reduction; preparing for cycling events or activities (often seen as a new personal goal or challenge); and the opportunity to learn new skills. Social factors were also important and included being active with other family members (partners, children); the desire to be an active role model for their children; and encouragement from family, friends, or workmates.

Key factors for *continuing cycling* included a sense of fun, independence and enjoyment associated with cycling as a form of mobility; enjoyment of training sessions and cycling events – including the social interactions; being able to incorporate activity into their busy lives; setting and achieving cycling goals; learning new skills in a safe and supportive environment; increased self-confidence (cycling-specific, but also in life in general); and contact with 'realistic' role models (rather than elite cyclists).

4.3 Constraints on cycling

Constraints on cycling included personal and socio-environmental factors.

Key *personal factors* mentioned by women were lack of confidence and cycling skills (especially cycling in traffic and in groups), and lack of fitness and associated concerns about keeping up, 'getting dropped' and slowing others down. Novice women reported concerns about the need to *simultaneously* master



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a number of new skills, including operating the bicycle while at the same time negotiating road and path hazards in an environment (other traffic) that was perceived as hazardous. Manoeuvres such as merging with traffic to do a right hand turn, and negotiating roundabouts with other traffic were challenging for novice cyclists.

Key *socio-environmental* constraints on cycling described by women included adverse traffic conditions (risks associated with sharing the road with motor vehicles); driver aggression and assault; end of trip facilities and bike security (for women who cycle for transport); cultural norms about appropriate cycling clothing and appearance; dress and appearance codes at work and meetings (when arriving by bicycle); and getting the right advice in a 'blokey' bicycle retail environment (technical language, limited choices for women's bicycles and clothing).

4.4 Supports for cycling

When discussing supports for cycling, women frequently mentioned supportive programs and people, cycling groups or clubs, cycling events, and cycling conditions.

Women's cycling *programs* were important for novice women who wanted to achieve new cycling goals and challenges, and acquire new skills, but to do so within a safe, friendly and supportive environment. The characteristics of successful women's cycling programs are described below in Sections 4.5 and 4.6.

Supportive *people* included cycling program coordinators (usually, but not always women) who conducted programs based on participants' needs and levels of experience; the coaches, mentors and role models who assisted them to do 'risky' things safely (eg ride on-road) and encouraged them to attempt new cycling challenges (eg a longer cycling event); verbal and practical support from partners, family, friends and work colleagues; 'realistic' role models rather than elite cyclists; and other women who, by cycling to

work, contribute to commuter cycling becoming more normative behaviour.

Women expressed a number of preferences regarding *cycling groups or clubs*. Many women enjoyed the social interaction of cycling with a group, and reported feeling safer riding in a group. Participating in rides (social and training) with other women helped them do things they would not do on their own (eg riding on the road). Women are more likely to join groups that have a similar standard of cycling as their own, and/or provide support for less experienced newcomers. Because women who join cycling groups (particularly the 'fitness/training' oriented groups) often improve rapidly, integrating newcomers is a challenge. The more successful groups are those that are able to maintain the interest and involvement of existing members, while catering for the needs of less experienced cyclists (see Sections 4.5 and 4.6 below). The continuity of the sessions (ie knowing that someone will be there), together with social activities during, after or in addition to rides were also important for sustaining participation.

Supportive *cycling conditions* included modern, well-equipped bicycles, facilities at work (eg showers, secure bicycle storage); and safe cycling routes – women preferred off-road paths both for recreation and transport. Safe and pleasant environments for cycling were particularly important for recreational cyclists, especially for older women. These women generally preferred off-road paths or quiet roads, and achievable distances and cycling pace. Women felt more comfortable about cycling in traffic when they gained skills and experience, and did it with other more experienced cyclists who acted as role models.

Women often commenced cycling to participate in a *cycling event* or tour, or to ride to work. The women in this study preferred events that emphasised and rewarded participation among all ages and abilities, rather than competition. Female-only events (eg triathlons and rides) were popular among novice cyclists, not just because only women were participating, but also

because the event could be shaped to meet women's needs and preferences (eg time, location, distance, and recognition of participation rather than 'winning').

4.5 Characteristics of successful community-based cycling programs for women – beginning cyclists

Study participants spoke very positively about the programs they had participated in. Positive features included a supportive, friendly and patient learning environment that enabled women to learn at their own pace; achieving a balance of basic theory and hands-on practice; getting the 'technical talk' level right; accessibility in terms of time, place and cost; incorporating individual goal-setting and practical planning; confident leadership; and positive reinforcement for their efforts. Provision of on-going activities such as training sessions, social rides and cycling events matched to women's cycling abilities were important for sustaining cycling. Women suggested that 'one-off' programs should also provide local community links to sustain cycling (clubs, groups, cycling events, female-friendly bike shops).

4.6 Characteristics of successful community-based cycling programs for women – more experienced cyclists

More experienced cyclists sought programs and resources that provided more specialised skills; quality, affordable coaching for improved performance; access to on-going cycling groups at the right level; advice on bicycle technology and equipment; support to achieve new goals and challenges; and effective methods of communication about events and training sessions. The social aspects of



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programs, groups and events were also important for the more experienced cyclists.

5. Key findings – quantitative component (online survey)

5.1 The study sample

Survey respondents (N = 2403) were 32.6% female and 67.4% male, had a mean age of 43 years, and lived mainly in Victoria (87.1%). Respondents had a similar age distribution and mean age (43 years) as the sampling frame (44 years), but a lower proportion of females (32.6%, 39.3% respectively).

The majority of respondents (82.5%) were experienced cyclists (cycling for more than two years). More females (23.4%) than males (14.5%) were inexperienced cyclists. Respondents had cycled for a mean of 11.2 years, and a median of 8 years, and nearly all respondents (98.4%) had cycled in the previous 12 months.

5.2 Cycling purpose and frequency

Most respondents cycled for recreation (91%), followed by transport (58%) and competition (13%). The only significant gender difference was that females (10.2%) were less likely than males (14.9%) to cycle for competition. Eighty-one percent of respondents cycled at least once a week, including nearly one in four respondents who cycled every day. Males (27.2%) were more likely than females (21.2%) to cycle every day, or at least once a week (58.0%, 51.8% respectively).

5.2.1 Cycling for transport

Respondents who had cycled for transport in the previous week (n = 1249) cycled an average of 5.3 times, taking an average of 45 minutes per trip. Based on an average speed of 15-20

km/hr, average trip lengths were 11.3-15.1 km. There were no significant gender or cycling experience differences in trip frequency or duration.

This relatively long trip distance (compared with international data) is consistent with the most common trip being journey to work (rather than shorter local trips), and the journey to work serving as a form of exercise or fitness training (see Section 5.3).

Respondents cycle for transport principally on roads with no bicycle facilities (83.2% of females, and 86.9% of males). On-road bike lanes (77.7% females, 71.5% males) and off-road paths (64.6% females, 64.4% males) were used by progressively smaller numbers of respondents. This pattern of use of different types of cycling facilities is influenced by availability rather than choice. Few respondents (6% females, 12% males) preferred to cycle for transport on roads with no bicycle facilities. Consequently, the most commonly used facilities (roads with no bicycle facilities) were the least preferred option.

The large use/preference mismatch associated with cycling on roads with no bicycle facilities was less marked for on-road bike lanes and off-road paths. Females were more likely to use on-road bike lanes than off-road paths, but showed similar preferences for these two types of bicycle facility. Males were also more likely to use on-road bike lanes than off-road paths, but, unlike females, they expressed a greater preference for on-road lanes. These findings, of females generally preferring greater separation from motor vehicle traffic than males, are consistent with other studies, and are likely to reflect females' greater aversion to risk-taking behaviours in general (Byrnes 1999).

The principal trip destination for respondents who cycled for transport was 'work' (70%), followed by 'recreation venue' (14.3%) and 'shops' (7.7%). This pattern of utilitarian cycling (primarily fairly long distances to work) differs from other studies (including international studies), suggesting that this cycling population (Bicycle Victoria

members and contacts) uses the journey to work principally for health and fitness 'training'. This is consistent with the principal reason for cycling being 'health and fitness' (see Section 5.3).

5.2.2 Cycling for recreation

Respondents who had cycled for recreation in the previous week (n = 1530) cycled an average of 2.5 times, and the average trip took 1 hour 46 minutes. Males and females cycled a similar number of times, but males spent longer cycling for recreation than females (4.6 hours, 3.9 hours respectively).

Respondents cycled for recreation principally on roads with no bicycle facilities (67.6% of females, and 74.4% of males). Off-road paths (59.9% females, 53.4% males) and on-road bike lanes (50.1% females, 47.6% males) were used by smaller numbers of respondents. As was the case for cycling for transport, this pattern of use of different types of cycling facilities is influenced by availability rather than choice. Few respondents (15% females, 26% males) preferred to cycle for recreation on roads with no bicycle facilities.

Once again, the most commonly used facilities (roads with no bicycle facilities) were the least preferred option. Nevertheless, relatively more males than females cycled for recreation on the road (with no bike lanes) and preferred to do so. Conversely, females were more likely than males to cycle for recreation on off-road paths and to prefer off-road paths. Female and male patterns of use and preferences for on-road bicycle lanes were similar.

These findings suggest somewhat different patterns of recreational cycling among females and males, with females preferring more 'leisure' oriented recreational cycling on off-road paths, and men preferring more 'fitness' oriented cycling on the roads.

When cycling to and from respondents' trip destination (principally work) is treated as one trip, there were no significant differences in either the



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number or duration of weekly recreation compared with transport trips.

Respondents were a very active population group, spending an average of 6.1 hours cycling for transport and/or recreation in the previous week (n = 1934).

5.3 Reasons for commencing and continuing cycling

Respondents were asked to rate the importance of 21 factors for (i) commencing and (ii) continuing cycling on a four-point scale: not important at all (0); slightly important (1); important (2); very important (3).

The most important reasons for **commencing** cycling were 'health and fitness' (mean score 2.56), 'building physical activity into a busy lifestyle' (2.24), 'fun and enjoyment' (2.24), 'getting outside in the fresh air' (2.04) and 'relaxation and/or stress reduction' (1.99). In general, personal health, fitness and wellbeing factors were important reasons for both males and females to commence cycling. Social, family, environmental and economic factors were more important for women than men, while the low impact nature of cycling, and bicycle racing were more important for men than women.

The five factors considered by respondents to be the most important reasons for **continuing** to cycle, were the same as those considered most important for commencing cycling, mostly in the same order. The mean importance score for all five factors increased for 'continuing' compared with 'commencing' cycling, but 'relaxation/stress reduction' had the greatest proportional increase (14.6%) among these five factors. These findings suggest that, for this sample, motivating factors for cycling are reinforced with cycling experience.

Overall, 17 out of 21 factors showed an increase in mean importance, with the greatest proportional increase being for 'environmental concerns' (23.9%). This suggests that environmental concerns may become more important after exposure to a 'cycling culture'.

Cycling is often promoted as a cheap form of transport, but respondents rated cycling as a *convenient* form of transport as more important for both commencing and continuing cycling than cycling as a cheap form of transport. This may change as the price of petrol continues to increase.

5.4 Constraints on cycling

The five most important constraints on cycling were predominantly socio-environmental constraints: lack of time (mean score 1.59¹); concerns about cycling in traffic (1.55); aggression from motorists (1.29); bad weather (1.23); and inhaling car fumes (1.12). Three of these five most important constraints on cycling can be addressed through improved cycling infrastructure and/or improved interactions between cyclists and motorists.

Fifteen other listed constraints all had mean scores less than 0.5 (ie between 'no constraint' and 'minor constraint').

Females showed a similar overall pattern of constraints as males, but there were some significant differences. 'Concerns about cycling in traffic', 'aggression from motorists', 'inhaling car fumes when cycling on the road', 'lack of confidence in bicycle maintenance', 'lack of confidence in cycling ability' and 'lack of confidence in cycling skills' were rated as significantly more important constraints by females than males.

Several other constraints were significantly more important for females than males (eg lack of knowledge of local cycling routes, feeling self-conscious in cycling clothing, difficulty 'keeping up' on rides), even though, overall, they were not perceived to be major constraints. Having to wear a bicycle helmet was the least important constraint for both females and males, and there was no gender difference.

5.5 Harassment from motor vehicle occupants

Consistent findings from this and other studies indicate that road safety concerns and driver behaviour are major constraints on cycling for women. Two thirds of respondents had experienced intentional harassment from motorists or passengers in the previous year. The most frequent forms of harassment (from seven response categories provided) were: deliberately driving too close, causing fear/anxiety; shouting abuse; sounding the horn in an aggressive manner; obscene gestures; and blocking your path.

While females reported harassment from motorists as a significantly more important constraint on cycling than males (see Section 5.4), more males (70.5%) than females (56.6%) actually reported experiencing intentional harassment in the previous year. The gender difference in experience of harassment remained after adjustment for time spent cycling, age, cycling experience, and cycling purpose (transport and/or recreation). Younger cyclists and those who had been cycling for more than two years were also more likely to report intentional harassment from motorists in the previous year.

5.6 Participation in cycling programs and events

Nearly one in ten respondents reported having participated in a cycling program in the previous 12 months, with females more likely to have done so than males (12.1%, 6.9% respectively), and inexperienced cyclists more likely than experienced cyclists (14.0%, 7.5%). Programs predominantly focused on bicycle maintenance (90 respondents), cycling skills (37 respondents) and training for a bicycle event (17 respondents).

Participation in cycling events was more prevalent than participation in cycling programs. More than half of respondents (57%) had participated in a cycling event in the previous 12 months, with inexperienced cyclists (66%) more

¹ No constraint (0); minor constraint (1); moderate constraint (2); major constraint (3)



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likely to have done so than experienced cyclists (54.5%). There was a tendency for more males to have participated in a cycling event, but the difference was marginally non-significant. For respondents who had participated in a cycling event, the average number of events was 2.8 events over the previous 12 months. Males (3.0 events) participated in significantly more cycling events than females (2.3 events) over this period. Experienced cyclists (3.0 events) participated in a greater number of events than inexperienced cyclists (1.7 events).

5.7 Physical activity participation

Participants' physical activity levels were measured using the eight core questions in the Active Australia Survey instrument (Australian Institute of Health and Welfare (AIHW) 2003).

Cyclists in this study are a very physically active population group. 78.7% of men and 79.1% of women achieve sufficient time (≥ 150 minutes of moderate intensity physical activity per week) and sessions (≥ 5 per week) of activity to achieve a health benefit (defined as 'adequately active'). In comparison, for Australians aged 18-75 years, approximately 47% of men and 43% of women are adequately active (Armstrong et al 2000). Respondents in this study had the same mean age as respondents in the 1999 Active Australia Survey (43 years) (Armstrong et al 2000).

In addition, the proportion of adequately active respondents did not decline with age as it does for the Australian population. The proportion of adequately active respondents is similar across all age groups, while in the Australian population, the proportion declines from 58% of 18-29 year-olds to an average of 42% for 30-75 year-olds.

Respondents also had high levels of *vigorous* physical activity², which are associated with additional health benefits. Males and females participated in 5.1 and 4.1 hours respectively of vigorous physical activity per week. Male respondents spent, on average, 3.8

more hours per week doing vigorous physical activity than the average adult Australian male, and female participants an additional 3.3 hours. Participation in vigorous physical activity did not decline significantly with age.

Consistent with these high levels of physical activity, approximately three-quarters of respondents reported increased levels of physical activity since commencing cycling. This is also consistent with 'health and fitness' being the most important reason for both commencing and maintaining cycling.

6. Conclusions

This study is the most comprehensive investigation of gender differences in cycling in Australia, and possibly in the world. Qualitative interviews with participants and coordinators of women's cycling programs were conducted, together with observations of a small number of programs. These qualitative data provided insights into females' motivations, supports and constraints for cycling, and the characteristics of successful community-based cycling programs for women. These determinants of cycling were then examined quantitatively through an online survey of female ($n = 696$) and male ($n = 1441$) cyclists.

Survey findings indicated that females and males have similar overall patterns of motivations, supports and constraints on cycling. Significant differences were identified, but these did not result in a markedly different pattern of female and male determinants of cycling.

This finding was unexpected given the large gender differences in cycling in Australia. It suggests that promoting cycling for women will be maximised by strategies directed at the whole population, as well as interventions specifically targeting women. Additional evidence for the value of a population-wide approach for promoting cycling for women comes from cross-country comparisons of gender differences in cycling. Countries with high rates of cycling for transport and recreation have few gender differences in cycling, while

countries such as Australia, which have relatively low rates of cycling (particularly for transport), have large gender differences in cycling (Garrard 2003). Female participation in cycling appears to be an indicator of a cycling friendly culture and environment, with each contributing to the other interactively.

Population-wide strategies that potentially reach the whole population, including women, include:

- creating cycling-friendly environments and policies (eg bicycle paths and lanes, traffic calming, incorporating greater cycling-awareness among motorists, for example, through motor vehicle licence-testing)
- enforcement of road safety measures (eg speeding and distracted driving)
- mass-media promotion, both of cycling and also of mutual respect between cyclists and motorists.

These population-wide strategies address three of the five most important constraints on cycling for both females and males (concerns about cycling in traffic, aggression from motorists, and inhaling car fumes). These three factors were also significantly more important for females than males.

The finding that women are more concerned about harassment from motorists, but men experience more harassment, suggests that women are particularly sensitive to driver behaviour that is perceived to be dangerous or threatening. This finding might help to explain at least some of the gender differences in cycling cross-nationally, as there is some evidence that aggressive driving behaviour is more prevalent in Australia than in 15 Member States of the European Union (EOS Gallup Europe 2003), several of which have high rates of cycling by both men and women. Strategies (such as those outlined above) that promote mutual tolerance, patience and respect between cyclists and motorists will help address this important constraint on cycling, particularly for women.

While similar overall patterns of motivations, supports and constraints

² In the Active Australia Survey questionnaire, cycling is included as an example of vigorous physical activity (AIHW 2003)



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on cycling for females and males suggest the value of population-wide approaches for promoting cycling for women, some important gender differences at the more 'micro' level can assist in planning complementary targeted interventions for women.

Target interventions for women should take into account the following factors.

In terms of motivating women to commence and continue cycling, messages should focus on: health and fitness; building physical activity into a busy lifestyle; fun and enjoyment; getting outside in the fresh air; and relaxation/stress reduction. Of less importance overall, but relatively more important for women than men, are: being active with families, partners or children; environmental benefits; a new challenge; and encouragement from family and friends.

Cycling events, programs and campaigns were less important motivations for women's cycling than the factors outlined above, suggesting the greater overall importance of the more informal individual, family, social and community influences and activities. Nevertheless, cycling programs appear to be important for a sub-set of novice female cyclists. Participants in the women's cycling programs in this study spoke very positively of programs that addressed cycling skills (including operating a bicycle and cycling in traffic);

bicycle selection, setup and maintenance; and knowledge of local cycling routes. These program elements addressed constraints which, while not major constraints for women overall, were substantially more important constraints for women than men.

Cycling events, such as those organised by Bicycle Victoria, were more important motivations for women's cycling than cycling programs, probably reflecting their greater number and size, and therefore population reach. Given that more than half of survey respondents had participated in a cycling event in the previous 12 months, an interaction between the key motivations for cycling (health and fitness, fun and enjoyment, getting outside in the fresh air, and relaxation/stress reduction) and participation in cycling events is likely.

Finally, promoting cycling for recreation and transport represents a good investment in individual and community health and wellbeing for women and men. Participants in this study (both females and males) are a very active population group. They are nearly twice as likely to be adequately active as the adult Australian population, and they also participate in substantially higher levels of vigorous physical activity which is associated with additional health benefits. Unlike the Australian population, their physical activity rates did not decline with age. While these findings cannot be generalised to all cyclists in Victoria, they suggest that

cycling is a form of physical activity that lends itself to frequent participation, for relatively long periods of time, across the lifespan.

The opportunity to combine physical activity with transport is a particularly appealing combination for busy people who have difficulty finding time for physical activity, and more than half of the participants in this study cycle for transport. This brings additional social benefits in the form of increased social inclusion through more equitable access to personal mobility, cleaner air, less congested cities and more people-friendly, liveable communities (Carlos & Phillips 2000).

If a greater proportion of Australian women are to obtain the individual health and wellbeing benefits of cycling, as well as contributing to the additional environmental, social and community benefits associated with a shift towards cycling as a sustainable and active form of transport, both population-wide interventions and programs, events, and groups specifically targeting women are required. The findings from this landmark study of gender differences in cycling in Victoria will be used to advocate for population-wide interventions to create supportive physical, social and cultural environments for female (and male) cycling, and to develop guidelines for community-based programs and activities aimed at promoting cycling for women.



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