How the Behaviour of a Few Early Movers Changes Others' Expectations and Triggers Information Cascades: An Analysis Based on Game Theory and Threshold Mechanisms

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Abstract In today's online public opinion, a common phenomenon is that "a small number of people speak out and the whole internet explodes." Opinion leaders often make up only a very small share of users, but they can guide the direction of the whole discussion. This paper develops a conceptual model and uses an illustrative case analysis. It does not aim to provide empirical or causal verification. This paper analyses how the behaviour of a few early movers changes later individuals' expectations about the importance of an event and about what others will do. It then studies how these changes affect their decision to follow. By combining information cascade theory and threshold models, this paper summarizes the conditions under which early movers can trigger collective following. It also discusses what these findings mean for research on online public opinion.

Keywords information cascades; early movers; threshold mechanisms; expectations

1. Introduction

1.1 Background and Research Question

Think about how things spread on social media. Usually, only a handful of users do something first, while everyone else just watches. But then, very quickly, a huge crowd starts to follow. We usually call this the "a few people speak out and the whole internet explodes" phenomenon [1]. What makes this so interesting is that the people in first group is actually very small. However, their early actions clearly change how the majority behaves later on. So, we have to ask: why the small group can provide such big influence? What is the real reason behind this? This paper is going to answer these questions. To do this, we follow a simple causal chain:

Early mover behaviour → observers update expectations → individuals reach action thresholds → a cascade appears.

Existing studies usually talk about information cascades, thresholds, and global games separately. But not many of them put "early action, expectation updating, threshold crossing, and cascade" into one single framework. This paper connects these mechanisms together and uses a real case to show how they work.

1.2 Purpose and Significance

The main goal of this paper is to build a conceptual threshold model. Basically, this model explains how early movers affect later people through two things: expectation updating and thresholds.

This study matters for both theory and practice. For theory, we use the threshold model as our main tool, but we also rely on information cascade theory to explain the big picture, and global games to explain how people update their signals. Doing this helps us connect individual decisions with group outcomes. For practice, understanding this helps explain why online opinions can change so fast. It also explains why a small number of voices can sometimes take over the whole agenda.

1.3 Model Preview

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2. Literature Review

2.1 Related Theories

To understand this, we need to look at a few related theories.

First, we have information asymmetry. Basically, this means not everyone has the same amount of information [2]. Some people might know more about what's going on, while others know less. In the context of online discussions, early movers might actually have more information, or they just happen to act earlier than everyone else.

Second, there is the idea of a self-fulfilling expectation. This is when people's beliefs actually change what they do, and their actions end up making that belief come true. For example, if people think others are going to act, they might join in too. And by doing so, they make the whole thing happen.

Third, we have the information cascade. This happens when people stop relying on their own private information and just copy what others are doing [1]. They do this mostly because they assume the people who acted before them must know something they don't.

The fourth concept is the threshold effect. This just means that people will only take action when the number of people who did it before them reaches a certain level [3]. Of course, this level, or threshold, is different for everyone. These concepts have been widely talked about in studies regarding online opinions [7, 8].

Overall, the threshold model is our main framework here. The information cascade theory helps explain the big picture, and global games help us understand how people update their signals when they don't have all the information.

2.2 Theoretical Basis: Division of Labour and Choice of Main Model

This paper does not put the three main theories side by side. Instead, it assigns each theory a specific role. The threshold model serves as the main model, because the core chain of this paper—early mover behaviour, expectation updating, threshold crossing and cascade—is mainly explained by thresholds. Information cascade theory explains the macro-level outcome: once enough individuals follow, a cascade appears and grows. Global games explain how signals are updated under incomplete information, showing how private signals and public signals interact [4]. In conclusion, the threshold model is the main model, information cascade theory explains the macro result, and global games explain the micro-level expectation updating.

2.3 Gaps in the Literature

Existing studies have common points and differences. Many studies agree that early movers matter. However, they do not always explain clearly how expectations change. Some studies focus on network structure. Others focus on individual thresholds. This paper attempts to integrate these perspectives by constructing a unified analytical chain and examining its explanatory value through a case illustration.

3. Building the Conceptual Threshold Model

3.1 Participants

There are two types of participants in the model. The first are early movers, a small number of people who act first. They post, share, or comment early. The second are later individuals, the majority who observe and then decide whether to follow. Let N be the total number of users, m the number of early movers, and N − m the number of later individuals. Each participant is assumed to be rational and to want to maximize their expected benefit.

3.2 Information Structure

Information is asymmetric. Let $\theta \in \{0, 1\}$ denote the true state of the event, where $\theta = 1$ means the event is important and $\theta = 0$ means it is not. Each individual i receives a private signal s_i about θ. Participants do not know the true state; they only know their own signal. They can observe early movers' actions, but they do not know their true motives.

3.3 Observable Behaviour

Early movers' actions are publicly observable. Let m_t be the number of early movers observable at time t. As t increases, m_t increases. Later individuals can see the number and behaviour of early movers. They can also see how many other later individuals have followed.

3.4 Action Set

Each participant has two actions: follow (post, repost, comment, etc.) or not follow (stay silent). Let $a_i \in \{0, 1\}$, where a_i = 1 means follow and a_i = 0 means not follow. The action set is binary. This makes the model simple and easy to illustrate with case material.

3.5 Costs and Benefits

Following brings benefits such as social approval, information benefit, and expression benefit. It also brings costs such as social risk, time and effort, and reputation cost. Let B_i be the benefit of following and c_i the cost of following. The net benefit is $E[B_i \mid m_t]$ − c_i. Not following avoids these costs but may mean missing important information or social participation.

3.6 Belief Updating

Later individuals update their beliefs in a qualitative

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way. They first see their private signal. Then they observe early movers' actions. Based on these actions, they update their expectation about the importance of the event and their expectation about others' actions. Let p_ $i = P(\theta = 1 \mid s_i, m_t)$*beindi* vidual i's belief that the event is important after observing m_t. This paper uses a conceptual updating rule rather than a strict probabilistic model: Posterior belief = conceptual updating (private signal, number of early movers, network density)

3.7 Individual Decision

Later individuals compare the expected benefit of following with the cost. Individual i chooses a_i = 1 if and only if $E[B_i \mid m_t]$ − c_i > 0. If it is not, they do not follow. The expected benefit depends on two things: the expected importance of the event, and the expected number of other followers.

3.8 Threshold Condition

Each later individual has a threshold. The threshold can be defined as:

$$n_i^* = \min n : E[B_i \mid n] 0 c_i > 0 \quad (1)$$

In this expression, n is the number of early movers that individual i can observe. $E[B_i \mid n]$*istheexpe* cted benefit of following given that n early movers have already acted. The threshold n_i* is the smallest n at which this expected benefit exceeds the cost c_i. The threshold varies across individuals. A higher risk preference lowers n_i*, because the individual is more willing to act early. A central network position also lowers n_i*, because the individual can observe more early movers and receive stronger signals. This definition connects the individual decision in 3.7 with the threshold condition here.

3.9 Discrete Time and Sequential Decision-Making

Information cascades are sequential and dynamic by nature. This paper uses discrete time and sequential decision-making. The process has four stages. In the first stage, early movers act: a few early movers post, share, or comment first, while most later individuals have not acted yet. In the second stage, later individuals observe: they see the number and behaviour of early movers, and these actions are public signals. In the third stage, expectations are updated: later individuals update their expectation about event importance and about others' actions. In the fourth stage, they decide whether to follow: they compare expected benefit with cost, and if the expected benefit exceeds the threshold, they follow. When enough people cross their thresholds, a cascade appears. This discrete sequence matches the main chain of the paper.

3.1 0 Propositions

Based on the model, this paper sets up four propositions.

Proposition 1 (Information sensitivity): When information is uncertain, later individuals rely more heavily on observable actions when updating their beliefs, making a cascade more likely.

Proposition 2 (Threshold condition): Each later individual has an action threshold. When the number of observable early movers exceeds this threshold, the individual follows; when enough individuals cross their thresholds, an information cascade appears.

Proposition 3 (Expectation mediation): An increase in the number of early movers changes later individuals' expectations about event importance and others' actions, thereby increasing the probability of following.

Proposition 4 (Network density): Network density may moderate the effect of early movers on following decisions, although this relationship remains a theoretical proposition in the present paper.

4. Propositions and Analytical Framework

4.1 Analytical Framework

The propositions in Section 3.10 provide the analytical framework for the case illustration. The case is used to examine whether the observed pattern is consistent with each proposition. It is not used for causal identification.

4.2 Measuring Expectation Change

Expectation change is the core mechanism of this paper. It cannot be seen directly, so this paper uses proxy variables. For the expectation about event importance, it measures the frequency of words like "important," "serious," "must punish," "too sad," the emotional intensity of comments, and the use of tags like "hot search" and "explosive." For the expectation about others' actions, it measures the frequency of phrases like "everyone is sharing," "the whole internet is talking," "many people have already followed," and the use of action words like "follow," "share," "spread." A composite index can be formed by adding the importance score and the others' action score.

5. Case Illustration

5.1 Case Selection Criteria

For our case study, we picked the "Fat Cat" incident. We chose this case for three main reasons. First, there is a very clear starting point where a small group of early movers acted first. Second, we can clearly see how other people followed them later. Third, the event has a specific time window, which makes it easier for us to observe the early movers and the followers at different stages. It is important to note that we are using this case to show how the mechanism works, not to prove any direct causal relationships.

5.2 Case Description: The "Fat Cat" Incident

In April 2024, a 21-year-old man nicknamed "Fat Cat" jumped from a bridge in Chongqing and died [5]. Shortly after, his sister posted on social media. She claimed that her brother had been cheated by his girlfriend [5]. She

said the girlfriend took his money and did not really love him.

These posts were the early mover actions. At first, only a small number of users saw them. Many users then began to share the posts.

A large number of users followed. In the end, people wasted 94.6 tons of food [6]. The sister's account gained more than 3 million followers [6].

According to the police report published in May 2024, the girlfriend did not commit fraud, and the two were in a real relationship [5]. The police report also found that the sister had planned the story and bought traffic [5]. Later, her accounts were closed.

5.3 Time Window

We divided this event into four stages. The first stage is the early mover stage (the first 24 hours), where the sister made the first posts and a small number of users shared and commented. Next is the observation stage (day 2 to day 5), when more people started seeing the posts, causing comments and shares to jump up quickly. Then comes the cascade stage (day 6 to day 15), where millions of users followed. Finally, the reversal stage happened after the police report came out. Some people changed their minds, but many still chose to believe the sister's story.

5.4 Definition of Early Movers

In this paper, early movers are defined as users who posted, shared, or commented on the topic within the first 24 hours. The sister's first posts are the starting point. The number of early movers is measured by the number of first posts and first shares. This definition fits the model in Chapter 3, where early movers act first and later users observe them.

5.5 Definition of Following Behaviour

Following behaviour is defined as a user reposting, commenting, or sending food after the first 24 hours. The main outcome variable is whether a user follows or not. The number of followers is measured by the number of reposts, comments, and food deliveries.

5.6 Network Density (Theoretical Discussion)

Network density is difficult to measure without network-edge data. In this paper, network density is kept as a theoretical discussion rather than an empirical test. On a platform like Weibo, density could be measured by the number of mutual follows, replies, and mentions among users who discuss the topic. A dense network means many users are connected to each other, while a loose network means few users are connected. Future research can use real network data to test whether network density moderates the effect of early movers.

5.7 Case Analysis: "Fat Cat" and the Propositions

Proposition 1: Information sensitivity.

The theoretical mechanism is that when information is uncertain, individuals rely more on others' actions to infer the truth, making a cascade more likely. In the case, at the beginning, most users did not know the full truth. They only saw the sister's posts, did not know the girlfriend's response, and did not know the police were investigating. Because information was unclear, people relied more on others' actions. When they saw many people following, they believed the story must be true. This observation is broadly consistent with Proposition 1. However, the case does not directly measure the degree of information uncertainty, so it can only show consistency, not causality.

Proposition 2: Threshold-consistent pattern.

The theoretical mechanism is that after the number of early movers passes a certain critical level, the probability of following rises noticeably, showing a non-linear threshold effect. In the case, at first, only a few users shared the posts, and the effect was small. After the number of shares reached a certain level, the effect became much stronger. More and more users joined, and the cascade grew very fast. This observation is broadly consistent with Proposition 2. But the case has no user-level data, so the threshold position cannot be estimated, and significance cannot be judged. It can only serve as illustrative evidence.

Proposition 3: Expectation change as mediator.

The theoretical mechanism is that an increase in the number of early movers leads later individuals to update their expectations about event importance and others' actions, which further raises the probability of following. In the case, as the early posts spread, users began to think the event was "very important" and that "many people were sharing it," and this change in expectation pushed more people to follow. This observation is broadly consistent with Proposition 3. However, expectation change is inferred indirectly through comments and reports, not measured directly, so it can only serve as illustrative evidence.

Proposition 4: Network density (theoretical discussion).

The theoretical mechanism is that network density may moderate the effect of early movers on following decisions, with different effects under different densities. In the case, Weibo users are closely connected, and information spreads very fast, so the early posts quickly reached a large audience. This may have made the cascade stronger. But the case does not provide network-edge data. It is not possible to calculate density, average degree, or clustering coefficient, so this can only be kept as a theoretical discussion, not a tested result.

5.8 Reversal and Limits of the Case

The reversal is a very crucial part of the "Fat Cat" case. In May 2024, the police published their report [5]. They found no fraud was committed by the girlfriend [5]. The report also revealed that the sister had planned the story and bought traffic [5].

This was a very strong counter-signal. Logically, it should have stopped the cascade. But it didn't stop everyone. Many users still chose to believe the sister's story. This is

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consistent with the idea that once a cascade is formed, it is really hard to reverse. It also suggests that corrective information might be resisted because individuals have already invested their beliefs and emotions in the original story. This is a very important observation, but it goes beyond what our model can explain.

5.9 Summary of Case Illustration

Overall, the "Fat Cat" case is consistent with our main argument. First, a few early movers can indeed change later individuals' expectations. Second, when information is uncertain, cascades are much more likely to happen. Third, there is a clear pattern consistent with a threshold. And fourth, once a cascade forms, it is very hard to reverse, even with a strong counter-signal.

6. Conclusion

6.1 Main Findings

It is also worth noting that this model is built under somewhat ideal conditions. It is a conceptual threshold model, not a full game-theoretic model with complex utility functions, strategies, and equilibrium conditions. We only use global games to explain signal updating.

Also, the case study here is just for illustration, not for strict causal identification. Because we only looked at a single event that already became a cascade, there might be a selection bias on the dependent variable. Besides, measuring expectations is tricky. Comments and reposts are just indirect signs of expectation change; they don't perfectly show what people are actually thinking. And as mentioned before, we didn't test network density with real network data.

6.2 Limitations

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6.3 Future Research

Future research can discuss the applicability of the model in different network structures and information environments. One direction is to compare different platforms. Another direction is to use experiments. A third direction is to collect network-edge data and test the moderating effect of network density. In short, this paper provides a starting point for understanding how a few early movers can change others' expectations and trigger information cascades.

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