COMMERCIALIZING TECHNOLOGICAL INNOVATIONS
We model the diffusion of innovations in markets with two segments: influentials who are more in touch with new developments and who affect another segment of imitators whose own adoptions do not affect the influentials. This two-segment structure with asymmetric influence is consistent with several theories in sociology and diffusion research, as well as many “viral” or “network” marketing strategies. We have four main results. (1) Diffusion in a mixture of influentials and imitators can exhibit a dip or “chasm” between the early and later parts of the diffusion curve. (2) The proportion of adoptions stemming from influentials need not decrease monotonically, but may first decrease and then increase. (3) Erroneously specifying a mixed-influence model to a mixture process where influentials act independently from each other can generate systematic changes in the parameter values reported in earlier research. (4) Empirical analysis of 33 different data series indicates that the two-segment model fits better than the standard mixed-influence, the Gamma/Shifted Gompertz, and the Weibull-Gamma models, especially in cases where a two-segment structure is likely to exist. Also, the two-segment model fits about as well as the Karmeshu-Goswami mixed-influence model, in which the coefficients of innovation and imitation vary across potential adopters in a continuous fashion.
A THEORY OF COMBATIVE ADVERTISING

In mature markets with competing firms, a common role for advertising is to shift consumer preferences towards the advertiser in a tug-of-war, with no effect on category demand. In this paper, we analyze the effect of such “combative” advertising on market power. We show that, depending on the nature of consumer response, combative advertising can reduce price competition to benefit competing firms. However, it can also lead to a procompetitive outcome where individual firms advertise to increase their own profitability, but collectively become worse off. This is because combative advertising can intensify price competition such that an “advertising war” leads to a “price war.” Similar to price competition, advertising competition can result in a prisoner’s dilemma where all competing firms make less profit even when the effect of each firm’s advertising is to enhance consumer preferences in its favor. Given such procompetitive effects, we further show that cost of combative advertising could be a blessing in disguise—higher unit cost of advertising resulting in lower equilibrium levels of advertising, leading to higher prices and profits. We conduct a laboratory experiment to investigate how combative advertising by competing brands influences consumer preferences. Our experimental analysis offers strong support for our conclusions.
In this paper we study product line scope and pricing decisions in a horizontally differentiated duopoly. Past research has shown that a firm may offer a broader product line to attract higher demand or charge a higher price (or both), and benefit at the expense of its competitor. We show that such outcomes may be reversed, especially when consumers have relatively high valuation and low heterogeneity in their preferences for the line extension. We find that an equilibrium exists such that only one firm prefers to expand scope but profits may be higher for both firms, even in the absence of market size expansion. This is because a broader scope permits that firm to effectively price discriminate by raising prices for its core customers. The competitor optimally responds by lowering prices to gain share and earn a higher profit. Thus, higher prices for the firm expanding its product line translate into higher demand for the competing firm, thus increasing profit for both. We show that our results hold when firms deploy generic, offensive or defensive strategies during product line expansion.
Disclaimer: The intent of this discussion is to illustrate one observed instance of potential market reactions to the introduction of a new product. No intended or unintended endorsements or generalizations for this or any other product or service or subsequent versions of this or any other product and service are implied.
mid 1990s

iBOT

Watching someone in a wheelchair struggling to get up onto a curb made us realize that it was time for the wheelchair to be completely reinvented. The iBOT gives disabled persons the ability to navigate any terrain and approach life with a new sense of dignity. The iBOT’s self-balancing technology allows the user to go up and down staircases, navigate difficult terrain and “stand” at eye level with the ambulatory people around them.
BUILDING THE HUMAN TRANSPORTER

- compact, reliable, high-power motors
- independently driven wheels and transmission
- sophisticated control system
- compact, aviation-grade rotation sensing instruments for gyroscopic stabilization
- mechanical integrity and robustness
-...

A TECHNICAL MARVEL
... every invention is a response to a problem ...

... but the problem he wanted to solve -- the need for a clean, energy efficient vehicle that could coexist with pedestrians and replace the car in the world's cities -- was one that others didn't see...

... the hardest part might not be envisioning what can be invented, but determining what will be needed ...

... there's an awful lot of amazing technology in the personal transporter

... still, when it comes to clean, inexpensive, one-person transportation, for many people a bike does just fine.
"Our lesson learned is that it's easier coming up with innovative tech than it is to change people's behavior."

... convincing consumers to stop walking or biking and switch to something entirely new was the real challenge ...

... first, the company hoped the device would appeal to urban commuters

... when it became clear that it didn't, the company began to reconsider sales, marketing, support, and distribution ...

... last two years, Segway began targeting police and security guards ...
THREE CLASSIC PITFALLS

- failure to account for “typical” innovation adoption rates
- inappropriate “go-to-market” strategies
- violation of “customer centric innovation” principles
PITFALL 1

OVERESTIMATING THE RATE OF INNOVATION ADOPTION

Adoption Rates of Various Communication Technologies

INNOVATION ADOPTION

INNOVATIVE TECHNOLOGY CAN RUN INTO TECHNICAL SETBACKS

Recalls
Recall notice
*click here to register for the software upgrade

For Immediate Release
Originally issued September 14, 2006
Release #06-258

Segway Inc. Announces Recall to Repair Segway® Personal Transporters

Note: Consumer Contact change.
WASHINGTON, D.C. – The U.S. Consumer Product Safety Commission, in cooperation with the firm named below, today announced a voluntary recall of the following consumer product. Consumers should stop using recalled products immediately unless otherwise instructed. (To access color photos of the following recalled products, see CPSC’s Web site at www.cpsc.gov.)

Name of Product: Segway Personal Transporter (PT) also known as Segway Human Transporter (HT)

Units: About 23,500

Manufacturer: Segway Inc., of Bedford, N.H.

Hazard: The personal transporter can unexpectedly apply reverse torque to the wheels, which can cause a rider to fall. This can occur when the device is tilted back by the Speed Limiter and the rider comes off and then back onto the device within a short period of time.

Incidents/Injuries: Segway Inc. has received six reports of the personal transporter not operating properly, resulting in injuries to the head and wrist of users.

Description: This recall involves all Segway PT i167, i170 and i180 (‘i Series’ models, the p133 (‘p Series’), XT (‘cross-terrain transporter’), GT (‘golf transporter’) and i2 models. These units were sold to consumers and commercial customers. All e167 (‘e Series’ models, which were sold to commercial users, also are included in this recall. No other models are involved in this recall. The name, “Segway”, appears on the front bumper and/or on the handlebars of the personal transporter.

reverse torque, if quickly get off and back on
PITFALL 2: GO-TO-MARKET STRATEGY

WHEN TO “SWING FOR THE FENCE”?

High Opportunity
Cost of Delay

Low Opportunity
Cost of Delay

How costly would it be to wait?

Can we immediately learn from investing in market research?

Uncertainty high for some time, regardless of investment

Uncertainty

investment

Uncertainty can be reduced substantially with modest investment

investment
GO-TO-MARKET STRATEGY

How costly would it be to wait?

- High Opportunity Cost of Delay
  - Go for it! "swing for the fence"
  - Adopt a dynamic, contingent-action approach...stages with decision points.

- Low Opportunity Cost of Delay
  - Wait and see... possibly as second mover.
  - Take slow, deliberate, and careful steps to reduce uncertainty.

Can we immediately learn from investing in market research?

Uncertainty high for some time, regardless of investment

Uncertainty can be reduced substantially with modest investment

Segway
PITFALL 3: CUSTOMER CENTRIC VS FIRM CENTRIC INNOVATION

VIOLATION OF “CUSTOMER CENTRIC INNOVATION” PRINCIPLES

▸ WHAT is the customer’s need for the innovation?

not

▸ HOW we wish to push a particular technology that we have on the market …
IF WE BEGIN WITH THE HOW ...

... WE RISK ADDRESSING A NEED FOR WHICH LOWER-COST, HIGHER-PERFORMANCE SOLUTIONS ALREADY EXIST!
WHEN MIGHT A TECHNOLOGY-PUSH WORK?

- **Materials** – when material properties essential in certain applications
- **Pharmaceuticals** – often, no other alternative!
- **Technologies with simple “functions”** – likely multiple applications for it

... stumble upon “latent” need ... & is the best available solution
COMMERCIALIZING TECHNOLOGICAL INNOVATIONS

- plan for realistic growth: allow for incubation period
- often, opportunity cost of time overestimated
  - ...can take it slower
- assume we could be wrong about many things
  - ...including which market segments adopt, why

- “customer centric innovation” principles often help:
  - what, not how
Yogesh Joshi is associate professor at the Robert H. Smith School of Business at the University of Maryland. He has a background in both engineering and business - he studied mechanical engineering at MIT and has a PhD in marketing from the Wharton School of the University of Pennsylvania. His industry experience includes work as a strategy consultant at McKinsey and Company.

His research focuses on strategic marketing decisions, innovation diffusion, product differentiation, brand strategy, and new product development. His research has been published in the leading academic business journals such as Marketing Science, Management Science, and the Journal of Marketing Research; and he has been recognized for his work by the Marketing Science Institute as a Young Scholar. In 2015, the MBA students voted for him as the "Most Effective Professor" at Smith for his MBA elective course on Innovation and Product Development. He works with companies as well as entrepreneurs in the DC region on various topics related to innovation, design, marketing and strategy.

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