Discrete Choice Experiment (DCE) Vs Technical Threshold (TT) Analyses: How to Choose?

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INTRODUCTION

Patient preference is becoming increasingly important in health technology assessments (HTA) and healthcare decision-making, requiring robust elicitation methods to capture patient perspectives. Two prominent methods for this are the **Discrete Choice Experiment** (DCE) and the **Threshold Technique** (TT). DCE varies treatment characteristics across questions, assessing multiple attributes, while TT keeps characteristics constant, focusing on a single attribute (Figure 1). Despite their widespread use, clear guidance is lacking on selecting the optimal method based on clinical context, patient population, and study requirements.

Figure 1: Key difference between DCE and TT design

Reference			Target		
Risk of AE: 5%			Risk of AE: 10%		
Efficacy: 10%			Efficacy: 20%		
DCE. Attribute la	avels vary across		TT. Repeat question with variation		



When reviewing studies that quantitatively assessed DCE and TT, some distinctions emerged (Table 1): DCE effectively handles both numeric and non-numeric attributes while TT focused on numeric ones. Additionally, DCE accommodated multiple attributes and levels within complex designs while TT repeated the threshold series to assess multiple attributes. DCE studies generally assessed 5-6 attributes with 2-5 levels, employing orthogonal or D-efficient designs with 16-60 questions. TT, with its simpler configuration, is particularly



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questions based on an experimental design



only one attribute until a shift in patient preference is observed

OBJECTIVES

This study aims to identify **practical criteria** for choosing between DCE and TT methodologies based on their distinct designs, sample size requirements, cognitive burden, and outcomes. The goal is to explore the current applications and guidelines to optimize their use in HTA and clinical decision-making processes.

METHODS

- PubMed database was searched from inception to September 2024 to identify the studies that applied the use of TT alone or those that used both TT and DCE methodologies in the healthcare settings.
- In addition to these empirical studies, qualitative studies that involved expert panels were reviewed to establish and assess selection criteria for TT or DCE in the context of HTA submission.
- Data on sample size, survey length, number of attributes, and statistical models and key results reported in the included studies were included.
- Additionally, the statistical models applied in the included studies were explored to understand the key outputs and trade-offs identified by each method.

suited for studies with fewer attributes or smaller samples.

Table 1: TLR results on the differences between DCE and TT

Method	Survey duration	Sample size	Total number of attributes	Total number of assessed attribute		
TT	7 to 60 minutes [†]	18 to 2740	2 to 9	1 to 7		
DCE*	Not reported [‡]	172 to 3500	5 to 6	Not applicable		
 Review based on studies that conducted both quantitative TT and DCE Longer times often due to the length of educational materials Except for Veldwijk 2023 that report 30 minutes for both methods Expert insights from qualitative studies (Table 2) provide guidance on choosing between TT and DCE. DCE is recommended for complex studies with multiple attributes and trade-offs, effectively capturing patient preferences. It is recommended to limit choice tasks to 8-16, with 6-7 attributes per task and 2-4 levels per attribute, due to varying treatment profiles across tasks.⁶ TT, however, is ideal for simpler studies focused on key attributes, offering efficiency and reduced cognitive load, especially for smaller sample sizes. In practice, DCE manages complex scenarios with varying treatment characteristics across all questions, while TT is best for simpler, fixed-characteristic scenarios to evaluate 						

RESULTS

A total of 256 publications were identified and after screening, 39 studies were extracted and analyzed (Figure 2).

Figure 2: Identification and screening process



Table 2: Suggested criteria to choose between DCE and TT

Criteria	DCE	TT	
Sample size	> 100	< 100	
disease indication	Not ideal for those with cognitive dysfunction*	Most disease indication	
Measure the interaction between attributes	Allowed	Not allowed	
Complexity	Higher [†]	Lower [‡]	
 * High cognitive burden d † Requires complex experi treatment characteristics ‡ Does not require an experi treatments remain fixed, e 	ue to multiple decision tasks mental designs (e.g., orthog vary between choices erimental design; the levels except for the attribute of in	s gonal, efficient) where of reference and target terest	

CONCLUSIONS

In conclusion, this TLR highlights the distinct yet complementary roles of TT and DCE in healthcare decision-making. TT's streamlined approach is ideal for focused studies with **specific attributes** or **smaller sample sizes (<100)**, providing an efficient way to measure individual risk tolerance. Conversely, DCE is particularly effective in capturing patient preferences in more **complex settings** with multiple attributes and trade-offs. Both methods offer **comparable MAB** and **MAR** estimates,

underscoring their utility across various research contexts. Researchers should choose between TT and DCE based on study complexity and resources, with TT suited for direct assessments and DCE for more detailed preference analysis.

Abbreviations: DCE, discrete choice experiment; TT, threshold technique

Most of the included studies were quantitative studies (34 studies), either investigating the use of the TT alone or comparing TT and DCE. Five studies were qualitative and/or engaging in expert discussions about the relative merits of TT and DCE.

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