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Environment-person interactions enabling walking in later life

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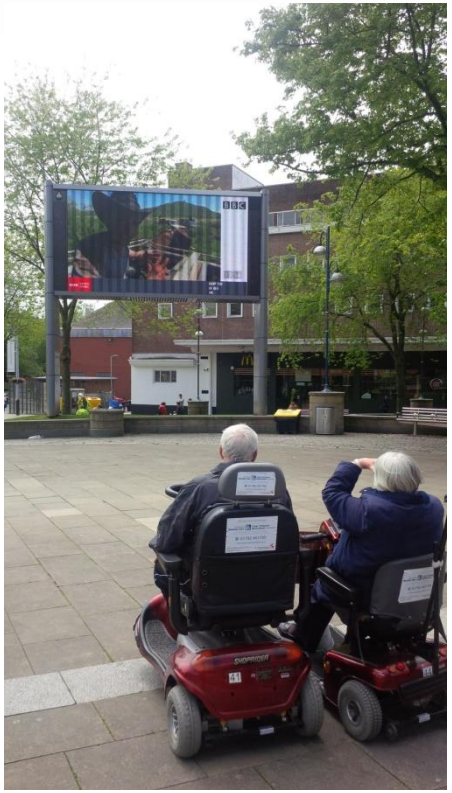


Introduction

- Maintaining mobility in later life is important for maintaining health and wellbeing.
- Active travel has direct physical health benefits,
  - regular walking or cycling can reduce cardiovascular disease by around 30%
  - reduce all-cause mortality by 20% (Hamer and Chider, 2008),
  - reduce the risk of coronary heart disease, stroke, cancer, obesity and type 2 diabetes (NICE, 2012).
  - It also keeps the musculoskeletal system healthy and promotes mental wellbeing (NICE, 2012).

- Satisfies affective motivations (e.g. independence, freedom and status; Musselwhite and Haddad, 2010).

- A lack of mobility is a significant contributing factor to societal exclusion (Pretston and Raje, 2007) and contributes to being lonely and depressed (Fonda, et al., 2001; Ling and Mannion, 1995) and results in reduced quality of life (Schlag, et al., 1996).

- So, need to keep older people actively moving.
- How we design our towns and cities have a role.

- Older people represent around 16% of the population, yet around 43% of all pedestrians killed (DfT, 2009).

- Changes in physiology: slower movements, less able to change gait, poorer eyesight, lack of confidence (esp in light of previous falls (see Dunbar et al., 2004 for review).

- Older people report issues with being a pedestrian
  - lack of time to cross the road at formal crossings,
  - cracked or uneven pavements or kerbs at formal and informal crossings,
  - poor quality paths,
  - lack of amenities (especially benches and toilets), andunattractive, unwelcoming and inapproachable spaces (see Alves et al., 2008; IDGO, 2013, Musselwhite, 2011).

- Solutions have focussed on
  - Fit person to environment:
    - Individual programmes to help older people gain confidence to use the space, help them cross the road or improve their balance or providing travel information
  - Fit environment to the person:
    - Strongly influenced by the environment with difficulties in overcoming distance and space encapsulated in concepts such as ‘environmental press ’, ‘person–environment reactivity’ (Lawton and Nahemow 1973), or environmental determinism (cf Hammond and Musselwhite, 2013)
  - Mix person-environment
    - older people possess greater agency, being more capable of selecting and mastering their environments and spaces according to their needs and preferences (Lawton 1999; Wahl and Lang 2006).

- Can we add to the debate from observations and intercept surveys?

Methodology

- 3 locations in similar region

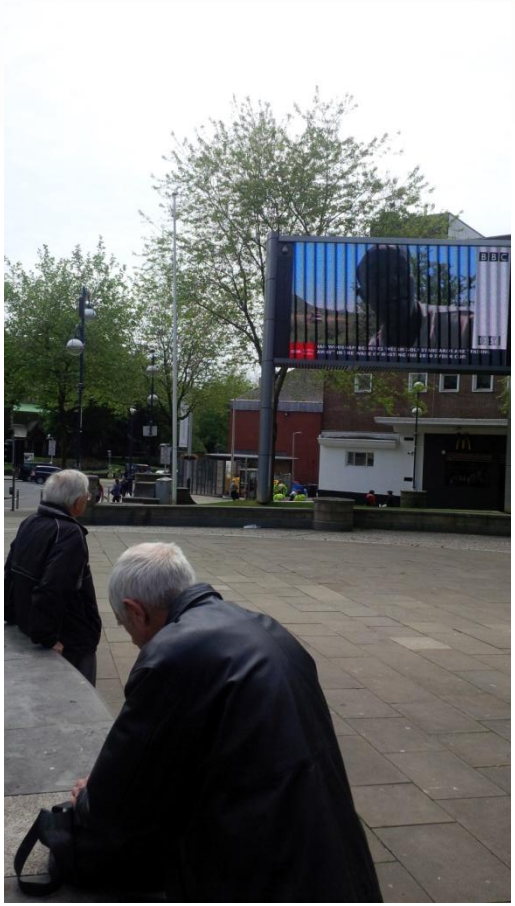
Urban shopping area
Shrewsbury

Suburban residential
The Peacock, Chester

Shared space
Castle Square, Caernarfon

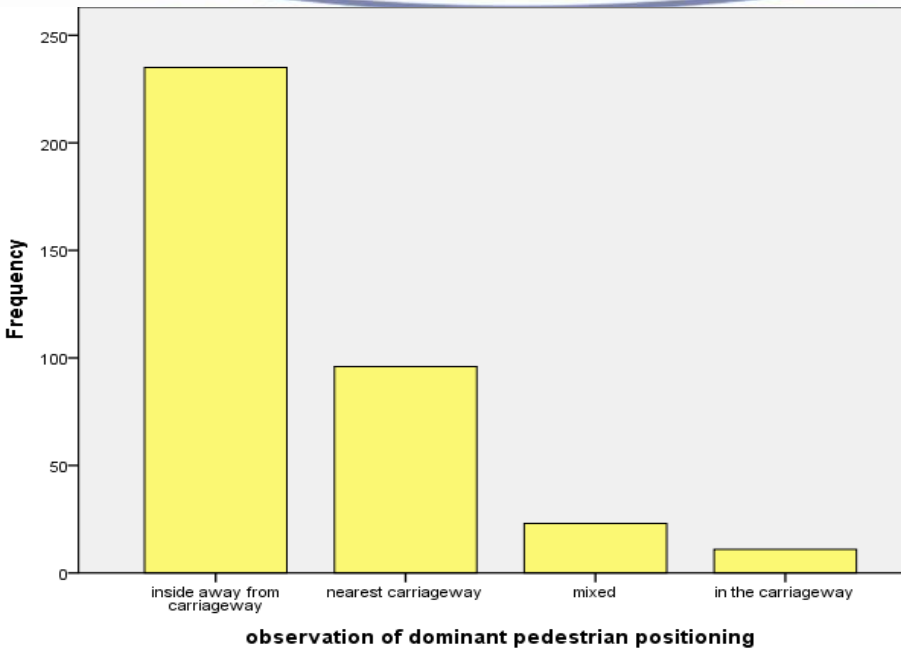
365 people observed and intercepted over 1 week at following times **(1) Location of walking; (2) Walking speed and (3) Conflict analysis**				
	8.30 and 9.30	**10.30-11.30**	**3.00-4.00**	**Total**
Urban shopping	35 (23.18%)	69 (45.7%)	47 (31.12%)	151 (41.37%)
Suburban residential	23 (23.71%)	45 (46.39%)	29 (29.9%)	97 (26.58%)
Shared space	25 (21.37%)	62 (52.99%)	30 (25.64%)	117 (32.05%)
Total	**83 (22.74%)**	**176 (48.22%)**	**106 (29.04%)**	**365 (100%)**

	Av. Age	Socio-economic status (AB=highest; DE=lowest)	Gender	Self-reported health (1=v healthy to 6=v unhealthy)	Self-reported experience (1=everyday to 6=first time visited)	Self-reported confidence (1=high to 6=low)	
Urban shopping (n=151)	70.5 (5.57)	AB=37.1% C1C2=37.1% DE=25.2%	Male=77 Female=74	1.83 (0.88)	2.58 (1.33)	2.74 (1.25)	
Suburban residential (n=97)	70.65 (5.32)	AB=25.8% C1C2=46.4% DE=27.8%	Male=46 Female=51	1.68 (0.92)	2.35 (1.25)	2.18 (1.19)	
Shared space (n=117)	70.43 (5.55)	AB=22.2% C1C2=65% DE=12.8%	Male=61 Female=56	1.98 (0.95)	2.46 (1.23)	2.65 (1.52)	
Total	**70.52 (5.49)**	**AB=29.6% C1C2=48.5% DE=21.9%**	**Male=184 Female=181**	**1.84 (0.92)**	**2.48 (1.28)**	**2.56 (1.35)**	



Findings

- Location of walking



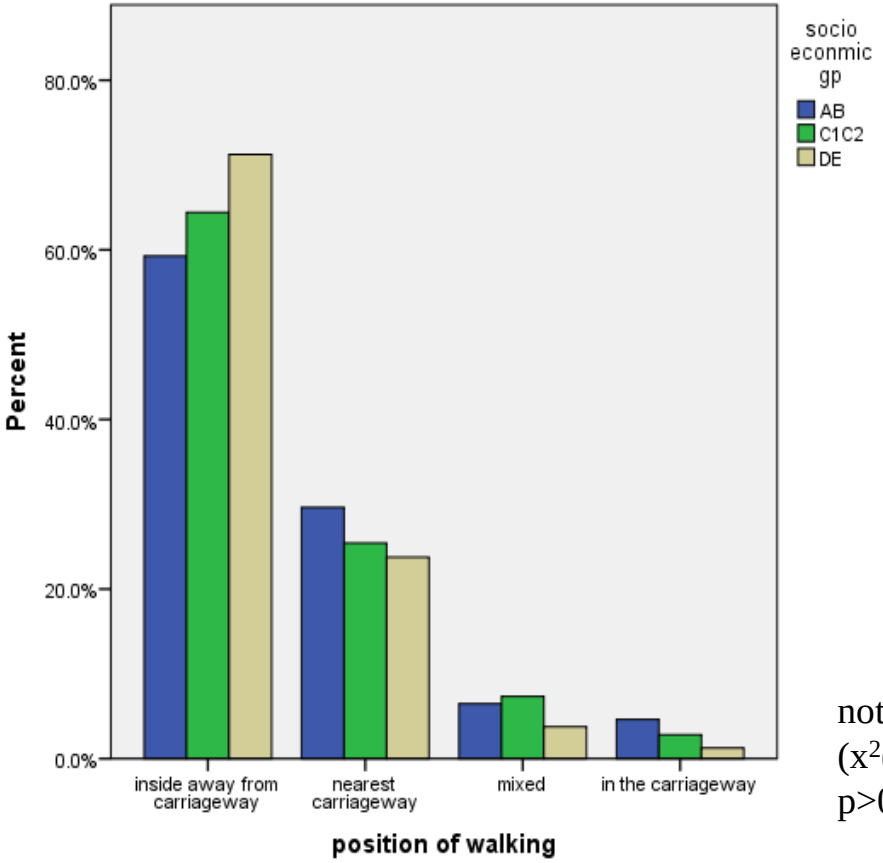
	Inside away from carriageway	Nearest carriageway	mixed	In the carriageway
Urban shopping (n=151)	9 3 (61.6%)	43 (28.5%)	15 (9.9%)	0 (0%)
Suburban residential (n=97)	58 (59.8%)	34 (35.1%)	5 (5.2%)	0 (0%)
Shared space (n=117)	84 (71.8%)	19 (16.2%)	3 (2.6%)	11 (9.4%)
Total (n=365)	235 (64.4%)	96 (26.3%)	23 (6.3%)	11 (3%)

	Inside away from carriageway (n=235)	Nearest carriageway (n=96)	Mixed (n=23)	In the carriageway (n=11)	Sig
Mean age	70.73 (5.67)	70.15 (5.62)	70 (3.93)	70.27 (2.61)	F(3,361)=0.34; p>0.05

	Inside away from carriageway (n=235)	Nearest carriageway (n=96)	Mixed (n=23)	In the carriageway (n=11)	Sig
Self-reported health	1.93 (0.9)	1.58 (0.85)	2.17 (1.15)	1.55 (0.69)	F(3,361)= 4.78; p<0.01
Self-reported experience	2.42 (1.29)	2.57 (1.29)	2.74 (1.18)	2.36 (1.03)	F(3,361)= 0.68; p>0.05
Self reported confidence	2.67 (1.42)	2.33 (1.18)	2.61 (1.16)	2.09 (1.3)	F(3,361)= 1.92; p>0.05

No age, health and experience effects on walking but there are significant differences between pedestrian positioning and self-reported health ($F(3,361)=4.78$; $p<0.01$).

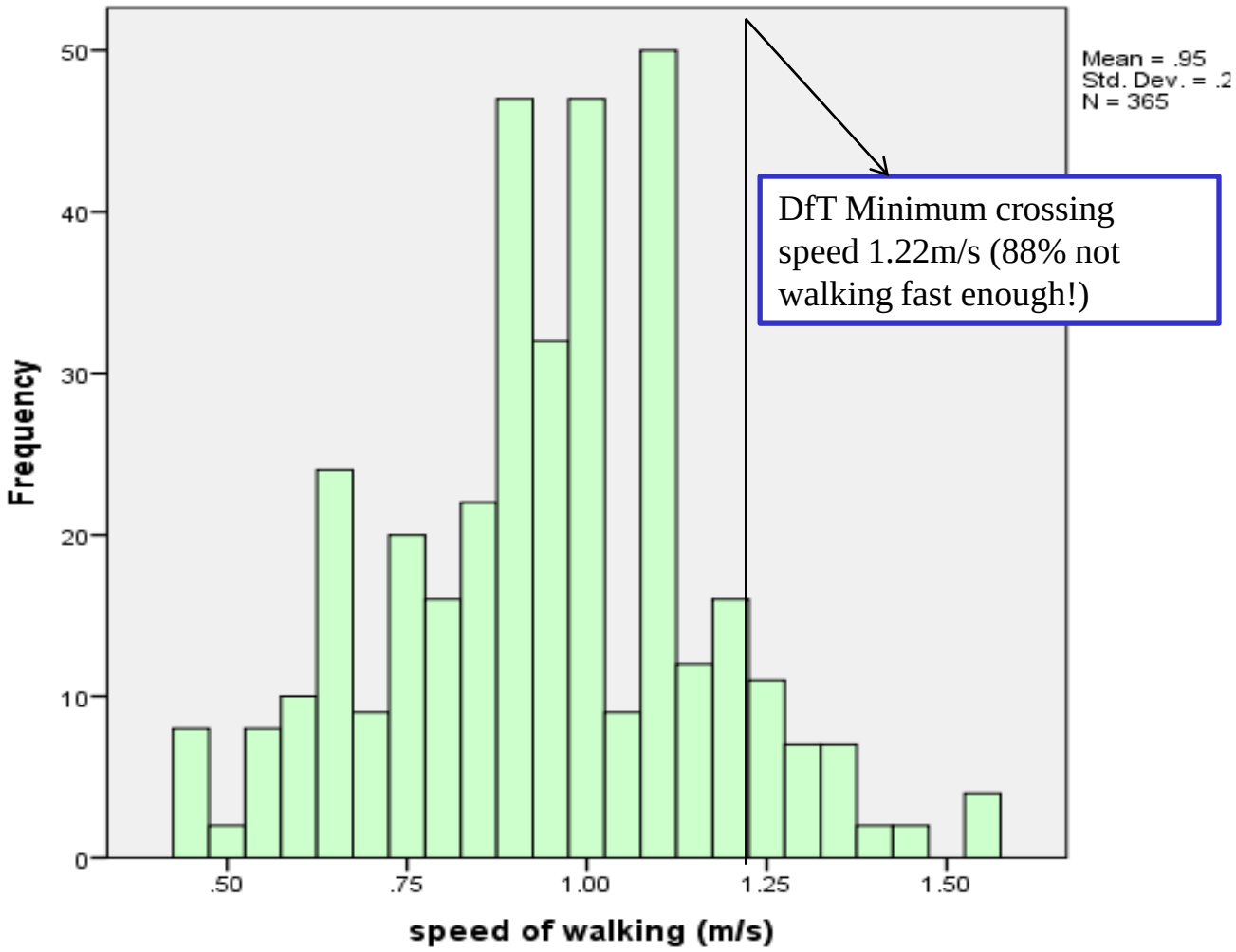
	Inside away from carriageway	Nearest carriageway	Mixed	In the carriageway
Male (n=151)	99 (53.8%)	56 (30.4%)	19 (10.3%)	10 (5.4%)
Female (n=97)	136 (75.1%)	40 (22.1%)	4 (2.2%)	1 (0.6%)
Total (n=365)	235 (64.4/%)	96 (26.3%)	23 (6.3%)	11 (3%)



Males are significantly more likely to walk nearer the carriageway, vary their walk between inside and near the carriageway and walk in the carriageway (in shared space areas), females are more likely to walk furthest away from the carriageway $x^2(2, N=3)=25.62$; $p<0.01$

not significant ($x^2(2, N=6)=4.65$; $p>0.05$).

(2) Speed of walking



Males (mean=1m/s; sd=0.21) wal sig faster than females (mean=0.89m/s; sd=0.21) ($t(363)=5.33;p<0.01$).

Those from higher AB SES walk fastest on average (mean=1; sd=0.21) followed by those from C1C2 (mean=0.94; sd=0.22) then DE (mean=0.9; sd=0.2). This is a significant difference ($F(362,2)=5.38;p<0.01$)

Speed of walking is correlated to self-reported health ($r(365)=0.28$; $p<0.01$) and confidence ($r(365)=-0.18$; $p<0.01$), though not to experience of using the area ($r(365)=-0.47;p>0.05$).

Those inside walk sig slower (0.92m/s) than those nearest (1m/s) or in the carriageway (1.1m/2) $F(3,361)=5.35$; $p<0.01$

(3) Conflict analysis (change direction)

- 27 ped-ped conflicts

		conflict with pedestrians		Total
		yield	did not yield	
Gender	male	6	7	13
	female	9	5	14
Total		15	12	27

No significant differences between gender and yielding ($x^2(1, N=27)=0.898$; $p>0.05$).

		conflict with pedestrians		Total
		yield	did not yield	
Location	Urban shopping	9	4	13
	Suburban residential	2	1	3
	Shared space	4	7	11
Total		15	12	27

No significant differences between location and whether people yield or not.

	Conflict with other pedestrians				
	Inside away from carriageway (n=235)	Nearest carriageway (n=96)	Mixed (n=23)	In the carriageway (n=11)	total
Did not yield	8	3	3	1	15
Yield	4	3	3	2	12
Total	12	6	6	3	27

No statistical significance between where someone walks and whether or not they yield to other pedestrians ($x^2(2, N=3)=1.35$; $p>0.05$)

(3) Conflict analysis (continued)

- 27 ped-ped conflicts

		conflict with other pedestrians		Total
		yielded	did not yield	
socio economic group	AB	1	10	11
	C1C2	6	2	8
	DE	8	0	8
Total		15	12	27

Class effects whether someone yield in a conflict situation. AB sig less likely to yield than C1C2 and DE ($x^2(2, N=27)=17.243$; $p<0.01$)

	Conflict with other pedestrians		
	Yielded (n=15)	Did not yield (n=12)	Sig difference
Self-reported health	2.2 (0.94)	1.75 (0.62)	t(24)=1.49; p>0.05
Self-reported experience	2.67 (1.29)	2.75 (1.06)	t(25)=0.19; p>0.05
Self reported confidence	3.07 (1.01)	1.75 (1.22)	t(23)=2.92; p<0.01

Confidence effects whether someone yields in a conflict situation. Those with higher confidence significantly more likely not to yield. (t(23)=2.92; p<0.01).

Also, there was no sig relationship between walking speed and whether individuals yielded or not in conflict with other pedestrians (t(23)=0.43; p>0.05).

Conclusion

- **Majority of time walk away from carriageway**
  - Continue to do so in shared space areas
  - Those that walk in carriageway are almost exclusively male (agreeing with previous research e.g. Moody, 2011 and Kaparias, 2010)
  - Males more likely than females to walk nearest the carriageway (Urban areas are masculine allowing men to master and dominate the space, Weismann, 1994).
  - Healthy people dominate the space too.

- **Only 11% walk as fast or faster than DfT recommendations for pedestrian crossing time**
  - Only 6% of females
  - Faster if higher socio-economic background, healthy and confident
  - Agrees with previous research (Asher et al., 2012, Newton and Omerod, 2007).
  - fear of not being quick enough to cross the road is known to restrict people leaving the home or limit their accessibility when out and about (IDGO 2013; Lord et al., 2010; Zijlstra, 2007).
  - Fast not always best: Shared space slowest speeds (more attractive?)

- **Conflicts: No more yielding than yielded**
  - Less likely to yield in shared space (others have more space to move?)
  - More confident and higher socio-economic backgrounds are less likely to yield

Background of the person effects behaviour in urban space

- Domination of space by male, higher confidence, better health and higher socio-economic background.
- Submissive use of space by females, lower confidence, poorer health and lower socio-economic background

Space itself dictates behaviour

- type of location also affects individuals; older people are less likely to yield in shared space, walk faster in urban areas, slower in shared space areas and walk closer to the carriageway in suburban areas and in the carriageway in shared space areas

- Need to accommodate different walking speeds
  - Need to change 1.2m/s as default walking speed for crossings
- Awareness of masculinity of urban/suburban spaces
- Awareness of potential exclusion by socio-economic background
- Affording wider use of all of the pavements by design
- Encouraging involvement in design from a variety of older people from different backgrounds is essential.

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