Associations of mode of travel with physical activity, and individual, interpersonal, organisational and environmental characteristics

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Workplaces and participants

87 workplaces
• Urban areas of south-west England and south Wales
• Two recruitment phases (May-July 2015 and March-May 2016)
• Diverse workplaces: public administration, professional and scientific organisations, retail, services and manufacturing
• 45 small (< 50 employees); 22 medium (50-250); 20 large (250+)

Baseline data from 654 employees
• 66% participants younger than 35 years
• 66% had household income greater than £30,000
• 57% females
• 58% educated to degree level
Data collection: physical activity

Participating employees asked to:

• Wear an accelerometer (Actigraph GT3X+) for 7 days during waking hours
• Wear a personal GPS receiver (QStarz BT1000XT) during their commute
• Complete a 7-day travel diary
• Complete questionnaire: sociodemographic characteristics, travel behaviour, workplace characteristics, perceptions of the commute
Data analysis

- Participants required to provide:
  - at least 3 days (of at least 600 minutes) accelerometer data
  - at least one valid day of accGPS data on a working day
- Accelerometer and GPS data combined for every 10 second epoch (accGPS)
- Sedentary time and MVPA defined using validated thresholds: sedentary <100 counts per minute (cpm); MVPA ≥ 1952 cpm
- Physical activity during commute by mode of travel
  Multivariable logistic regression models to identify factors associated mode of travel to work
<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>Car</th>
<th>Walks</th>
<th>Public transport</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n=540</td>
<td>n=357</td>
<td>n=62</td>
<td>n=62</td>
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<tr>
<td>n (%)</td>
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<tr>
<td>Meets public health physical activity guidelines*</td>
<td>60 (11.1)</td>
<td>17 (4.8)</td>
<td>24 (38.7)</td>
<td>10 (16.1)</td>
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<tr>
<td>Mean (SD)</td>
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<tr>
<td></td>
<td>n=597</td>
<td>n=404</td>
<td>n=71</td>
<td>n=73</td>
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<tr>
<td>Mean daily time spent in MVPA during commute (minutes)</td>
<td>13.0 (14.3)</td>
<td>7.3 (7.6)</td>
<td>34.3 (18.6)</td>
<td>25.7 (14.0)</td>
</tr>
</tbody>
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SD: Standard Deviation; MVPA: Moderate to Vigorous Physical Activity

* Recommended physical activity for adults in 150 minutes accumulated throughout the week in bouts of at least 10 minutes
Positively associated with walking to work

- No access to a car (p<0.001)
- Commuting distance <2km (p<0.001)
- Commuting distance 2-4km (p<0.001)
- No free car parking at work (p<0.01)
Positively associated with using public transport

- Shorter commuting distance ($p<0.001$)
- No access to car ($p<0.001$)
- No free parking at work ($p<0.01$)
- Aged <35 years old ($p=0.04$)
- More positive perceptions of the environment ($p=0.01$)
- Not combining the commute with school run or caring responsibilities ($p=0.03$)
<table>
<thead>
<tr>
<th>Top 3 reasons for car use during commute</th>
<th>Single most important reason for car use during commute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quicker than alternatives (n=329, 78.0%)</td>
<td>Quicker than alternatives (n=100, 28.7%)</td>
</tr>
<tr>
<td>Reliability (275, 65.2%)</td>
<td>Lack of alternatives (51, 14.7%)</td>
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<tr>
<td>Comfort (275, 65.2%)</td>
<td>Reliability (39, 11.2%)</td>
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Physical activity and commuting

• Objectively confirms low levels of physical activity in a UK adult working population
• Strong associations of physical activity with walking and public transport as main modes of travel to work
Importance of distance

- Walking associated with shorter distances
- New developments should include both homes and workplaces
- Existing towns and cities should support opportunities for local employment
Importance of transport planning

- Majority of participants had commute distance >2km (n=555, 84.8%): walking as main mode of travel to work not feasible?
- Main reasons given for car use: “quicker than alternatives” and “reliability”
- Behavioural interventions must be supported by transport and planning policies
- Workplace subsidies for public transport?
Workplace parking

• Walking to work and use of public transport both associated with lack of free parking
• Removal of parking unpopular with employees: employers prefer this to be imposed from outside the workplace e.g. ‘head office’ or local/national government
• Evaluation of workplace policies to limit or charge for workplace car parking: evidence for practitioners and policy-makers.
Batista Ferrer H, Cooper A, Audrey S. Associations of mode of travel to work with physical activity, and individual, interpersonal, organisational, and environmental characteristics. *Journal of Transport and Health*, 2018: Available online.