

The Effects of Visual Features on Consumer's Click Behavior



A DDM Analysis on Field Data of Short Videos

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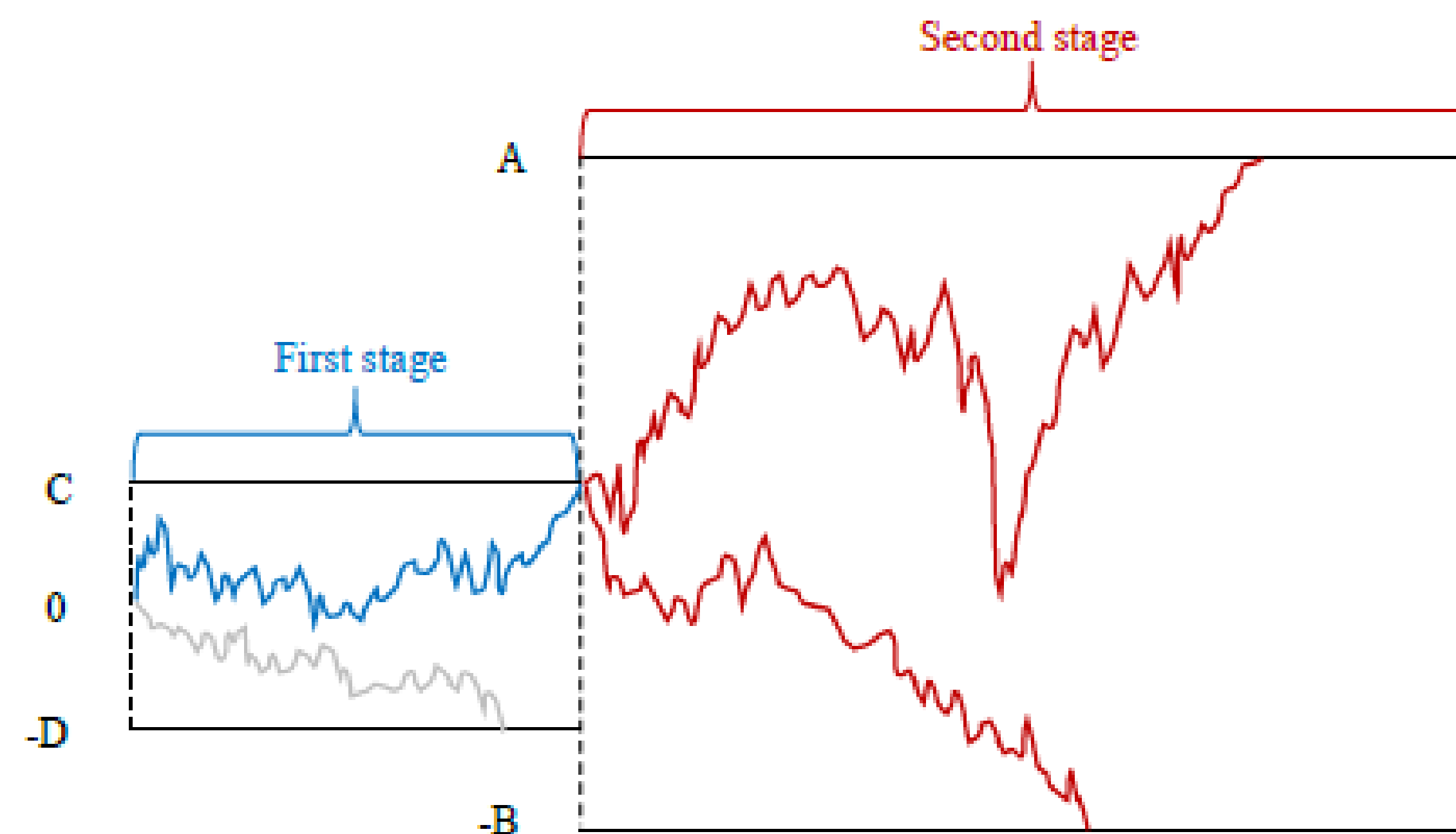
Abstract

This study aims to examine the effects of short videos' visual features on consumers' click behavior and the dynamic mechanism underlying it. Using the field data from Taobao, we find that more saturated, brighter and cooler colors have positive effects on consumer's click behavior. We employ the drift-diffusion model (DDM) that can take the real-time visual features of short videos into account, to model the consumer's dynamic decision-making process when watching short videos. We find that a serial two-stage DDM can capture consumers' behavior and the underlying process well.

Introduction

We employ the drift-diffusion model (DDM), a sequential sampling model from cognitive science, to describe and model the dynamic process underlying consumers' behavior when they watch short videos. The DDM assumes that, when watching short videos, consumers evaluate the content by continuously "sampling" noisy information (or "evidence") about each action's desirability (e.g., click versus exit). The sampling continues until the relative evidence favoring one option over the other reaches a predetermined threshold, and then this option is chosen. Compared to static models (e.g., logistic models), the DDM can take the real-time features into account in the modeling. Specifically, we proposed a serial two-stage DDM to model the dynamic process underlying consumer's behavior when watching short videos. The model assumes that in the first stage, the consumer decides whether to continue watching or exit, and in the second stage the consumer decides between click or exit. If a short video cannot attract consumers to continue watching in the first stage, consumers cannot enter the second stage to comprehend the video content and click on the product.

The Serial Two-stage DDM

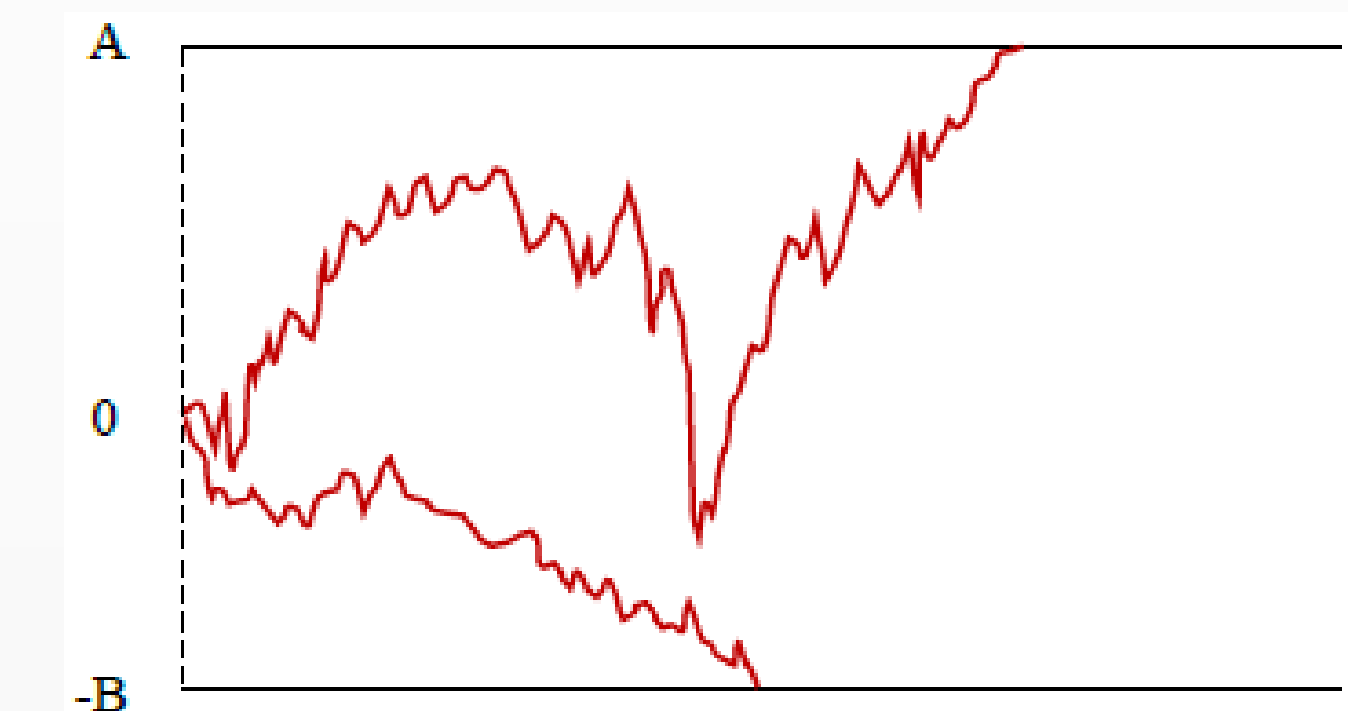


Estimation results of the serial two-stage DDM

Parameter	Mean	95% CI
a	0.4301 (0.1674)	[0.3839, 0.4758]
θ	5.6520 (0.1985)	[5.598, 5.706]
C	1.0033 (0.0043)	[1.002, 1.004]
v_{0_fir}	-0.0763 (0.0077)	[-0.0785, -0.0742]
β_{W_fir}	-0.0040 (0.0016)	[-0.0045, -0.0036]
β_{S_fir}	0.0033 (0.0013)	[0.0030, 0.0037]
β_{B_fir}	0.0041 (0.0006)	[0.0039, 0.0043]
v_{0_sec}	0.1709 (0.0113)	[0.1678, 0.1740]
β_{W_sec}	-0.0063 (0.0022)	[-0.0069, -0.0057]
β_{S_sec}	0.0087 (0.0021)	[0.0081, 0.0093]
β_{B_sec}	0.0024 (0.0010)	[0.0021, 0.0027]
v_c	-0.2314 (0.0034)	[-0.2324, -0.2304]
t_0	1.0467 (0.0724)	[1.027, 1.067]

Model Comparisons

Single-stage DDM



Logistic Regression

Estimation results of the logistic regression

	Coefficient
Warm_Prop_Mean	0.0110 (0.0281)
Saturation_Mean	0.0065 (0.0208)
Brightness_Mean	0.0276* (0.0160)
Video_Length	0.1545*** (0.0469)
Word_Count	-0.0022 (0.0217)
Age	0.0399 (0.0316)
Gender	0.0231 (0.1137)
Purchase_Power	-0.0177 (0.0327)
Activity_Score	0.0122 (0.0122)
Followers	-0.0085 (0.0072)
Price	-0.1589** (0.0702)
Constant	-3.6430*** (0.6116)

Results of Model Comparisons

Model	G^2	Average click-through rate	Mean response time (seconds)
Serial two-stage DDM	42.25	6.43% (1.66%)	30.52 (2.20)
Single-stage DDM	167.75	2.82% (1.95%)	22.98 (9.74)
First variant of the serial two-stage DDM	45.64	7.50% (2.73%)	29.64 (3.08)
Second variant of the serial two-stage DDM	61.46	9.74% (4.97%)	30.00 (2.72)
Parallel two-stage DDM	100.20	10.12% (5.35%)	29.22 (3.50)
Logistic regression	/	0.65% (4.12%)	/

Note: The mean absolute errors are reported in parentheses.