Novel Models Accounting for Social Interactions on Individual Choice Behavior

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INTRODUCTION

Individual decisions are often influenced by **social factors**, especially in health-related contexts where choices impact both healthcare users and those around them.

Current models in microeconomic choice theory typically **overlook** these **social influences**, treating decision makers as isolated entities driven by personal preferences.

This significant **oversight** is **particularly relevant in health-related** decision-making, where choices are frequently made within social groupings.

OBJECTIVE

- To introduce **structural models of choice behavior** that include single or multiple identifiable social influences on constructs within choice models, that is, preferences (systematic and stochastic) and choice set formation[1].
- To elaborate on **measurement strategies** that allow **identification** of **social influence effects**. This discussion includes the **data requirements** to **uncover social influence mechanisms**[2] and their **association with choice constructs**[3] and the discrimination of endogenous and exogenous social effects as well as the correlated and non-social ones.

METHOD

- This conceptual paper formalizes structural models of choice grounded in the **goal-balancing framework**[4] and measurement. The core idea underlying our models is that the **DM** attempts to **balance** the **goals** of **maximizing** their **own preferences** and **adhering** to **social preferences**.
- To allow the decision-makers to balance their own and social preferences, we characterize[4] **multiple goal pursuit** as a **vector optimization** problem.
- This problem is **solved** through a **non-linear solution** that **reduces** the **multiple-goal balancing** strategy to a **single measure** that results in a **multinomial logit model**.
- Notably, **stochasticity arises** from the **decision-maker's balancing of personal preferences versus a goal of adherence to social preferences**. This contrasts with random utility models, where the stochasticity reflects the influence of variables unobserved by the analyst on the individual's choice.

RESULTS

- The **choice behavior mimicry** model capture the impact of observed or recommended behaviors from single or multiple influencers. They account for how knowledge of others' preferences can shape the decision-making process.

1. $[max]\Omega_1(p_n|M,V_n,w_n,,q_n) = w_n \sum_{i\in M} p_{ni}V_{ni} + (1-w_n)\sum_{i\in M} p_{ni}\ln\left({}^{p_{ni}}/_{q_{ni}^{\delta_n}}\right)$
   - Subject to $\sum_{i\in M} p_{ni} = 1;\ p_{ni} \geq 0, \forall i \in M$
- The optimization of (1) leads to:

2. $p_j = \frac{q_{nj}^{\delta} exp(rV_{nj})}{\sum_{i\in M} q_{ni}^{\delta} exp(rV_{ni})}, \forall j \in M; where\ r = \frac{w}{(1-w)}$

- The **screening behavior** model elucidates the trade-offs between personal tastes and social influences that determine the availability or acceptability of alternatives.
- $\phi_{nj} = \begin{cases} 1 & influencer\ "allows"\ alternative\ j \in M \\ 0 & otherwise \end{cases}$
- $C_n = \{j|\phi_{nj} = 1, \forall j \in M\}$

1. $[\max]\ \Omega_5(p|M,V,w_n,\phi_n) = w_n \sum_{i\in M} \phi_{ni}(p_i V_{ni}) + (1-w_n)\sum_{i\in M} \phi_{ni}(p_i \ln p_i)$

   Such that $\sum_{i\in M} \phi_{ni}p_i = 1;\ \phi_{nk}p_k \geq 0, \forall k \in M;\ \phi_{nk} = 0 \Rightarrow p_k = 0, \forall k \in M - C_n$

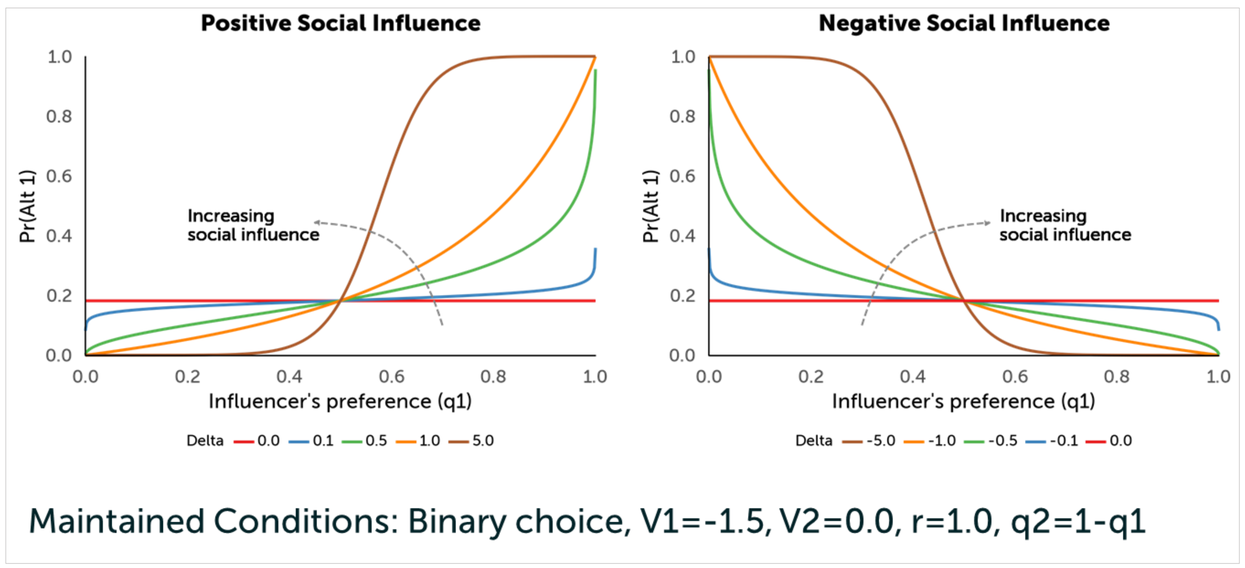

Figure 1: Example of choice behavior mimicry model

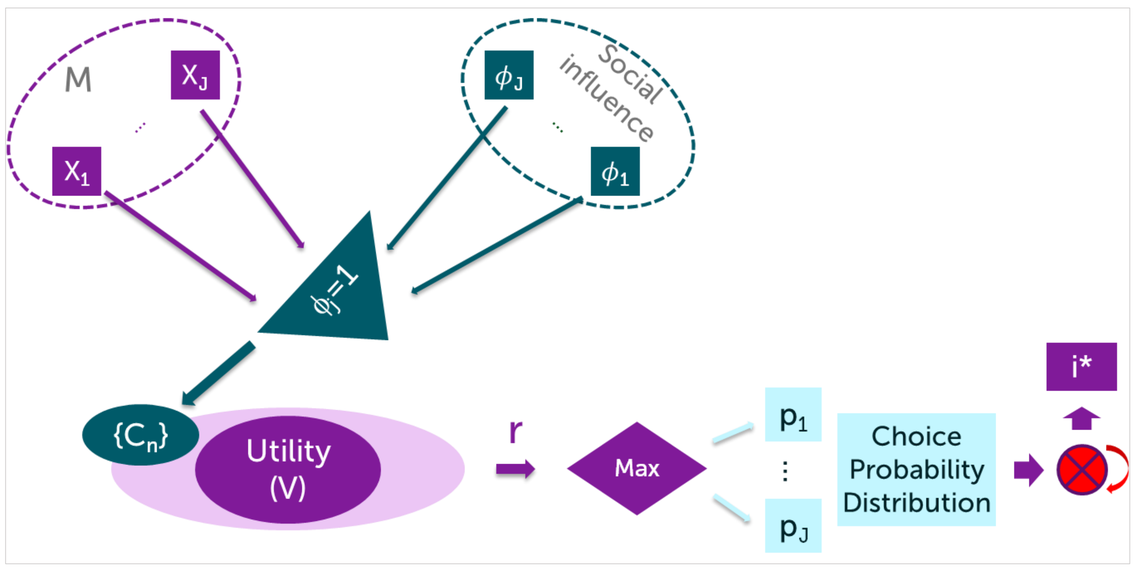

Figure 2: Screening behavior process

CONCLUSIONS

By integrating social context into the microeconomic framework of individual decision-making, our models:

- Offer a **more realistic** depiction of **behavior within** the **utility maximization** paradigm
- **Enhance** the **explanation** and **prediction** of healthcare user behavior, providing valuable **insights** for **researchers** and **policymakers**.
- This integration **supports** the **design**, **selection**, and **implementation** of more effective **health policies**.
- We **strongly encourage the empirical testing** of these models in diverse health contexts to validate their robustness and applicability.

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