

令和 6 年 6 月 20 日現在

機関番号：33914  
研究種目：若手研究  
研究期間：2018～2023  
課題番号：18K12739  
研究課題名（和文）A study on reference-dependent choice procedures with endogenously determined reference(s)  
研究課題名（英文）A study on reference-dependent choice procedures with endogenously determined reference(s)  
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交付決定額（研究期間全体）：（直接経費） 3,100,000円

研究成果の概要（和文）：この研究プロジェクトは、大きく2つの部分に分かれています。第1部では、人々が選択を行う方法を理解する新しいアプローチが提示されます。このアプローチでは、単純で直感的な決定と複雑で熟慮された決定の2つの選好を考慮しています。従来の合理的な意思決定に関する仮定を緩和することで、このモデルは人々の予期しない行動を説明することができます。第2部では、人々の意思決定が参照点にどのように影響を受けるかが調査されます。参照点には、既に所有しているものや損失と見なされるものが含まれます。この部分では、所有効果、損失回避、および参照依存型のショートリストという3つのモデルが検討されます。

#### 研究成果の学術的意義や社会的意義

Our models help organize and make sense of different ways people choose between options and offers a valuable tool for understanding and predicting real-life decision-making and help create better policies and strategies to encourage positive behaviors.

研究成果の概要（英文）：There are two major parts of the research project. The first part presents a new way to understand how people make choices by considering two different types of preferences: simple, gut-feeling decisions and more complex, thoughtful decisions. By relaxing some traditional assumptions about rational decision-making, the model can explain a variety of unexpected behaviors people exhibit. The second part examines how people's decisions are influenced by their reference points, such as what they already own or what they consider a loss. It looks at three specific models: the endowment effect, loss aversion, and reference-dependent shortlisting. By exploring the unique and overlapping behaviors of these models, the research provides deeper insights into how reference points shape our choices.

研究分野：Economic Theory

キーワード：bounded rationality

## 様式 C - 19、F - 19 - 1、Z - 19 (共通)

### 1. 研究開始当初の背景

The research project delves into the limitations and anomalies of traditional rational choice theory, which posits that individuals make consistent, utility-maximizing decisions. However, numerous observed behaviors, such as the endowment effect (where people value their possessions more than equivalent non-possessions) and loss aversion (where losses are felt more acutely than equivalent gains), challenge this framework. These anomalies suggest that preferences can be influenced by external references or the context of choices.

- Reference-Dependent Choices: These preferences indicate that the value assigned to an option depends on a reference point, which could be a current endowment or a status quo. This concept helps explain behaviors like loss aversion and the endowment effect. For example, individuals might demand a higher price to sell an object they own compared to the price they are willing to pay to acquire it. This discrepancy is a fundamental departure from rational choice theory, which would predict consistent valuation regardless of ownership status.
- Menu-Dependent Preferences: The set of available options (the menu) influences the decision-making process. Traditional models assume stable preferences regardless of the menu, but real-world choices often deviate from this assumption. For instance, the presence of a particularly attractive or unattractive option can affect the perceived value and attractiveness of other options in the set, a phenomenon known as the context effect.
- Nonstandard Choice Procedures: The studies investigate alternative decision-making processes that do not adhere strictly to rational choice theory. These include heuristic methods, partial menu evaluations, and shortlisting strategies, which better mirror actual human behavior.

### 2. 研究の目的

The primary goal across these papers is to create more accurate and comprehensive models that reflect the complexities of real-world decision-making. The specific objectives include:

- Developing Flexible Models: Formulating models that account for reference-dependent and menu-dependent preferences, capturing a broader range of behaviors than traditional models. By incorporating factors such as reference points and menu context, these models aim to provide a more realistic depiction of how decisions are made in practice.
- Characterizing Choice Procedures: Providing formal characterizations of various choice procedures to understand how they deviate from or align with rational choice theory. This involves defining specific conditions under which different behaviors occur, such as the conditions that lead to the endowment effect or loss aversion.
- Comparing Models: Delineating and comparing different reference-dependent models to explore their unique and overlapping behavioral implications. This comparative analysis helps in identifying the strengths and limitations of each model, providing insights into which models are best suited for different types of decision-making scenarios.
- Extending Existing Theories: Expanding upon prior work to cover more general and practical scenarios, including those with non-positive thresholds and multi-dimensional preferences. This extension ensures that the models are robust and applicable to a wider range of real-world situations, accommodating more diverse and complex behaviors.
- Understanding Intersections: Investigating the intersections of different models to identify meaningful special cases and understand the broader implications of reference points in decision-making. This helps in recognizing patterns that might be overlooked when models are considered in isolation, providing a more holistic understanding of how reference points influence behavior.

### 3. 研究の方法

The methodologies employed are primarily theoretical and involve developing, characterizing, and comparing models through various mathematical and conceptual frameworks:

- Generalization of Existing Models: Building on previous theories, researchers generalize the conditions and constraints to create more flexible models. For

example, they extend threshold representations to depend on both the menu and pairs of alternatives. This approach accommodates a wider range of behaviors and scenarios, such as situations where the threshold for considering an option depends on the relative attractiveness of the alternatives.

- Numerical Representations: Utilizing numerical methods to represent nested systems of strict partial orders. This approach helps to model complex decision-making processes involving multiple criteria. It allows for the integration of different dimensions of preferences into a coherent overall assessment, providing a more detailed and accurate representation of how decisions are made when multiple factors are considered simultaneously.
- Characterizing Behavioral Patterns: By defining specific conditions and criteria, researchers characterize the distinct behavioral patterns associated with different reference-dependent models, such as the endowment effect, loss aversion, and shortlisting. This involves identifying the specific factors that trigger these behaviors and how they interact with each other to influence decision outcomes.
- Comparative Analysis: Systematically comparing different models to delineate their boundaries and understand their unique and shared features. This involves examining the intersections of models to find special cases that highlight specific behaviors. Through this comparison, researchers can identify the most robust and generalizable aspects of each model, providing a comprehensive understanding of how different factors influence decision-making processes.

Through these methods, the research provides a more detailed and accurate depiction of decision-making processes, reflecting the complexities and nuances of human behavior in various contexts.

#### 4 . 研究成果

I have published 5 papers under this research project. The papers achieve advancements in understanding and modeling nonstandard choice behaviors: (i) I have provided generalized models that capture a wider range of decision-making behaviors, beyond the constraints of traditional rational choice theory; (ii) the research offers frameworks for organizing and comparing different reference-dependent and menu-dependent choice models; (iii) the research introduces flexible threshold representations and multi-dimensional preference aggregations, allowing for more comprehensive and realistic modeling of decision processes; (iv) the studies delineate the boundaries of various models and explore intersections, enhancing the theoretical understanding of reference effects and their practical implications; (v) the papers contribute to a deeper understanding of how reference points and decision criteria influence choice behavior, offering insights that are applicable in various practical and theoretical contexts. I summarize each individual papers as follows.

- Paper 1 investigates a choice model with menu-dependent preferences, providing a framework that unifies three nonstandard choice procedures. By relaxing rational choice assumptions, the model accounts for various anomalies and characterizes behavior using squeezing conditions.
- Paper 2 extends Masatlioglu and Ok 's work to characterize a reference-dependent shortlisting model with specific criteria (asymmetric, acyclic, transitive, linear). This model helps compare reference-dependent and reference-free choices, offering insights into how reference points influence shortlisting processes.
- Paper 3 explores reference-dependent choice procedures using utility and threshold functions, without imposing strict positivity on thresholds. It examines cases where the threshold function depends on both alternatives, broadening the understanding of reference-dependent behaviors.
- Paper 4 provides two numerical representations for nested systems of strict partial orders. One uses utility and threshold functions, generalizing threshold representations, while the other aggregates multi-dimensional preferences, reflecting decision-making with multiple criteria.
- Paper 5 examines behavioral implications of different roles of the reference alternative, delineating boundaries of three reference-dependent models (endowment effect, loss aversion, shortlisting). It explores intersections of these models to identify meaningful special cases.

Through these works, the research provides a more detailed and accurate depiction of decision-making processes, reflecting the complexities and nuances of human behavior in various contexts. The societal impact of these research findings on nonstandard

choice behaviors is significant across multiple domains. By providing a deeper understanding of reference-dependent and menu-dependent preferences, these models can improve marketing strategies and product placement, leading to better alignment with consumer behavior. Policymakers can design more effective interventions to promote healthier, sustainable, and economically beneficial choices. Overall, these studies offer valuable tools for crafting more effective strategies and interventions in various sectors.

## 5. 主な発表論文等

〔雑誌論文〕 計5件（うち査読付論文 5件/うち国際共著 0件/うちオープンアクセス 1件）

1. 著者名 Qin Dan	4. 巻 12
2. 論文標題 A Note on Numerical Representations of Nested System of Strict Partial Orders	5. 発行年 2021年
3. 雑誌名 Games	6. 最初と最後の頁 1~9
掲載論文のDOI（デジタルオブジェクト識別子） 10.3390/g12030057	査読の有無 有
オープンアクセス オープンアクセスとしている（また、その予定である）	国際共著 -
1. 著者名 Qin Dan	4. 巻 198
2. 論文標題 Exclusive shortlisting choice with reference	5. 発行年 2021年
3. 雑誌名 Economics Letters	6. 最初と最後の頁 109675 ~ 109675
掲載論文のDOI（デジタルオブジェクト識別子） 10.1016/j.econlet.2020.109675	査読の有無 有
オープンアクセス オープンアクセスではない、又はオープンアクセスが困難	国際共著 -
1. 著者名 Dan Qin	4. 巻 20
2. 論文標題 A Note on Reference-Dependent Choice with Threshold Representation	5. 発行年 2019年
3. 雑誌名 The B.E. journal of theoretical economics	6. 最初と最後の頁 1-6
掲載論文のDOI（デジタルオブジェクト識別子） 10.1515/bejte-2018-0142	査読の有無 有
オープンアクセス オープンアクセスではない、又はオープンアクセスが困難	国際共著 -
1. 著者名 Dan Qin	4. 巻 112
2. 論文標題 A simple model of two-stage choice	5. 発行年 2024年
3. 雑誌名 Journal of Mathematical Economics	6. 最初と最後の頁 102979
掲載論文のDOI（デジタルオブジェクト識別子） 10.1016/j.jmateco.2024.102979	査読の有無 有
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1. 著者名 Dan Qin	4. 巻 146
2. 論文標題 Differentiating roles of the reference alternative	5. 発行年 2024年
3. 雑誌名 Games and Economic Behavior	6. 最初と最後の頁 196-221
掲載論文のDOI (デジタルオブジェクト識別子) 10.1016/j.geb.2024.05.008	査読の有無 有
オープンアクセス オープンアクセスではない、又はオープンアクセスが困難	国際共著 -

〔学会発表〕 計3件 (うち招待講演 0件 / うち国際学会 2件)

1. 発表者名 Dan Qin
2. 発表標題 A general model of choice overload
3. 学会等名 Winter School of the Econometric Society (国際学会)
4. 発表年 2019年

1. 発表者名 Dan Qin
2. 発表標題 Reference-dependent choice: A comprehensive analysis
3. 学会等名 日本経済学会 2018 春季大会
4. 発表年 2018年

1. 発表者名 Dan Qin
2. 発表標題 Reference-dependent choice: A comprehensive analysis
3. 学会等名 China meeting of the econometric society (国際学会)
4. 発表年 2018年

〔図書〕 計0件

〔産業財産権〕

〔その他〕

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6. 研究組織

	氏名 (ローマ字氏名) (研究者番号)	所属研究機関・部局・職 (機関番号)	備考
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7. 科研費を使用して開催した国際研究集会

〔国際研究集会〕 計0件

8. 本研究に関連して実施した国際共同研究の実施状況

共同研究相手国	相手方研究機関
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