CRC for
Water Sensitive Cities

The real problem of hypothetical bias in the valuation of stormwater management projects

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Stated preference methods provide an important means of assigning monetary values to non-market goods and services but they suffer from a significant problem: hypothetical bias. That is, people's tendency to overstate their willingness to pay in hypothetical scenarios. However, a recent study into the valuation of stormwater management projects found that the saliency approach – a novel method that links financial incentives to respondents' survey choices – is an effective means of minimising hypothetical bias and eliciting more truthful preferences.

Stated preference methods are widely used to value non-market goods and services, such as environmental features and new products, for which market data are unavailable. These methods involve analysing how survey respondents make trade-offs between costs and benefits in hypothetical scenarios in order to infer their willingness to pay for those benefits. However, while stated preference methods are very useful, they have a significant Achilles heel: people tend to overstate their willingness to pay in hypothetical settings.

Hypothetical bias and the saliency approach

The divergence between what people say in response to surveys and how they act in real transactions is known as **hypothetical bias**. Most importantly for policymakers, the extent of hypothetical bias can be substantial.

People typically overstate their willingness to pay by a factor of up to two to three, resulting in inflated estimates of monetary values, biased outcomes in cost-benefit analyses and potentially the implementation of suboptimal policy recommendations.

As such, the problem of hypothetical bias is among the main reasons why willingness to pay numbers from stated methods are often rejected by practitioners.

In an endeavor to reduce the impact of hypothetical bias and improve the accuracy of the data elicited through stated preference methods, researchers in the CRC for Water Sensitive Cities (CRCWSC) developed an innovative methodology called the **saliency approach**. It involves attaching financial incentives (i.e. real monetary earnings) to respondents' survey choices so as to increase the saliency of the cost of their decisions. In this way, it asks respondents to put their money where their mouth is.

Testing for hypothetical bias and the saliency approach

To test the extent of hypothetical bias and the effectiveness of the saliency approach, the CRCWSC conducted a discrete choice experiment examining individuals' willingness to pay for the benefits associated with water management policies in their local community.

The study involved a door-to-door survey of 981 homeowners in Melbourne and Sydney in 2013. Respondents were asked to choose between the status quo and two water management alternatives that offered improvements to environmental amenities at an additional cost.

A subset of the respondents (the salient treatment group) received a cash endowment prior to participating in the choice task and was told that, at the end of the experiment, one of their choices would be randomly selected and the cost associated with that choice deducted from their experimental earnings. This money would then be used in a local water management project.

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The remainder of the respondents (the control group) participated in a non-incentivised version of the choice task.

The extent of hypothetical bias and the efficacy of the saliency approach

Table 1 summarises the key findings from the study. In particular, it found strong evidence of hypothetical bias and support for the saliency approach, which reduced the extent of hypothetical bias and improved the accuracy of the preferences elicited through the discrete choice experiment.

Table 1. Key findings from the study of Brent et al. (2016)

Key findings	
Strong evidence of hypothetical bias	• Average hypothetical bias of 61%
Saliency approach reduces hypothetical bias	• Respondents were more sensitive to cost and contributed less when faced with direct financial incentives • Treatment group chose projects that cost A$0.63 less than the control group (around 5% of the average cost) • Marginal utility of income was 85% higher for the treated sample than the control.
Low income respondents and women most affected by hypothetical bias	• Treated low income respondents chose alternatives costing $1.74 less than low income respondents in the control • Treated women chose alternatives costing A$1.49 less than women in the control
Some respondents unaffected	• Treated respondents who engage in nature and have children did not reduce their willingness to pay • This is consistent with the fact these respondents have stronger preferences for water management

Lessons for policymakers

Stated preference methods provide valuable insight into the community's willingness to pay for goods and services for which information about monetary values is unavailable. However hypothetical bias can result inaccurate willingness to pay estimates and eventually result in skewed policy design. Therefore, findings from those studies should be used with care.

The saliency approach can be employed as a means of reducing the impact of hypothetical bias and gaining more accurate insight into the community's willingness to pay. This can increase the acceptance of the monetary values generated from stated preference methods and potentially lead to more efficient allocation of public funds.

About the research

This research was conducted as part of the CRCWSC project Cities as Water Supply Catchments: Economic Valuation (Project A1.1). The project's main objectives are to identify the willingness to pay for stormwater harvesting, to quantify the contribution of urban water amenities to property values and to determine the optimal portfolio of urban water supply sources.

Further reading

Brent, Daniel A., Gangadharan, Lata, Leroux, Anke and Raschky, Paul A. (2016) Putting Your Money Where Your Mouth Is. Monash University Department of Economics Working Paper Series.

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https://www.watersensitivecities.org.au/content/project-a1-1/

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