



MODELING

Multi-Behavioral Model Frequently Asked Questions



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What is a multi-behavioral model?

A multi-behavioral model, also known as generalized logistic regression, predicts the estimated profit value (EPV) of an audience. This is done by calculating the probabilities of each possible outcome and weighing those probabilities against corresponding profit and cost values.

What types of offers benefit from a multi-behavioral model?

There are two use cases where a multi-behavioral model can be very effective:

1. **Campaigns with Introductory Offers & High Churn Rates:** Subscription commerce or membership programs that lead with a discounted introductory offer are strong candidates for multi-behavioral models as they are at risk of losing money on consumers who don't make a second purchase. A multi-behavioral model can help brands predict the prospects that will pay for both the intro offer and the first full priced shipment in order to turn a profit on the campaign.
2. **Campaigns with High Fulfillment & Shipping Costs:** When the cost of bad debt is high relative to the profit earned from a paid order, it becomes critical to avoid poor performers. Returns and bad debt incur high costs and can quickly drag down the performance of a campaign. A multi-behavioral model can help identify the prospects least likely to engage in costly behavior.

What types of outcomes does a multi-behavioral model predict?

The model calculates the probability of a consumer's potential interaction with the brand. In most cases the model will consider six mutually exclusive outcomes for each prospect, each with a corresponding profit or cost to the marketer. However, every situation is different and the number and types of outcomes can be customized to the marketer. The most commonly used outcomes are outlined below — along with sample cost and profit values — each of which is provided by the marketer.

	Silent/Non-responder: Prospect does not respond to the offer, marketer loses the cost of the outreach	(\$0.58)
	Intro Paid Only: Prospect pays for the introductory offer, but does not take any additional shipments	(\$1)
	Returns 1st Full: Prospect takes the intro offer but returns the first full priced shipment for a refund	(\$3)
	Bad-Debt: Prospect accepts intro offer and first full priced shipment, but does not pay for either	(\$6)
	Paid 1: Prospect pays for intro offer and first full priced shipment	\$30
	Paid 2+: Prospect pays for at least 2 full priced shipments	\$50





How are multi-behavioral models calculated?

Multi-behavioral models start their work by simultaneously predicting the odds of the consumer performing each possible behavior. In the example below, probabilities are calculated for Aaron, Andrea, Bill, Cathy and Dennis.

Prospect	Silent	Intro Only	Returns 1st	Bad-Debt	Paid 1	Paid 2+	Total
Aaron	0.968	0.008	0.001	0.008	0.011	0.004	1.000
Andrea	0.940	0.015	0.010	0.015	0.018	0.002	1.000
Bill	0.980	0.008	0.008	0.001	0.002	0.001	1.000
Cathy	0.930	0.020	0.008	0.017	0.020	0.005	1.000
Dennis	0.990	0.005	0.001	0.002	0.002	0.000	1.000
AVERAGE	0.962	0.011	0.006	0.009	0.011	0.002	

Next, the model calculates the estimated profit value (EPV) of each consumer by multiplying the profit and cost values of each outcome by their respective probabilities.

Prospect	Silent	Intro Only	Returns 1st	Bad-Debt	Paid 1	Paid 2+	EPV
Aaron	$-\$0.58 \times 0.968$	$+\$1.00 \times 0.008$	$+\$3.00 \times 0.001$	$+\$6.00 \times 0.008$	$+\$30.00 \times 0.011$	$+\$50.00 \times 0.004$	(\$0.09)
Andrea	$-\$0.58 \times 0.940$	$+\$1.00 \times 0.015$	$+\$3.00 \times 0.010$	$+\$6.00 \times 0.015$	$+\$30.00 \times 0.018$	$+\$50.00 \times 0.002$	(\$0.04)
Bill	$-\$0.58 \times 0.980$	$+\$1.00 \times 0.008$	$+\$3.00 \times 0.008$	$+\$6.00 \times 0.001$	$+\$30.00 \times 0.002$	$+\$50.00 \times 0.001$	(\$0.50)
Cathy	$-\$0.58 \times 0.930$	$+\$1.00 \times 0.020$	$+\$3.00 \times 0.008$	$+\$6.00 \times 0.017$	$+\$30.00 \times 0.020$	$+\$50.00 \times 0.005$	\$0.16
Dennis	$-\$0.58 \times 0.990$	$+\$1.00 \times 0.005$	$+\$3.00 \times 0.001$	$+\$6.00 \times 0.002$	$+\$30.00 \times 0.002$	$+\$50.00 \times 0.000$	(\$0.53)
AVERAGE	$-\$0.58 \times 0.962$	$+\$1.00 \times 0.011$	$+\$3.00 \times 0.006$	$+\$6.00 \times 0.009$	$+\$30.00 \times 0.011$	$+\$50.00 \times 0.002$	(\$0.20)

The end result is a prediction of the profit value of each consumer based on their likelihood to carry out each action.

Prospect	EPV
Cathy	\$0.16
Andrea	(\$0.04)
Aaron	(\$0.09)
Bill	(\$0.50)
Dennis	(\$0.53)

Why not just do a binary model for people likely to result in 2+ shipments?

Often times the best responders are also the worst customers. Multi-behavioral models have the unique ability to elevate “good” behavior (e.g. high probability of 2+ shipments) while simultaneously suppressing “poor” behavior (e.g. high probability of write-offs).

In most cases, Alliant will build a binary model on the desired behavior (e.g. prospects with the propensity to purchase 2+ shipments) in conjunction with a multi-behavioral model. The results of the models will be compared and a decision is made on which model to use. In most cases the multi-behavioral model produces the more profitable audience.

Why do I need to provide profit and cost values to Alliant?

Profit and cost values are needed in order to calculate the Estimated Profit Value (EPV) of each consumer. The model will rank all prospects in descending value based on their EPV in order to identify those most likely to generate the highest profit for the campaign.

Understandably, some businesses are reluctant to share financial information with partners like Alliant. Rest assured that Alliant takes its obligations under non-disclosure agreements very seriously, and that your information will only be used by those who need it to create and evaluate your model.

