

# Using people's feelings to value time

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## About the authors

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## About the paper

This short summary introduces the main idea in Krekel and MacKerron's paper proposing an alternative method to estimate the value of time (VOT): *experiential valuation* based on experience-sampling. The paper is available at:

[https://cep.lse.ac.uk/\\_NEW/publications/abstract.asp?index=10288](https://cep.lse.ac.uk/_NEW/publications/abstract.asp?index=10288)

## About the What Works Centre for Wellbeing

We are an independent collaborating centre, and the aim of our work is to improve wellbeing and reduce misery in the UK. We believe that this is the ultimate goal of effective policy and community action. By accelerating research and democratising access to wellbeing evidence, we develop and share robust evidence for governments, businesses, communities, and people to improve wellbeing across the UK.

# Introduction

How people spend their time largely determines their overall quality of life,<sup>1</sup> and in particular, how happy they are on a moment-to-moment basis.<sup>2</sup>

If markets provide insufficient means for people to optimally allocate their time, there is a rationale for policy intervention, for example, by investing into time-saving infrastructure such as faster roads or trains. But how should we value time and associated time savings, key inputs into cost-benefit analyses of such projects?

Traditionally, intangibles like time have been valued using either stated or revealed preferences. Here, people are either directly asked how much they would be willing to pay for, for example, a hypothetical reduction in travel time due to a faster road or train,<sup>3</sup> or their willingness-to-pay is revealed from observing their behaviour, for example road choices with different travel times and tolls<sup>4</sup> or ride shares with different waiting times and prices.<sup>5</sup>

While revealed preferences are typically seen as the gold standard to value intangibles, including time, they also have well-known problems, such as heuristics and biases arising from choice architecture and that people make large, systematic errors when predicting the welfare consequences of different choices.<sup>6</sup> Most importantly, what exactly constitutes a particular use of time is entirely subjective. For example, having a good conversation with a loved one while being stuck in traffic during a commute may be perceived very differently than being stuck alone, or as not being stuck at all. What matters is the context in which an activity is experienced, in line with subjective time perception.<sup>7</sup>

## An alternative method for valuing time

In our new paper<sup>8</sup>, we propose an alternative method to estimate the value of time (VOT): *experiential valuation* based on experience-sampling. Our method does not rely on how people *think* what the welfare consequences of different choices will be but, instead, relies on how they actually *feel* once they have made their choices. Crucially, it allows them to judge for themselves what constitutes a particular use of their time and how they feel about it.

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<sup>1</sup> Smeets et al., 2019; Sharif et al., 2021.

<sup>2</sup> Kahneman et al., 2004; White and Dolan, 2009; Bryson and MacKerron, 2017.

<sup>3</sup> cf. Calfee and Winston, 1998.

<sup>4</sup> cf. Fezzi et al., 2014.

<sup>5</sup> cf. Buchholz et al., 2020.

<sup>6</sup> Wilson and Gilbert, 2003; Odermatt and Stutzer, 2019.

<sup>7</sup> cf. Bradford et al., 2019.

<sup>8</sup> Krekel and MacKerron, 2023.

We are the first to exploit people’s hedonic experiences in real-time to value time (or indeed any intangible). However, the idea is rather old, going back to the early economist Francis Y. Edgeworth (1845-1926), who argued that a *hedonimeter* would, at some point in the future, make it possible for economists to directly measure utility on a physiological basis.

Less ambitious, our *hedonimeter light* is a smartphone app that during the years 2010 to 2017 randomly asked a panel of 30,936 UK residents (N=2,235,733) about their momentary feelings and activities as they went about their daily lives.

We use these rich panel data to estimate the value of time (VOT) for 42 daily activities. Our method has three steps:

1. We first estimate the effect of each activity and income on respondents’ happiness.
2. Then, we calculate the marginal rate of substitution between each activity and income to obtain the monetary equivalent of each activity, standardising it to 60 minutes.
3. Finally, we obtain the VOT for each activity by subtracting from the monetary equivalent of that activity the weighted average of the monetary equivalents of all the other activities (i.e. the counterfactual).

## Key findings

Table 1 shows the VOT for selected activities (for the complete list of all 42 daily activities, see Table 2 in Krekel and MacKerron, 2023).

<b>Table 1: Value of Time (VOT) (£, 60 Minutes) for Selected Activities</b>	
<b>Activity</b>	<b>VOT (rounded)</b>
Waiting, Queueing	£ -12.20
Waiting, Queueing during Commuting, Travelling	£ -17.20
Sports, Running, Exercise	£ 11.70
Theatre, Dance, Concert	£ 11.20
Exhibition, Museum, Library	£ 8.10
Working, Studying	£ -8.40
Commuting, Travelling	£ -8.40
Care of Help for Adults	£ -12.60

We find that, on average, spending 60 minutes in *waiting or queueing* rather than doing something else is worth £-12.20. The negative sign suggests that there is an opportunity cost to waiting: people may be better off (in terms of their momentary happiness) spending their time doing something else. This estimate can be used as a go-to benefit in cost-benefit analyses of broadly defined projects that reduce waiting time *in general*.

Spending 60 minutes in *waiting or queueing* during *commuting or travelling* is worth £ -17.20. That is, a person who is stuck in traffic would need to be compensated £ 17.20 to achieve the same happiness level as a person who is not. This estimate can be used in cost-benefit analyses of infrastructure projects that aim at reductions in waiting time during commuting. It resembles estimates from studies using revealed preferences, suggesting that using hedonic experiences (monetary happiness) leads to similar insights as observed behaviour. There is thus a closeness between how people behave and how they feel.

When it comes to culture and sport, these activities have a relative benefit. Spending 60 minutes in *sports, running, exercise* rather than doing something else is worth £ 11.70; 60 minutes in *theatre, dance, concert* £ 11.20; and 60 minutes in *exhibition, museum, library* £ 8.10.

As to work, 60 minutes in *working or studying or commuting or travelling* is each worth £ -8.40. Spending one hour to provide *care or help for adults* is £ -12.60. Again, the negative sign suggests an opportunity cost to these activities, in that people may be better off in terms of their hedonic experiences doing other things.

## Implications and uses

The UK Treasury's 2021 Wellbeing Guidance for Appraisal: Supplementary Green Book Guidance<sup>9</sup> is the official guideline for wellbeing policy appraisal and evaluation in the UK. It enables analysts to use accounts of self-reported life satisfaction as measures of benefit. In particular, it allows using Wellbeing-Adjusted Life Years or WELLBYs, defined as one point of life satisfaction on a zero-to-ten scale for one individual for one year.<sup>10</sup> WELLBYs offer a way to consistently measure and value improvements in wellbeing across a wide range of policies.

Our method shows how people's hedonic experiences in real-time can be used as a complement, specifically for activities – such as sport or theatre or museum visits – that are too granular to be captured by global, evaluative measures of wellbeing but are nevertheless important in policy appraisals in certain departments or agencies, like the Department for Digital, Culture, Media and Sport, Sport England, and Historic England.

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<sup>9</sup> HM Treasury, 2021a, 2021b.

<sup>10</sup> Frijters et al., 2020; Frijters and Krekel, 2021.

One could think of an equivalent, experiential measure to the WELLBY: a *Wellbeing-Adjusted Life Hour* or *WELLBH*. This could be defined as one point of self-reported happiness in real-time on a zero-to-ten scale for one individual for one hour. In our paper (Krekel and MacKerron, 2023), we show that a possible seed value could be £ 20 (i.e. the marginal rate of substitution between one point of happiness and income, standardised to one hour). The WELLBH could then be used to value time spent in one particular activity relative to all the other activities a person could be doing as a counterfactual, as shown in our paper.

Yet, more work needs to be done to make evaluative and experiential measures of wellbeing more compatible with each other – a promising avenue for future research.

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