



Green space, mental health, and physical activity

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How does greener urban space positively affect mental health?



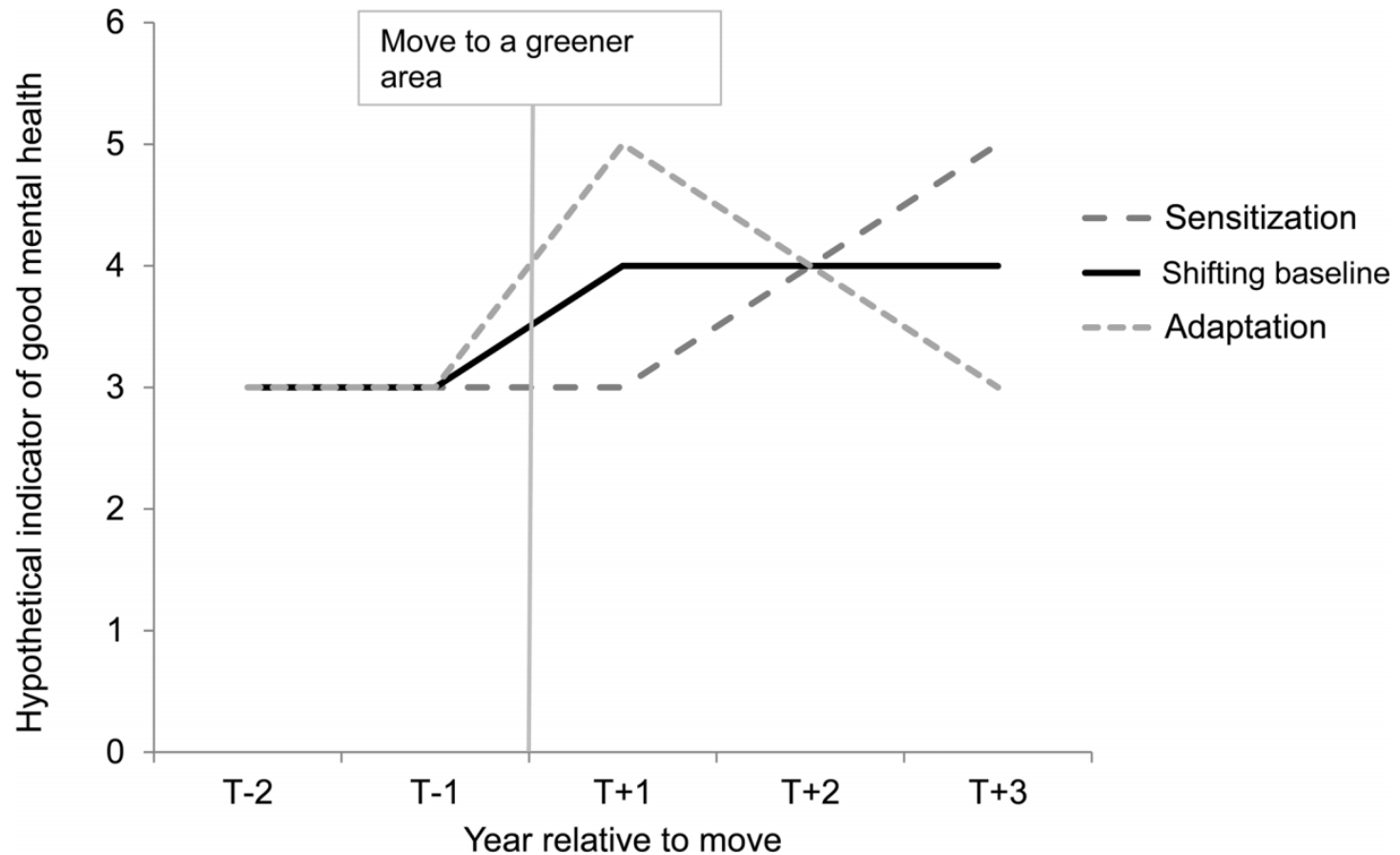
Green space and mental health

- British Household Panel Survey (1991-2008).
- Urban residents of England (84% of sample).
- Mental health measures:
 - Mental distress – GHQ12 (18 years, 5,320 observations for 1,064 people).
 - How you feel in the “past few weeks” for six positive and six negative affective states.
 - Used to aid diagnoses of clinical anxiety and depression.
- Mental health assessed from 2 years before until 3 years after relocation to a greener urban area.

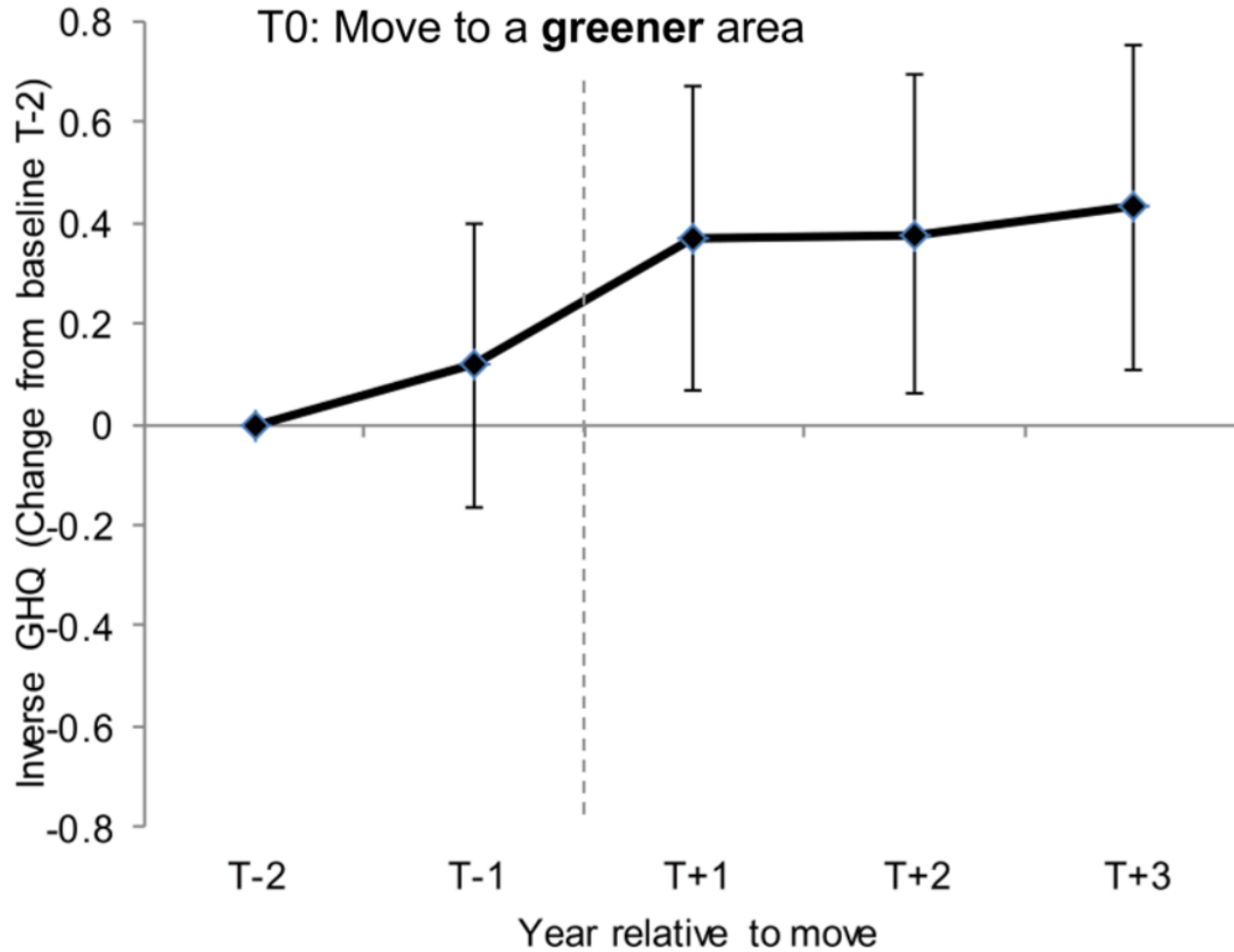
Alcock, I., White, M. P., Wheeler, B. W., Fleming, L. E., & Depledge, M. H. (2014). Longitudinal effects on mental health of moving to greener and less green urban areas. *Environmental science & technology*, 48(2), 1247-1255.



Green space and mental health

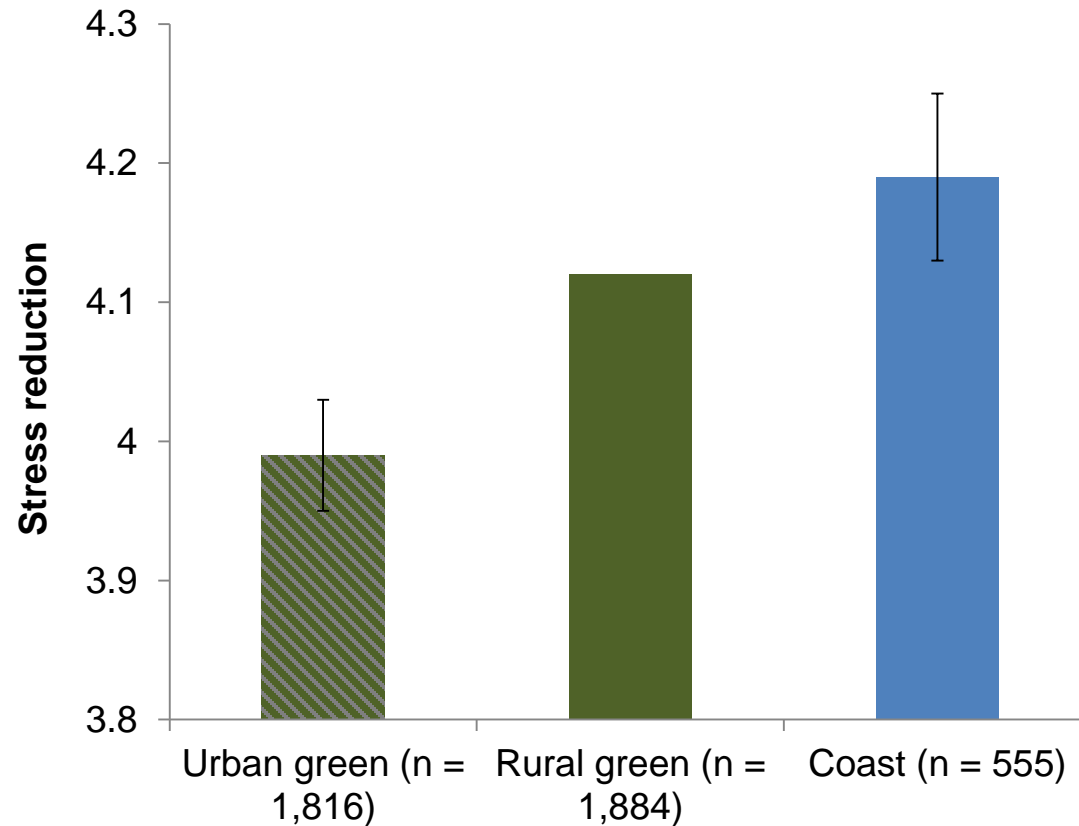


Green space and mental health



Green space and mental health

- How?
 - Visits: Restorative or stress reducing.
- Visits to the coast associated with greater stress reduction.

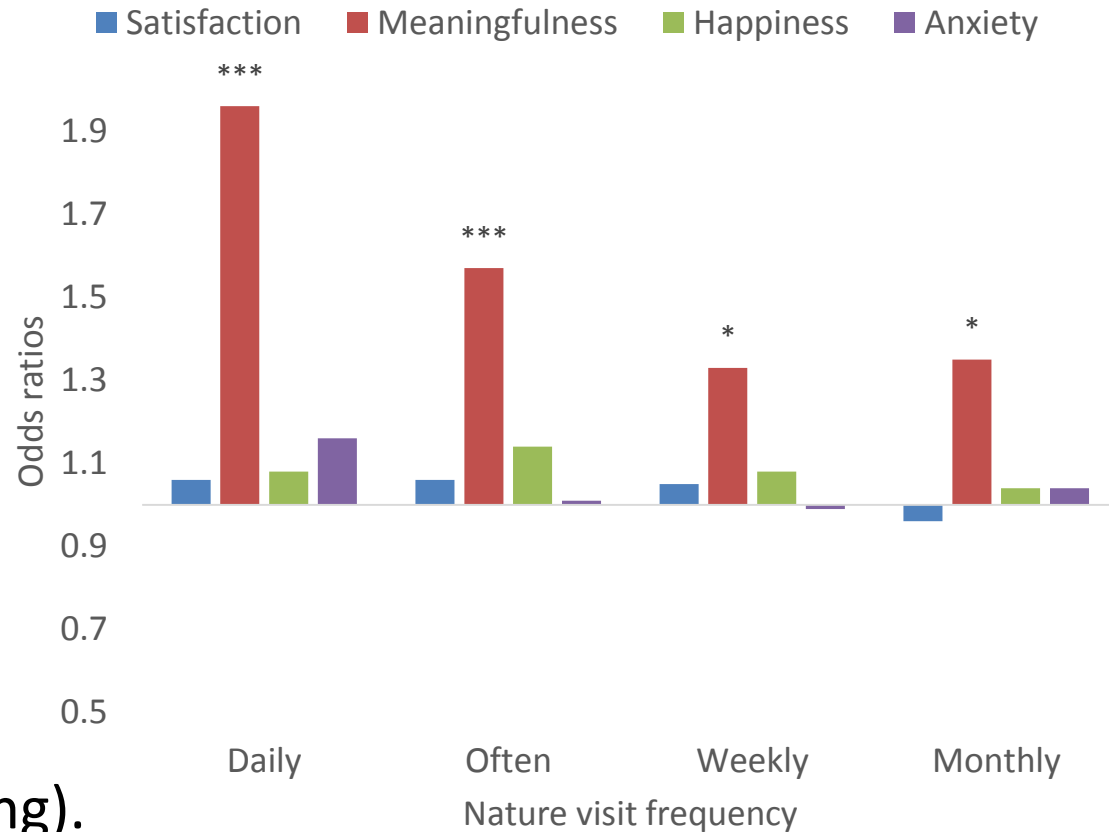


White, M. P., Pahl, S., Ashbullby, K., Herbert, S., & Depledge, M. H. (2013). Feelings of restoration from recent nature visits. *Journal of Environmental Psychology*, 35, 40-51.



Green space and mental health

- How?
 - Visits: Meaningful.
- Frequent visits to natural environments were associated with more *eudaimonic* well-being (but not other types of well-being).



White, M. P., Pahl, S., Wheeler, B. W., Depledge, M. H., & Fleming, L. E. (2017). Natural environments and subjective wellbeing: Different types of exposure are associated with different aspects of wellbeing. *Health & Place*, 45, 77-84.



Green space and mental health

- How?
 - Visits: Loneliness/social cohesion.
- In a study of 4,000 residents of 4 European cities, each additional hour spent in green space per month was associated with small (but significant) increases in mental health and vitality scores.
- 23% of this association could be explained by reductions in loneliness.
 - ...but only significant when combined with leisure-time **physical activity** = 30% explained.

van den Berg, M. M., et al. (2017). Do Physical Activity, Social Cohesion, and Loneliness Mediate the Association Between Time Spent Visiting Green Space and Mental Health?. *Environment and Behavior*.



Green space and mental health

- How?
 - Physical activity.
 - Probably the most studied and evidenced mediator of the greenspace-mental health relationship.
- The odds of poor mental health were **45% less** for people who regularly undertook physical activity in forests/woodlands (compared to non-users).
 - ...but so was regular physically active use of non-natural environments.
- Maybe the effects of physical activity on mental health ‘wash out’ any additional effect of the environment.

Mitchell, R. (2013). Is physical activity in natural environments better for mental health than physical activity in other environments? *Social Science & Medicine*, 91, 130-134.



Why does physical activity in green space deliver greater health benefits?



Green space and physical activity

- A review of 11 studies comparing physical activity in green space compared to indoors found:
 - 4 studies showed significantly improved **positive emotions**.
 - 4 studies showed significantly reduced **negative emotions**.
 - 5 studies showed increased **feelings of energy and revitalisation**.
 - 5 studies showed that people **enjoyed** physical activity more.
 - 2 studies showed that people were more likely to **repeat the activity**.
- Another review found broadly similar results versus more urbanised environments (Bowler et al., 2010).

Thompson Coon, J., et al. (2011). Does participating in physical activity in outdoor natural environments have a greater effect on physical and mental wellbeing than physical activity indoors? A systematic review. *Environmental science & technology*, 45(5), 1761-1772.

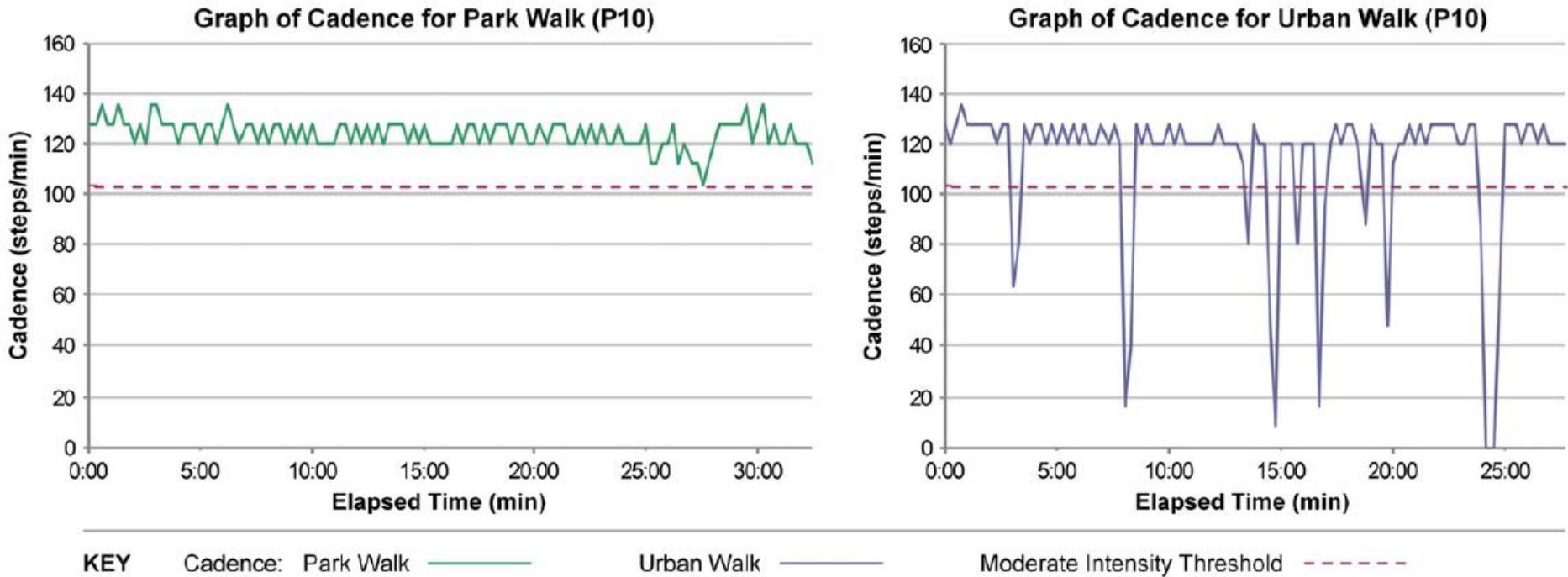


Green space and physical activity

- Why?
 - Less interrupted bouts of brisk walking?
 - 40 adults recruited to walk in both:
 - A park in Glasgow.
 - An urban centre in Glasgow.
 - Participants wore an *activePAL* accelerometer.



Green space and physical activity



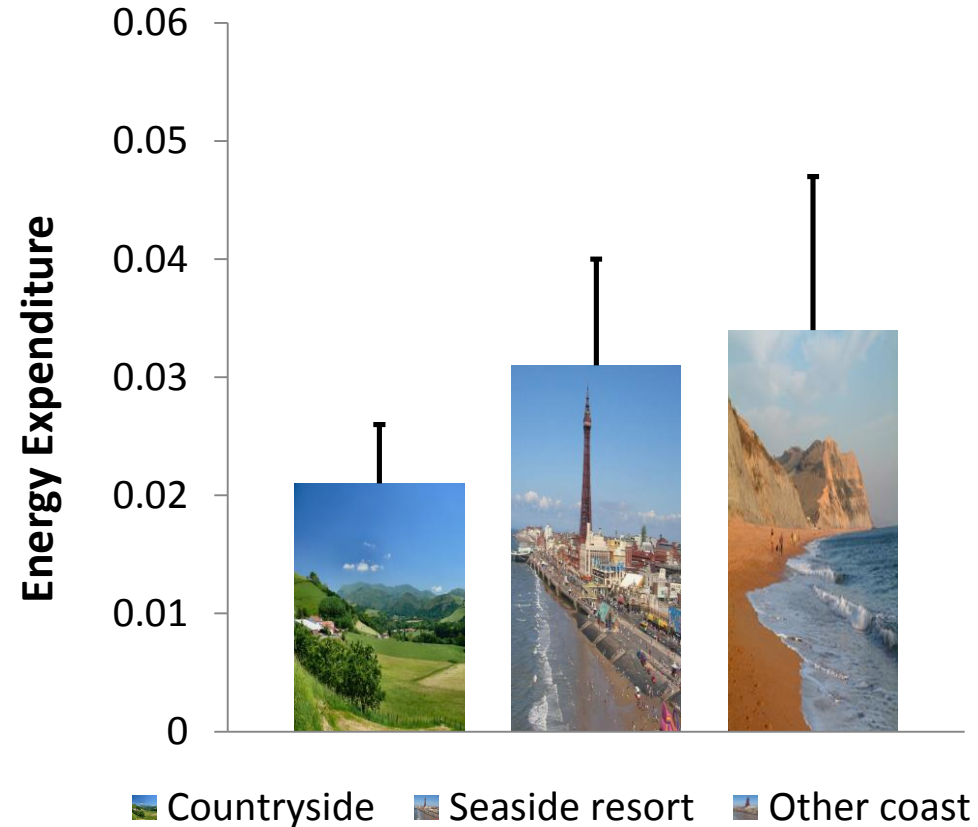
- More steps, more time spent in moderate-to-vigorous physical activity, and fewer interruptions.

Sellers, C. E., Grant, P. M., Ryan, C. G., O'Kane, C., Raw, K., & Conn, D. (2012). Take a walk in the park? A cross-over pilot trial comparing brisk walking in two different environments: Park and urban. *Preventive medicine*, 55(5), 438-443.



Green space and physical activity

- Why?
 - Greater volume of health-enhancing physical activity (whether you intend to, or not).
 - Compared to more urban spaces, visits to countryside spaces and coasts, were associated with greater energy expenditure.



Elliott, L. R., White, M. P., Taylor, A. H., & Herbert, S. (2015). Energy expenditure on recreational visits to different natural environments. *Social Science & Medicine*, 139, 53-60.



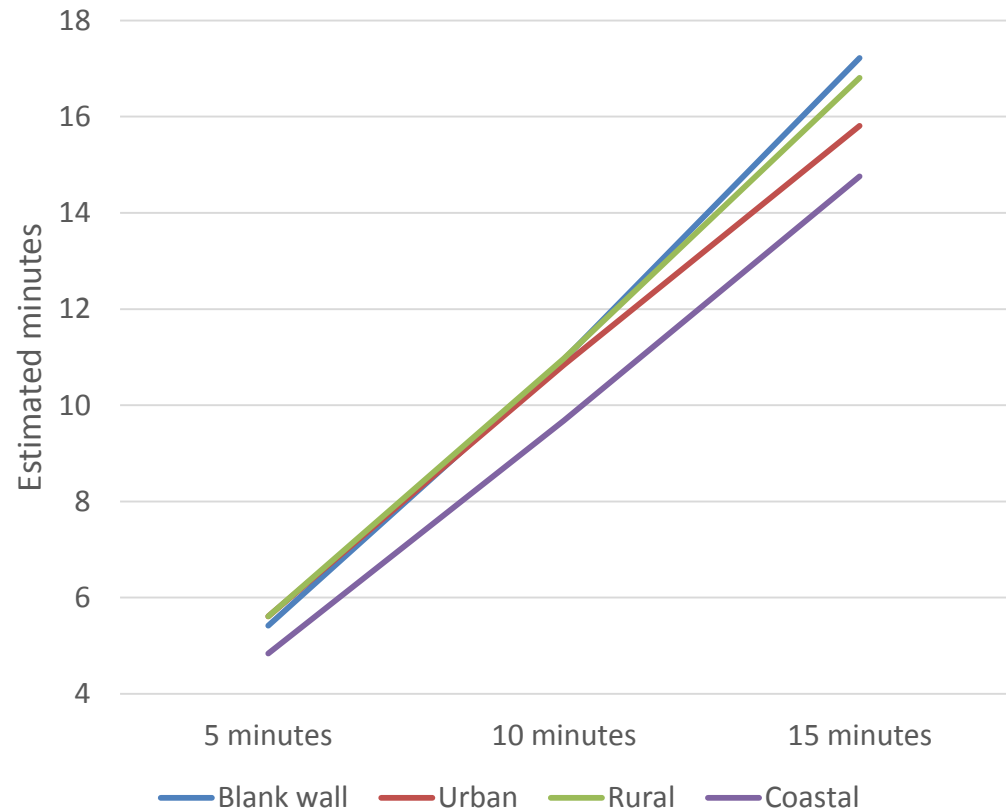
Green space and physical activity

- Why?
 - Because time passes slower?
- 37 postmenopausal women cycled for 15 minutes watching either a blank wall, an urban scene, a rural scene, or a coastal scene.
- At 5, 10 and 15 minutes, they were asked how much time had passed.



Green space and physical activity

- Only in the coastal condition did people significantly underestimate how much time had passed.



White, M. P., et al. (2015). The effects of exercising in different natural environments on psycho-physiological outcomes in post-menopausal women: A simulation study. *International journal of environmental research and public health*, 12(9), 11929-11953.



Green space and physical activity

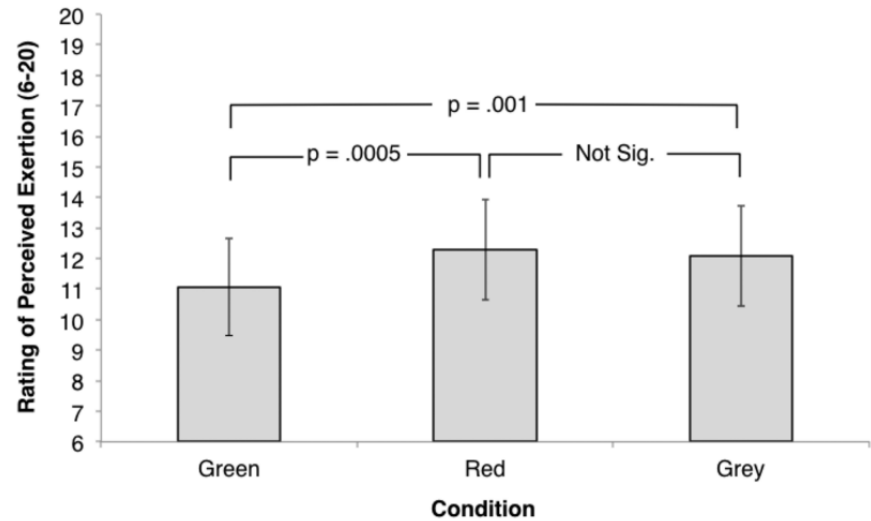
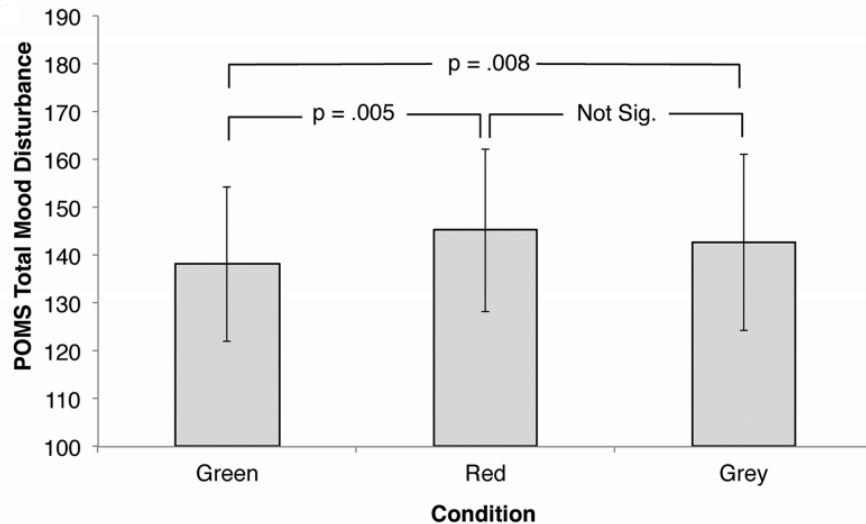
- Why?
 - Mood and perceived exertion.
 - 14 males cycled continuously for 15 minutes while watching:
 - 5 minutes of a 'green' cycle route with no filter.
 - 5 minutes of the same route with a black and white filter.
 - 5 minutes of the same route with a red filter.



Akers, A., Barton, J., Cossey, R., Gainsford, P., Griffin, M., & Micklewright, D. (2012). Visual color perception in green exercise: Positive effects on mood and perceived exertion. *Environmental science & technology*, 46(16), 8661-8666.



Green space and physical activity

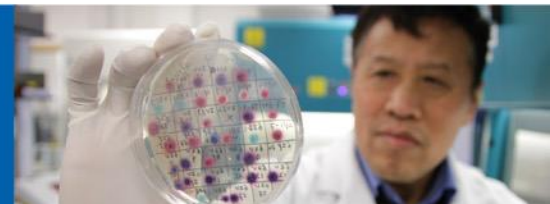


- The 'green' condition prompted less 'total mood disturbance' and lower perceived exertion (exercise felt easier).

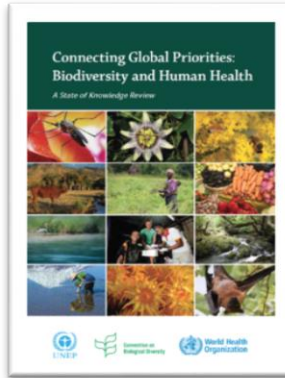
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How can we enhance and promote the health benefits of green spaces in our local areas?



Green space and health promotion



World Health Organization



Public Health England



Government Office for Science

defra

Department for Environment Food and Rural Affairs



European Centre for Environment & Human Health

ecehh.org



Green space and health promotion

- Researchers can start:
 - Using **consistent** methods and **user-centred** design.
 - E.g. Teat's Hill in Plymouth (led by Plymouth City Council) is undergoing renovations which have been entirely driven by the public and local stakeholders.
 - It is being evaluated with methods consistent with a number of studies across Europe – www.bluehealth2020.eu
 - Use **controlled** studies:
 - One review found only 12 studies of promotional physical activity interventions in urban green space with 'control' site.



Hunter, R. F., Christian, H., Veitch, J., Astell-Burt, T., Hipp, J. A., & Schipperijn, J. (2015). The impact of interventions to promote physical activity in urban green space: a systematic review and recommendations for future research. *Social Science & Medicine*, 124, 246-256.



Green space and health promotion

- We can monetise the health benefits:
 - Participants: n = 280,790 (pop. Weighted)
 - Work out % of people who achieve PA guidelines all or in part in nature.
 - Convert to QALYs.



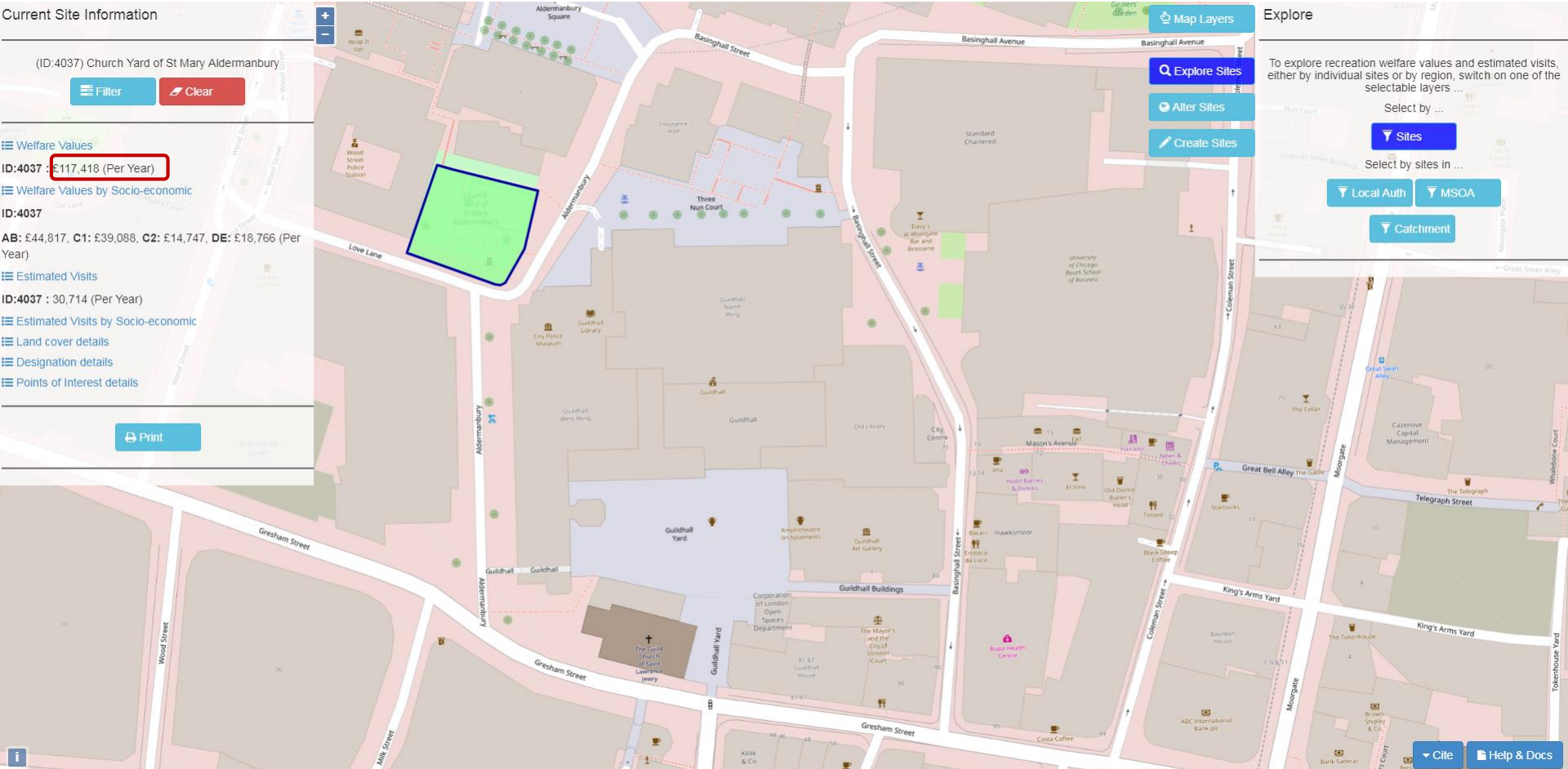
Self-reported exercise a week	Active visits last week	Number of individuals		QALYs (per year)		Annual welfare gain in £s (1 QALY = £20,000)	
		N	(Std error)	N*	(Std error)	N*	(Std error)
≥5 × 30 min	1	939,833	(11,490)	10,034	(123)	200,617,033	(2,431,401)
	2	450,500	(18,019)	9619	(385)	192,399,540	(7,695,937)
	3	251,000	(9288)	8108	(300)	162,161,060	(6,000,595)
	4	175,833	(8308)	7509	(355)	150,186,283	(7,096,447)
	5	1,007,333	(44,625)	53,775	(2382)	1,075,509,653	(47,645,863)
<5 × 30 min	5	376,833	(25,424)	20,116	(1357)	402,337,413	(27,145,704)
TOTAL		3,201,332	(75,762)	109,164	(3790)	2,183,210,983	(75,788,102)

White, M. P., Elliott, L. R., et al. (2016). Recreational physical activity in natural environments and implications for health: A population based cross-sectional study in England. *Preventive medicine*, 91, 383-388.



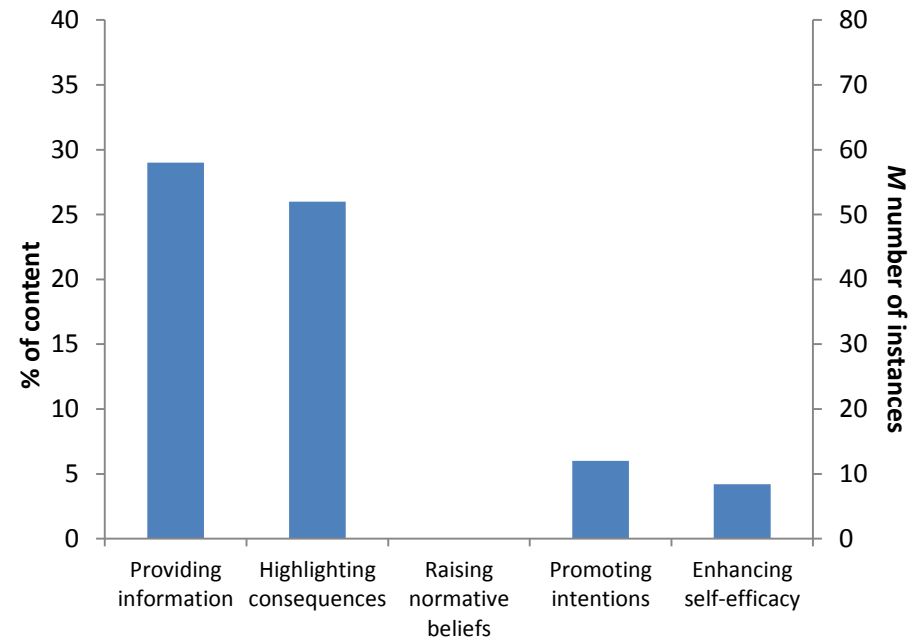
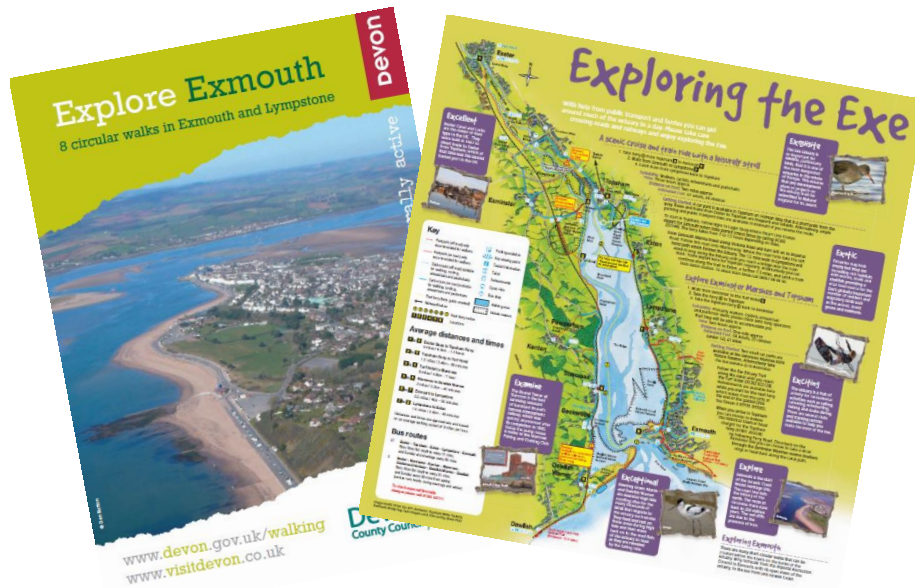
Green space and health promotion

<http://leep.exeter.ac.uk/orval/>



Green space and health promotion

- We can start speaking to the masses:



Elliott, L. R., White, M. P., Taylor, A. H., & Abraham, C. (2016). How do brochures encourage walking in natural environments in the UK? A content analysis. *Health promotion international*.



Green space and health promotion

Stage 1:

Forhampton to Wickbury

Distance: 5 miles (8 km)

Surfaces: Uneven surfaces, including fields, grassy lanes and woodland tracks. Some muddy stretches after heavy rain.
Gradients: A steep climb away from the West Forment River below Peldon Viaduct. Fairly steep descent to Wickbury. Otherwise gentle gradients.
Obstacles: A few gates. Two foot-bridges with steps.

1 The walk begins at the centre of Forhampton. When open, start by passing through a gated courtyard by the Museum of Formoor Life and Tounst Information Centre, following a path to the right hand side of the museum, through the car park onto Jacobs Pool, where you turn left. When closed, walk up George Street, to the left of the White Hart Hotel.

Follow George Street and turn right into Castle Road. Where the road bends right across the West Forment river, continue straight ahead on the path alongside the left bank of the river.

2 Pass through an iron kissing gate into the Town Park Local Nature Reserve, bearing left to climb the middle path through the woods, keeping left at two path junctions. Turn right along a surfaced bridleway shared with traffic.

3 On reaching the golf course, take the path ahead across the golf course, taking care as you proceed. After 200m, as the gravel track turns sharply to the right, continue straight ahead along the path. Leave the golf course at a metal gate, and follow the right edge of the field ahead.

Follow the 'path' signs through a metal gate and through a farmyard, to join a surfaced lane beyond the farm. When you reach the road turn left across the road bridge.



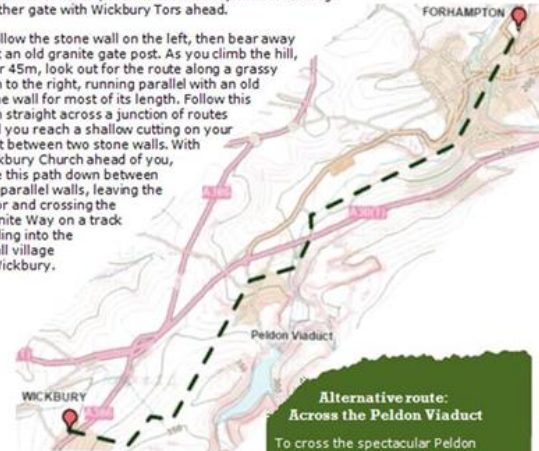
A Forhampton has a varied history including production of woollen cloth from the middle ages to the 1700s, tin and copper mining, quarrying and farming. Today, Forhampton is establishing itself as the walking centre for northern Formoor, with links to Peldon along the Formoor railway.

B Forhampton Castle was built shortly after the Norman conquest, and has stood in ruins since 1538 when Henry VIII ordered it to be demolished as a punishment for its owner's treason. Today, English Heritage open the grounds to the public over the summer months.

4 Take the path to the rear of the parking area on the right, beside the road. At a junction where a path goes to your right under the road, keep straight ahead on the path towards the river. Continue alongside the West Forment, cross the footbridge and climb the hill on the path bearing left. Pass through a gate, turn right onto a track past Peldon Farm, and turn left when you reach the road.

5 Pass under the railway bridge and continue ahead, as the road soon becomes an unsurfaced green lane. Passing through a gate, the lane widens out, then reaches the open moor through another gate with Wickbury Tors ahead.

6 Follow the stone wall on the left, then bear away past an old granite gate post. As you climb the hill, after 45m, look out for the route along a grassy path to the right, running parallel with an old stone wall for most of its length. Follow this path straight across a junction of routes until you reach a shallow cutting on your right between two stone walls. With Wickbury Church ahead of you, take this path down between two parallel walls, leaving the moor and crossing the Granite Way on a track leading into the small village of Wickbury.



Alternative route: Across the Peldon Viaduct

To cross the spectacular Peldon Viaduct, turn left after the road bridge, **4**, and opposite the parking area onto a bridleway through woods.

Follow the path straight ahead at any path junctions, walk under the viaduct and climb the steps. At the top, turn sharp left across the viaduct, and follow the Granite Way along the old railway path to a point where it crosses a road.

Turn left here to rejoin the main walk, **5**, with the route heading up the lane to the right.

Peldon Reservoir

For a scenic detour from the walk, follow the road on your left signed to Peldon Reservoir at point **5**. The reservoir was created by damming the West Forment River, and opened in 1972. From the car park and public toilets you can access a range of local walks leading around the reservoir, into the surrounding hills, or towards Peldon Viaduct.

4

5

Elliott, L. R., White, M. P., Fleming, L.E., & Abraham, C. & Taylor, A.H. (under review). "It made me want to start walking again": Redesigning outdoor walking brochures to increase recreational walking intentions. *Environment and Behavior*.



Green space and health promotion

Stage 1:

Forhampton to Wickbury

Distance: 5 miles (8 km)

Surfaces: Whatever your previous experience, this leaflet will help you tackle all the surfaces on this walk.

Gradients: There is one climb and descent. These are not too difficult especially if you shorten your stride and pace yourself – this will make it feel much easier.

Obstacles: Gates and foot bridges along the way can be used as markers of your progress along the route.

1 The walk begins at Forhampton centre. Start by passing through a gated courtyard by the museum and information centre. Follow a path to the right of the museum, through the car park onto Jacobs Pool, where you turn left. When closed, walk up George Street to the left of the White Hart Hotel. Follow George Street and turn right into Castle Road. Where the road bends across the West Forment river, continue straight on the path alongside the left bank of the river.

2 Many people like yourself love to walk this route. For some people though, walking five miles can be daunting. Using this leaflet will help you break up the route into a series of mini-walks and seem more manageable.

3 Pass through a gate into the nature reserve, bearing left to climb the middle path through the woods, keeping left at two brideways. Many people enjoy walking around this nature reserve and find it especially relaxing.

4 On reaching the golf course, take the path across the golf course, taking care as you proceed. After 200m, as the track turns sharply to the right, continue ahead along the path. Leave the golf course at a gate, and follow the right edge of the field ahead.

5 Take a rest here if you feel tired, and catch your breath if you need to. If you've come this far, you've made excellent progress – well done!

6 Follow the 'path' signs through a gate and through a farmyard, to join a surfaced lane beyond the farm. When you reach the road turn left across the road bridge.

7 Walking every day can have a variety of health benefits. Completing a walk like this will reduce your blood pressure and may help you stay more relaxed for the rest of the day. Experts say a 30 minute walk 5 days a week can sustain these benefits long-term. Lots of people walk on a daily basis and tend to feel healthier and happier.

8 Practice can build up stamina if you don't walk a lot at present. Try doing short walks near your home that you think are easy to do. Then slowly build up the difficulty of your walks until you feel confident enough to undertake longer walks like this one.

9 Take the path to the rear of the parking area beside the road. Where a path goes to your right under the road, continue ahead on the path towards the river. Continue along the river, on the path bearing left. Climbing hills can be difficult, but pace yourself and you'll find it much easier. Pass through Peldon Farm, and turn left when you reach the road.

10 Pass under the railway bridge and continue ahead; the road soon becomes a green lane. Passing through a gate, the lane widens out and then reaches the moor through another gate with Wickbury Tors ahead.

11 Follow the wall on the left, then go past a granite gate post. As you climb the hill, look out for a grassy path to the right, running parallel with a stone wall for most of its length. Follow this path across a junction of routes until you reach a shallow cutting on your right between two stone walls. With Wickbury Church ahead, take this path down between two parallel walls, leaving the moor and crossing the Granite Way on a track leading to Wickbury.

If you've reached Wickbury, you've finished the walk and you should feel very pleased with yourself.

Support From Others

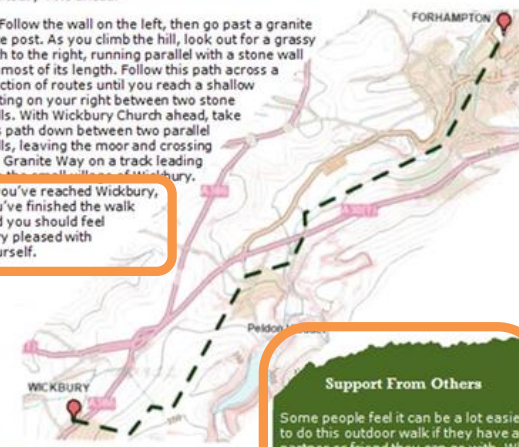
Some people feel it can be a lot easier to do this outdoor walk if they have a partner or friend they can go with. Why not try asking a friend or relative if they would like to go on this walk with you?

If you would rather, there may also be walking groups in your area that cover this route. You don't need to be a regular walker in order to join a walking group; they welcome lots of people much like yourself. Try searching on the internet for your local walking group.

You can visit <http://www.ramblers.org.uk/go-walking.aspx> and enter a postcode to find a walking group in a specific location.

Regular Walkers

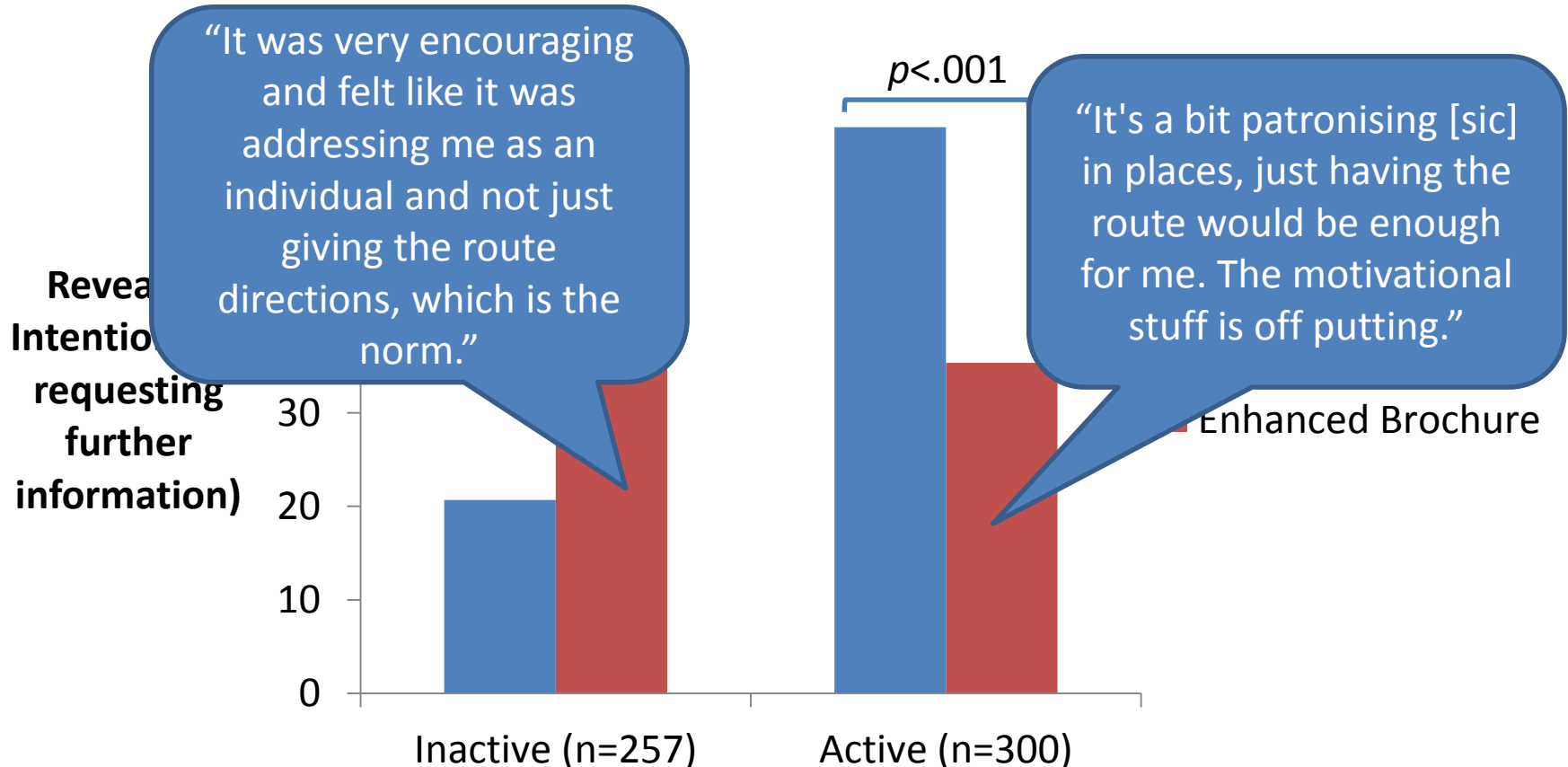
Walking is simple, free and one of the easiest ways to become healthier – all you need is a pair of shoes. It's ideal for people of all ages and fitness levels who want to be more active. Regular outdoor walkers tend to be healthy and sociable types of people. They also provide good role models for other people who want to be healthier and more active.



Elliott, L. R., White, M. P., Fleming, L.E., & Abraham, C. & Taylor, A.H. (under review). "It made me want to start walking again": Redesigning outdoor walking brochures to increase recreational walking intentions. *Environment and Behavior*.



Green space and health promotion



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Dr Mat White



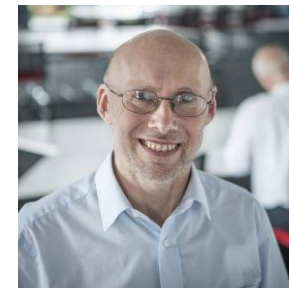
Prof Lora Fleming



Dr James Grellier



Dr Ben Wheeler



Prof Adrian Taylor



Prof Charles
Abraham

Thank you for listening

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bluehealth2020.eu

