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Title The longevity of behaviour change: A case study of the London 2012 Olympic and Paralympic Games

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Abstract This paper presents the results of a longitudinal study of travel behaviour change before, during and after the London 2012 Olympic and Paralympic Games. The Games presented a huge transport problem for the organisers, with a vast influx of additional visitors to the city adding significant pressures to a network already at capacity. A major behavioural change programme was instigated with businesses and a significant public outreach campaign was put in place. Through the lens of the Transtheoretical Model (TTM), the authors examine whether travel behaviour changed during the Games, and whether this was sustained in the long-term once the Games had ended and what factors explain these changes. The TTM has previously been used as the basis for designing travel behaviour change initiatives. This study is theoretically novel however as there are no studies which show whether the TTM can explain change under a scenario where there is an imperative to change and a broader social context of change and adaptation. There are also very few longitudinal panel studies of behaviour change which again provide the opportunity for novel insights.

The data presented in this research is derived from a four-wave longitudinal panel study conducted in partnership with Transport for London (TfL) between July 2012 and March 2014. The first three waves were commissioned by TfL and conducted by AECOM between July and December 2012. The purpose of these was to examine the before, during and after situation around the commuter response to the Games. The authors contributed to the study through the design of certain questions and providing comments on the overall design of the surveys. These surveys captured an extensive amount of data that includes a detailed description of the commute journeys of the sample before, during and after the Games to illustrate whether changes occurred. They also gathered data (through the TTM) that provided an examination of the psychological motivations underpinning the behaviour observed.

The fourth wave of the panel study was developed by the authors with contribution from TfL. This survey was conducted between February and March 2014 and was distributed to the same participants of the previous three waves. The survey followed a similar format to the previous three waves, although was shorter in length owing to it being a follow-up survey. This survey was conducted to capture the longer-term situation to understand how individuals in the sample were now travelling compared to during the Games. The fourth wave of the survey also included questions to examine how the sample responded to the London Underground workers strike that took place at the beginning of February 2014.

The findings from the data collection indicated that during the Games, 55% of individuals in the sample made at least one change to their commute journey. Changing mode, route, departure/arrival time and reducing journeys were the four types of behaviour change explored. Prior to the Games, almost 70% of

individuals in the sample stated that they were not currently considering changing their usual commute journey (not associated with changing for the Games). These individuals were found to be significantly less likely to make a change during the Games, compared to those who had indicated more preparedness to change. However, individuals in all forms of preparedness to change displayed some ability, and flexibility, to make changes to their behaviour when faced with a large-scale disruption such as the Olympics. Statistical tests suggest that self-efficacy differed across the four types of change examined. For example, the individuals that re-moded were significantly more likely to regard changing mode as easier in comparison to those that did not re-mode. For those who reduced the number of journeys they made, 'finishing work earlier' was found to be significantly easier. A cluster analysis of the processes of change and self-efficacy constructs of the TTM provided four clusters. It was found that these did not link to the stages of change as explicitly as the theory indicates they should.

This research is particularly interested in how changes persist. After the Games had ended, some of the changes that were made during this period continued to be sustained. The evidence indicated that 6% of London commuters sustained a change that they made, which includes reducing, re-moding, re-routing and retiming journeys. During the Games there was an increase in the number of people working from home at least one day per week. 26% of the sample reported working from home at least one day per week during the Games, an increase of 13%. Once the Games had ended this figure decreased to 20%, however this still indicates a 7% increase on the pre-Games numbers. Owing to the overlap in the end of the wave four survey and the submission of this abstract, the authors have not been able to include the findings from the fourth survey wave. These will however be available for presentation at the conference in September.

The findings suggest that the TTM has limitations in helping explain behaviour change in this context. This, we suggest is because of the short-term nature of the disruption that was studied. It is true that those people exhibiting preparatory behaviours were more able to make more changes and to use different transport options but they were not the only ones to change.