

The analysis of the consequences of product pricing structures on product evaluations

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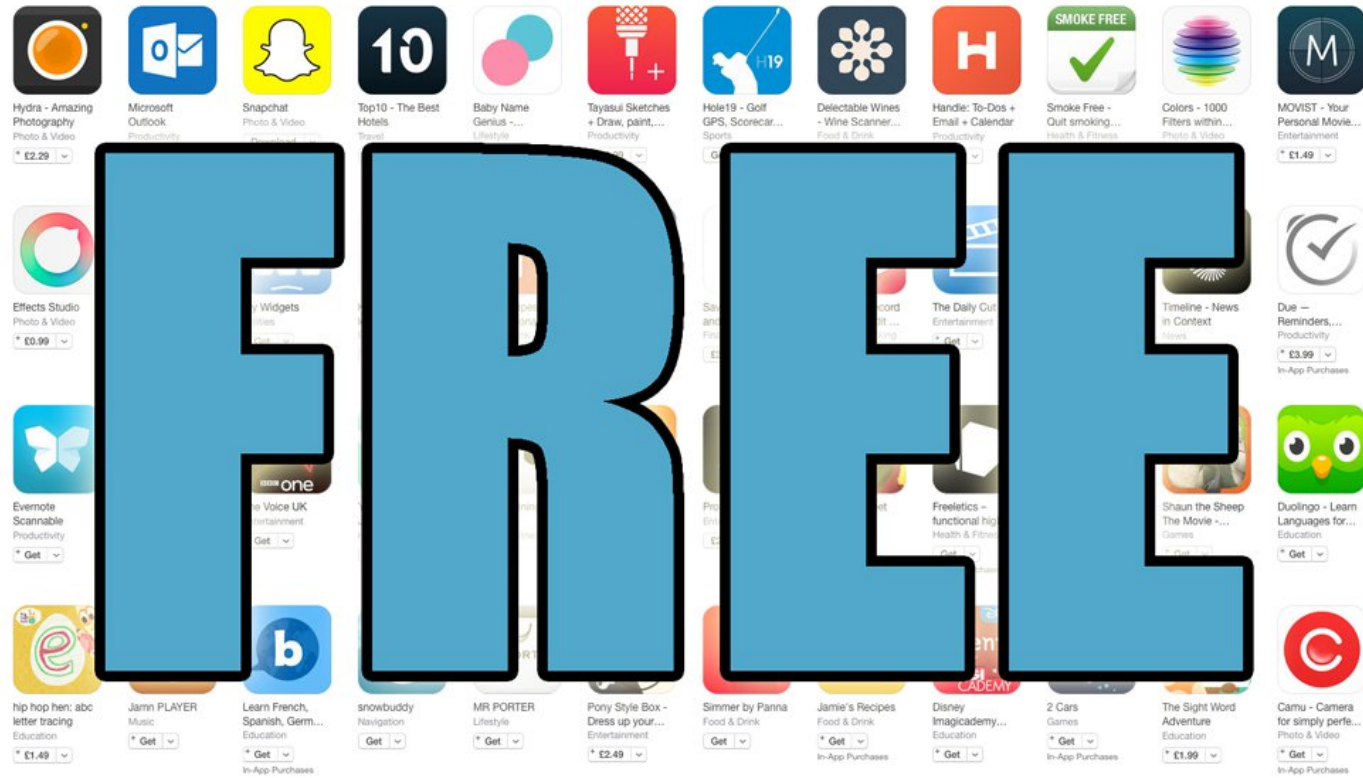


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Research Background



RESEARCH BACKGROUND

300 billion apps have already been downloaded by generating million-dollar revenue streams for companies (Lunden, 2015)

2% of the apps were responsible for more than 54% of all the revenues made (Koetsier, 2014)

Increasing levels of rivalry leads to new ways of attracting payments from consumers (Fields, 2014)

In-app purchases represent 48% of the app store revenue in 2017, while this only was 11% in 2012 (Gartner, 2013)





RESEARCH BACKGROUND

New Currency: Affection (as expressed in online reviews)

Online reviews has been found to significantly affect product performance (Purnawirawan et al., 2015; Situmeang, Leenders, Wijnberg, 2014; King, R. A., Racherla, P., & Bush, V. D., 2014)

No research about the potential effects of the in-app purchases (microtransactions) on the consumer experience

Previous studies of e-WOM were also only focused on the average review score (Purnawirawan et al., 2015; Zhang, Ma, Cartwright, 2013)

What we offer is a method to quantify aspects of consumer reviewing style, i.e. assertiveness, evaluation topics and consumer sentiment from online review texts

HYPOTHESES

Upfront payment causes customers couple the costs and benefits of a product or service at the time of consumption (Prelec and Loewenstein, 1998)

The cost of this transaction at full negative hedonic value *during app purchase* (NewPort, 1991)

Microtransactions in apps create more involved pricing related interaction with consumers (Hienerth et al., 2011)

Free and Freemium app trigger evaluation process *during app consumption*

Hypothesis 1: Less restricted product pricing (Free products) has a positive effect on the frequency of pricing topics mentioned in the review text.

HYPOTHESES

Free and Freemium model do not oblige payment option when customer adopt the product

Endowment effect (Kahneman et al. 1990): The measure of willingness to accept greatly exceed measures to pay

- Theoretically customer value the app higher when they have to pay because they have adopted the product before making any purchase

Referring back to the lack of negative hedonic benefit due to initial payment

H2. Less restrictive product pricing models have a positive effect on the product evaluation sentiment.

H3. Less restrictive product pricing models have a positive effect on the pricing evaluation sentiment.

HYPOTHESES

Fairness is the judgment by an individual about whether the result and/or process towards that results is acceptable, understandable or just (Bolton, Warlop and Alba, 2003)

- Lower performance than a financially similar product can cause consumers to perceive a price as unfair (Martins and Marielza, 1995)

Consumer tend to focus on their self-interest and try to maximize their own outcome, while creating an overall judgement (Oliver and Swan, 1989)

Payment models without an upfront payment barrier could in theory reduce the experienced disadvantaged unfairness

- Lack of initial payment (sacrifice) + I lost the game fair and square → I need more potions

H4. Less restrictive product pricing models has a negative effect on the product evaluation assertiveness.

H5. Less restrictive product pricing models has a negative effect on the pricing evaluation assertiveness.

METHOD

Webcrawling google store: play.google.com

Node.js

- source code available for download, feel free to modify the code.

Top 120 lists of paid and free games

Game title, ranking, price, developer name, ratings and pricing model

23.830.300 reviews

Randomly select 400.000 reviews for testing

5.000 reviews to confirm the test results

METHOD

Pricing model (Dummy variable)

- Free + Freemium = 1 (n=39)
- Premium + Premium+ = 0 (n=81)

Clean, lower case, trim, and remove non ascii characters

Sentiment

- Sentistrength (<http://sentistrength.wlv.ac.uk/>)
- Built-in dictionary for sentiment score based on LIWC

Assertiveness

- The percentage of which the reviewers give extremely negative or positive score (e.g. nonchalant vs hate, or ok vs magnificent*)

Pricing topic identifier

- Appbot.co
- Free cost*, price*, pay*, buy*, bought, spent, spend*, price*, free*, giveaway, worth*, money*, \$, dollar, €, euro, valu*
- Latent Dirichlet Allocation (R library topicmodel), see: <https://www.tidytextmining.com/topicmodeling.html> for step by step manual

Review Score

- Average and Variance Score given by the customers as recorded by Google Play Store

Sales (App install)

- Google data, Natural Log for normalization

RESULTS

			Whole Text			Pricing Topic Only		
			Estimate	S.E.	p	Estimate	S.E.	p
OverallPricing#	<---	Free	2667.099	982.21	**	N/A		
Sentiment	<---	Free	7.227	1.650	***	.205	.087	*
Sentiment	<---	Everyone	1.022	1.647		.137	.087	
Sentiment	<---	Action	-1.750	2.546		.041	.135	
Assertiveness	<---	Free	-2.382	.370	***	-1.531	.568	***
Assertiveness	<---	Everyone	.646	.300	*	.191	.569	
Assertiveness	<---	Action	-.258	.574		-.010	.879	
ReviewScore	<---	OverallPricing#	.001	.000	***	N/A		
ReviewScore	<---	Sentiment	.030	.003	***	.552	.043	***
ReviewScore	<---	Assertiveness	.002	.012		.006	.007	
ReviewScore	<---	Free	-.156	.046	***	-.156	.041	***
ReviewScore	<---	Action	.023	.061		.068	.061	
ReviewScore	<---	Everyone	-.015	.040		-.073	.040	
Variance	<---	OverallPricing#	.000	.000		N/A		
Variance	<---	Sentiment	-.063	.005	***	-1.133	.077	***
Variance	<---	Assertiveness	-.061	.024	**	-.028	.012	*
Variance	<---	Free	.320	.091	***	.217	.073	***
Variance	<---	Action	-.054	.120		.147	.108	
Variance	<---	Everyone	-.072	.079		.013	.071	
Ln(Sales)	<---	Variance	-.537	.227	*	-.566	.231	*
Ln(Sales)	<---	ReviewScore	.901	.432	*	.984	.437	*
Ln(Sales)	<---	Action	.040	.142		.008	.144	
Ln(Sales)	<---	Everyone	.222	.094	*	.195	.095	*
Ln(Sales)	<---	OverallPricing#	.000	.000	*	N/A		
RMSEA			0.021			0.023		
CFI			0.988			0.984		

Discussion

Empirical evidence to the effect of pricing strategy options on consumer review sentiment, assertiveness and topics.

- Confirmation of theory that for premium product, consumers see this as a negative hedonic value and result into negative overall sentiment
- Freemium eliminates the effect of sunk cost -> more positive overall sentiment

Free(-mium) strategy makes the customer more involved with regard to pricing (more reviews with pricing as topic)

Free(-mium) strategy makes the customer more positive (but also less assertive) in their reviews

Limitations and Future Research

Limited API capacity to code topics from review texts

- Limited number of app that can be analyzed

Dataset from Google Store only in Games Category

- Other industry?

Restricted to existing dictionaries based on English language

- Other culture?

Aggregate cross-sectional data

- Multilevel+unbalanced path model?
- Temporal effect
 - Tried but no significant results

QnA
