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Where MaxDiff has MinValue
Ways to Avoid Misuse of a Helpful Tool

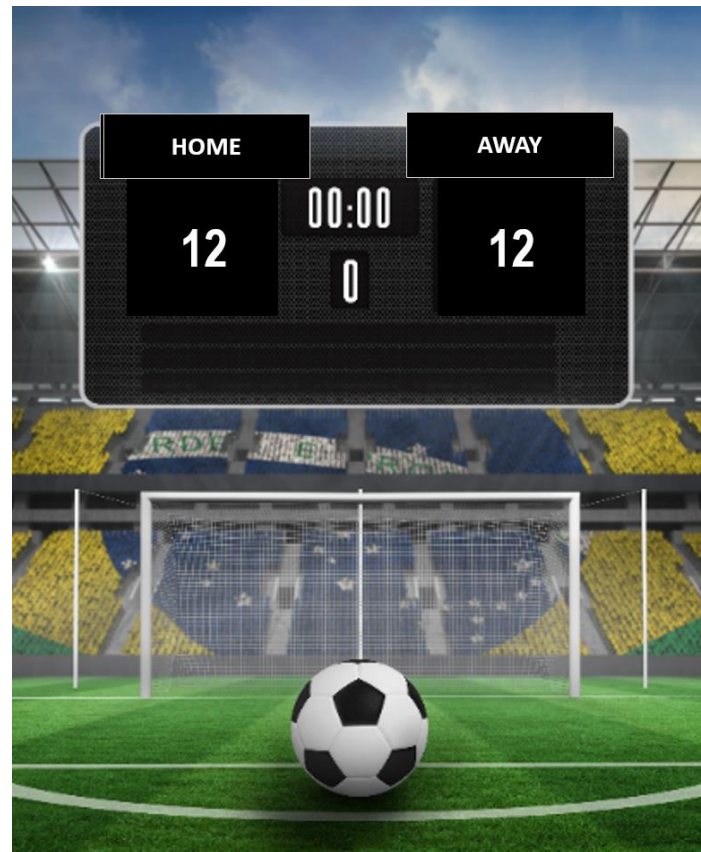By Debbie Kossman and Stephan Benzekri

Imagine this scenario.

You've gotten a request from your Product Manager to measure the appeal of 15 SUV options – things like heated seats, four-wheel drive, and remote start. There's also interest in understanding whether there are distinct segments of buyers who differ with respect to their priorities. You think first of a task that requires respondents to trade off various options – ideally with no ties allowed. In sports or marketing research, ties are frustrating.
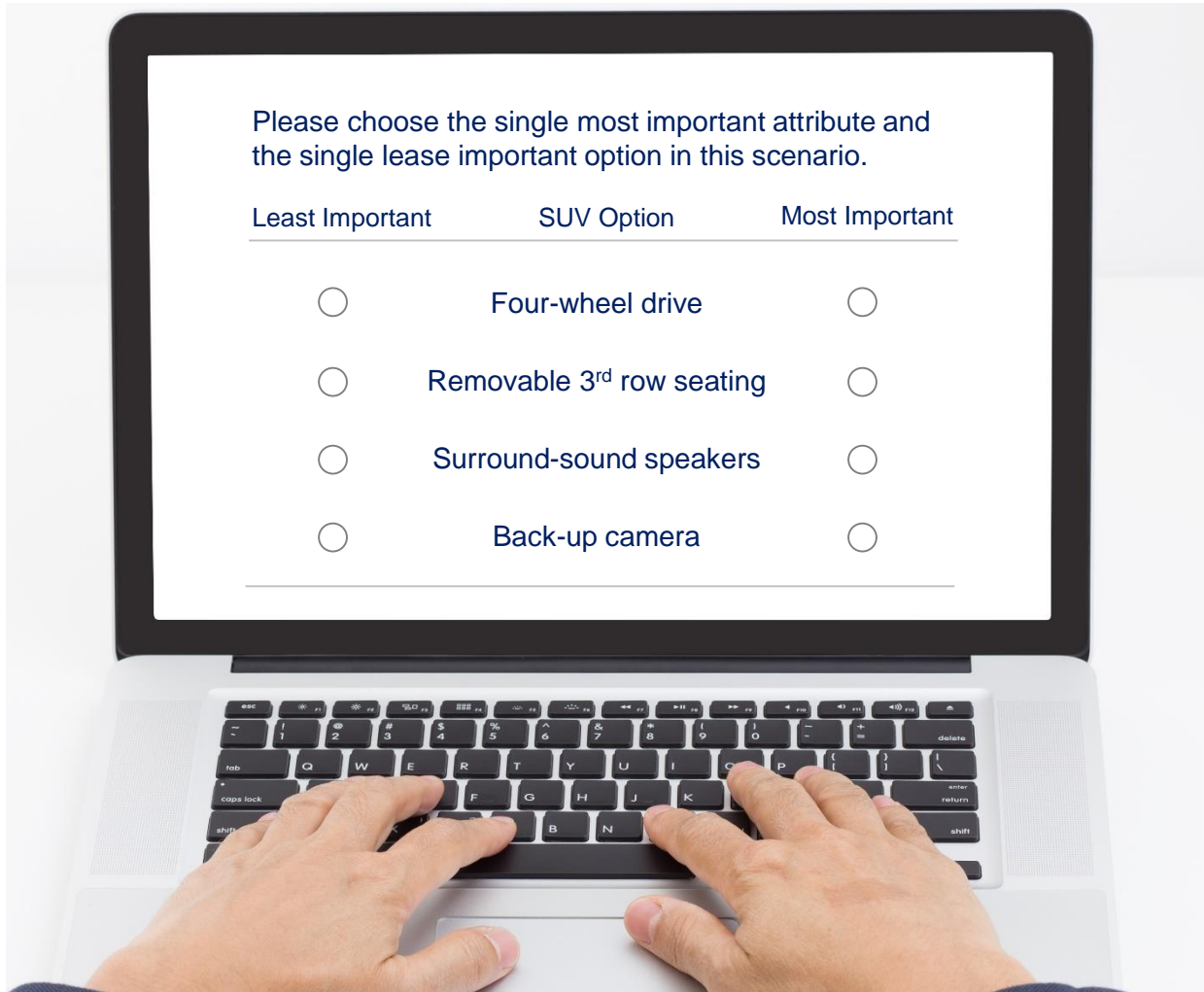
In designing an approach, you're mindful of the need to keep respondents engaged – both to ensure data quality and to maximize the chances that respondents actually complete the survey.

You think about **simple ranking** – a straight-forward task with design and modeling cost – but you're aware that ranking more than 10 items can be quite tedious and difficult. People tend to lose patience (as well as conviction) often rendering the bottom tier of ranks nearly insensitive. Even ranking 10 things can feel oppressive.

Then you consider some sort of **choice-based conjoint task** that would require respondents to make trade-offs among SUV options. But conjoint is a method you associate with forecasting, and no one has asked you to predict interest in a fully configured product. It's true that conjoint also allows you to derive the importance of attributes but you're reminded that this method has challenges of its own, not least of which is the response burden. You'd need to present roughly 15 conjoint scenarios to each respondent, and if you manage to reduce the task with an "adaptive" approach, each respondent's low-priority options will get quickly discarded, sending some potentially useful data to the cutting room floor.

*Then you remember **MaxDiff**.* MaxDiff lets you derive the relative importance or appeal of many items by sequentially pitting attributes against one another in smaller subsets, like the task in the scenario below. Responding to these scenarios is substantially easier than ranking *all* of the SUV options in a single task and, by the way, does not allow for ties. Here's an illustration.

Please choose the single most important attribute and the single lease important option in this scenario.

Least Important	SUV Option	Most Important
○	Four-wheel drive	○
○	Removable 3rd row seating	○
○	Surround-sound speakers	○
○	Back-up camera	○

Based on the pattern of choices across all scenarios, MaxDiff will generate the "utility" of every SUV option for each respondent. These 15 utilities are those that do the *best job* of re-creating the actual survey choices provided by a given respondent.
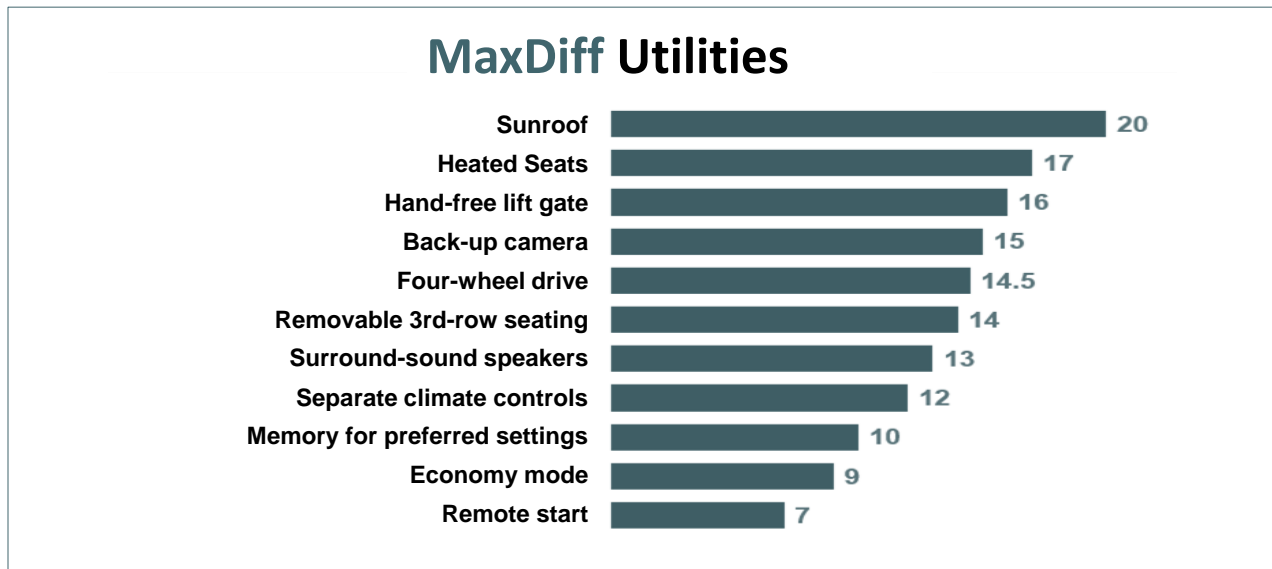
You're satisfied that MaxDiff will rank order all of the SUV options without ties, and that it will allow you to segment respondents based on what they find more or less appealing. So what could be wrong with this option?

What's wrong is what's missing, the thing it *doesn't* tell you: How *much more* appealing one attribute is than another. Like simple rankings, MaxDiff offers no measurement of intensity of feelings or *distance* between options. And since there is also no rating scale in MaxDiff to anchor the data, there's no way to determine whether any attribute is truly appealing or how much that attribute matters in the broader scheme of things.

Here, for instance, are two very different types of "close calls" which MaxDiff can't distinguish.

Marginal preference, HIGH substitutability — VS. — Prefer *slightly*

Strong preference, LOW substitutability — VS. — Prefer *strongly*

To see how MaxDiff utilities can lead people astray, note that it produces a set of utilities which when graphed, *look to the naked eye* as if they are scaled to reflect relative importance. They are not. We have no way of telling from the bars below whether the top priority attribute is many more times as important as the lowest priority attribute or whether it is just modestly so. The assumption that we can gain statistical insight on absolute distance between attributes by looking at the size of the MaxDiff utilities is a common misconception. "Utilities" *sound* more data-rich than they actually are.

MaxDiff Utilities

Attribute	Value
Sunroof	20
Heated Seats	17
Hand-free lift gate	16
Back-up camera	15
Four-wheel drive	14.5
Removable 3rd-row seating	14
Surround-sound speakers	13
Separate climate controls	12
Memory for preferred settings	10
Economy mode	9
Remote start	7

The problem doesn't go away if you use a specialized data visualization technique – for instance, correspondence mapping, which plots the MaxDiff utilities. Arguably, that's potentially even more misleading because we're conditioned to see a "map" as a way to visualize spatial relationships and proximities. The correspondence map will treat those utilities as if they measure distance. It can't do anything else.

So when *is* MaxDiff useful ...
and when should you look to other tools?

> Rely on MaxDiff when you want a straight-forward way to deprioritize some attributes among a large number -- for instance, when you need to identify a top tier for closer study.

> Give serious thought to ratings (or constant sum techniques) as alternative in cases where distance is important and some absolute measure of value to customers is helpful to have.

> Avoid MaxDiff when you need to calculate "willingness to pay" or an ROI on any feature. For those applications, rely on methods like conjoint that allow you to measure distance between options and attach a monetary value to them.

> Don't gravitate toward any method simply because it avoids ties. Customer indifference can be real, and it gives you permission to choose priorities – or to cultivate them – based on your own considerations. *Forcing* choices may be tantamount to creating noise.

> If you think there's gold to be mined by calculating subtle customer preferences, choose methods that meaningfully measure small distances rather than methods that simply prioritize. Just as MaxDiff utilities can overstate distance, they can also be insensitive to small differences.

About NAXION

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