



Marketing Science

Publication details, including instructions for authors and subscription information:
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To cite this article:

Raghuram Iyengar, Christophe Van den Bulte, Thomas W. Valente, (2011) Rejoinder—Further Reflections on Studying Social Influence in New Product Diffusion. Marketing Science 30(2):230-232. <https://doi.org/10.1287/mksc.1100.0614>

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Rejoinder

Further Reflections on Studying Social Influence in New Product Diffusion

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Building on the commentaries on our work, we make additional suggestions for future research on social contagion and new product diffusion. In particular, we note that social contagion may occur for many reasons and that investigating how various personal or group characteristics moderate the amount of influence some customers exert or the extent to which others are sensitive to potential influence can provide insights into the social mechanism(s) at work.

Key words: diffusion of innovations; opinion leadership; social contagion; social networks

History: Received: August 28, 2010; accepted: September 1, 2010; Eitan Muller served as the guest editor-in-chief and Arvind Rangaswamy served as associate editor for this article. Published online in *Articles in Advance* December 10, 2010.

We much appreciate the thoughtful commentaries by Aral (2011), Christakis and Fowler (2011), and Godes (2011), and we believe that they will be quite useful in guiding future research efforts in our field. As the discussants largely endorse our study (Iyengar et al. 2011) and make several excellent suggestions on what to do next, we provide some additional thoughts on future research. Before doing so, however, we want to address some possible confusion.

1. Contagion as an Unassailable Premise

We opened our paper by noting that the rationale of many network marketing strategies rests on three key assumptions, the first being that social contagion is at work, and then claimed that managers would be remiss to simply take those assumptions for granted. The commentary by Godes questions whether there truly is a sizable segment of the academic community that would argue that contagion does not exist. Taking the answer to be negative, he posits that testing the hypothesis whether contagion exists is neither appropriate nor consistent with the scientific method.

Although we see no harm in accepting the notion that contagion has been shown to exist, and we agree with Godes (2011, p. 225) that “there are far deeper, richer, and more impactful questions that could be addressed,” we are afraid that his position might be interpreted as a license to simply assume contagion is

at work in each and every instance. This, we believe, would be dangerous for managers accountable for the success of a particular product among a particular customer group. It would also be counterproductive for researchers. Using the assumption that contagion is at work as an unassailable premise that must not be questioned, part of what Lakatos (1970) called the “hard core” of a scientific research programme, would turn us away from asking questions about contingencies like “when does contagion (not) matter,” which Godes himself advocates. Having clarified this issue, we now provide additional thoughts on some questions that cut across the three commentaries.

2. Surveys vs. Massive/Passive Data

As the number of field studies into word of mouth and other contagion phenomena operating over social networks grows, the challenges in obtaining good network data become increasingly clear. Many studies use network surveys to collect data on ties between network members. The main benefit is that one can tailor the questions such that they capture the type of tie that is of theoretical interest or of substantive relevance to the phenomenon being investigated. For example, researchers analyzing the spread of college savings plans can ask parents specifically who they turn to for advice on financial matters. Network surveys, however, have drawbacks as well, the most important being the cost of administration, imperfect

response rates, and imperfect accuracy of responses (Borgatti et al. 2009, Van den Bulte 2010). Although several techniques have been developed to limit the latter problem, costly administration and incomplete response explain why researchers sometimes turn to alternative data sources.

Several recent contagion studies have used data of interaction through electronic media, such as telephone calls, e-mails, or “friendship” ties and home page visits in social networking sites. This type of automatically recorded “massive/passive” data is cheap to collect for the entire set of network members, but the validity and relevancy of the data hinge on whether the electronic interaction being traced is an informative measure of the social ties acting as conduits of social contagion. That assumption need not hold, given recent findings by Trusov et al. (2010), that about 80% of “friendship” ties in a major social networking site had no detectable contagion effect on site usage, and by Huberman et al. (2009), that most of the links declared within Twitter are meaningless from an interaction point of view.

Unless the massive/passive data reflect network ties that are clearly relevant to the phenomenon of interest, researchers have to trade off data richness against data completeness. How to make that trade-off should depend on what one cares about. For instance, incomplete unit response to a network survey means that one can accurately capture the influence from nodes with direct ties only. Thus, incomplete unit response does not create measurement problems if one believes that people are influenced by their direct contacts through social learning or attitudinal consistency processes. Incomplete unit response, however, is problematic if one believes that contagion is driven by competition for status among positionally equivalent peers or by exposure to the behavior of peers of peers, possibilities discussed by Aral. As another example, having response rates lower than 20% implies that indegree may not be a valid measure of status or opinion leadership (Costenbader and Valente 2003). That will be problematic only if those concepts are central to one’s investigation and one does not have an alternative measure, such as citation counts among scientists.

Finally, marketing scholars should note that experts who have used massive data sets in their own work (e.g., Aral et al. 2009, Christakis and Fowler 2007) explicitly endorse the use of smaller studies like ours, provided they are well motivated and carefully conducted. Simplistic small-is-always-bad arguments have no place in sound scientific debate and practice.

3. Experimental vs. Observational Designs

Because getting good observational network data can be difficult, researchers should consider using

experimental data. Besides being sometimes easier to obtain, data on experimentally manipulated networks also help circumvent the triple threat of omitted variables, simultaneity in cyclic networks, and homophily or endogenous tie formation, as Aral as well as Christakis and Fowler note. Experimental and observational network data often have complementary strengths and weaknesses, and network and contagion research in marketing would benefit from both types of work capitalizing on each other.

Experimental designs can also help us learn about the effectiveness of different network campaigns and intervention strategies. Studies have been conducted using a variety of network interventions, but the field remains in its infancy (Valente 2010). This is a great opportunity for research in marketing, as all three commentaries point out.

4. Contingencies in Social Influence

Marketers and social scientists have long tried to profile opinion leaders. This is of great practical importance as such influentials should be effective seeding points for contagion-based marketing campaigns. As the commentaries note, our findings that (i) self-reported and sociometric leadership are only weakly correlated and (ii) heavy users are more influential than light users open several new avenues of inquiry. Further research into the role and characteristics of opinion leaders may not only be of practical value but also provide novel insights into the social influence mechanism(s) at work. Both Aral and Godes make several very good specific suggestions in that regard, including a call not to neglect theory building.

Godes also raises the question of how to motivate people, especially opinion leaders, to actually promote and otherwise support a particular innovation. Additional ways to leverage social contagion more effectively may involve crafting more buzzworthy messages, identifying the kinds of ties that are more likely to be activated, and creating situations bringing potential influentials and influencees together (Valente and Davis 1999, Van den Bulte 2010). The effectiveness of these actions will become increasingly important as marketers’ attention moves from spontaneous or organic word of mouth to stimulated or even paid-for word of mouth (e.g., Godes and Mayzlin 2009, Schmitt et al. 2011).

On that note, how effective are “viral-for-hire” services that artificially create buzz for payment (in cash, free product samples, or coupons) compared to spontaneous word of mouth? Does the answer vary in the long versus short term (Van den Bulte 2010)? Does paid-for word of mouth die out faster than spontaneous word of mouth, because the word-of-mouth mercenaries move on to touting the next product once

the campaign has been terminated? Conversely, can paid-for word-of-mouth campaigns be used to rejuvenate and re-energize the buzz once the naturally occurring word of mouth has lost momentum? Might it be optimal to use pulsing in word-of-mouth marketing?

5. Contingencies in Susceptibility to Social Influence

All three commentaries point to our evidence about differences in the susceptibility to social influence as a notable contribution of our work. Additional research on such contingencies could be of both practical and theoretical value.

As Christakis and Fowler note, a successful marketing campaign can benefit greatly from identifying not only who is influential but also who is influenceable. Whereas Watts and Dodds (2007) have expressed some skepticism about the feasibility of identifying influentials, their work supports efforts focusing on identifying influenceables. Our finding that outdegree (number of nominations given) and lack of self-reported opinion leadership are weakly correlated implies that marketers cannot simply rely on people's self-reports to identify influenceables, though we do not believe that the weak correlation necessarily implies the need to map the whole network as Christakis and Fowler propose.

Differences in the susceptibility to social influence can also shed light on the nature of the contagion mechanism that, as Aral notes, is a fundamental issue that needs careful consideration. Contagion may occur for many reasons, including a lack of awareness through traditional marketing efforts, uncertainty about the product's risks and benefits, social-normative considerations, social identity considerations, competitive considerations, or installed base effects. Systematically investigating how various personal or group characteristics moderate the amount of social influence in one's behavior is one route to shed light on the social mechanism(s) at work (e.g., Van den Bulte and Stremersch 2004). Temporal variations can also be informative, especially if they can be related to exogenous events that unambiguously map into a specific contagion mechanism (e.g., Nair et al. 2010).

Aral discusses how contingencies involving the nature of the ties may also shed light on the nature of the influence mechanism at work. Some additional mappings between various mechanisms and the kind of ties they operate through are touched upon by Van den Bulte and Wuyts (2007, pp. 44–45).

As Godes notes, the susceptibility to social influence likely also differs across stages of the adoption decision process. Both the nature of the product and the way it is marketed probably affect at what stage(s) social influence is most effective. These contingencies warrant more research and provide yet another

opportunity to gain a deeper understanding of social influence, its mechanisms, and the implications for effective marketing practice.

References

- Aral, S. 2011. Identifying social influence: A comment on opinion leadership and social contagion in new product diffusion. *Marketing Sci.* 30(2) 217–223.
- Aral, S., L. Muchnik, A. Sundararajan. 2009. Distinguishing influence-based contagion from homophily-driven diffusion in dynamic networks. *Proc. Natl. Acad. Sci. USA* 106(51) 21544–21549.
- Borgatti, S. P., A. Mehra, D. J. Brass, G. Labianca. 2009. Network analysis in the social sciences. *Science* 323(5916) 892–895.
- Christakis, N. A., J. H. Fowler. 2007. The spread of obesity in a large social network over 32 years. *New Engl. J. Med.* 357(4) 370–379.
- Christakis, N. A., J. H. Fowler. 2011. Contagion in prescribing behavior among networks of doctors. *Marketing Sci.* 30(2) 213–216.
- Costenbader, E., T. W. Valente. 2003. The stability of centrality measures when networks are sampled. *Soc. Networks* 25(4) 282–307.
- Godes, D. 2011. Invited comment on "Opinion leadership and social contagion in new product diffusion." *Marketing Sci.* 30(2) 224–229.
- Godes, D., D. Mayzlin. 2009. Firm-created word-of-mouth communication: Evidence from a field test. *Marketing Sci.* 28(4) 721–739.
- Huberman, B. A., D. M. Romero, F. Wu. 2009. Social networks that matter: Twitter under the microscope. *First Monday* 14(1), <http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/2317/2063>.
- Iyengar, R., C. Van den Bulte, T. W. Valente. 2011. Opinion leadership and social contagion in new product diffusion. *Marketing Sci.* 30(2) 195–212.
- Lakatos, I. 1970. Falsification and the methodology of scientific research programmes. I. Lakatos, A. Musgrave, eds. *Criticism and the Growth of Knowledge*. Cambridge University Press, Cambridge, UK, 91–196.
- Nair, H. S., P. Manchanda, T. Bhatia. 2010. Asymmetric social interactions in physician prescription behavior: The role of opinion leaders. *J. Marketing Res.* 47(5) 883–895.
- Schmitt, P., B. Skiera, C. Van den Bulte. 2011. Referral programs and customer value. *J. Marketing*. Forthcoming.
- Trusov, M., A. Bodapati, R. E. Bucklin. 2010. Determining influential users in Internet social networks. *J. Marketing Res.* 47(4) 643–658.
- Valente, T. W. 2010. *Social Networks and Health: Models, Methods, and Applications*. Oxford University Press, New York.
- Valente, T. W., R. L. Davis. 1999. Accelerating the diffusion of innovations using opinion leaders. *Ann. Amer. Acad. Political Soc. Sci.* 566(1) 55–67.
- Van den Bulte, C. 2010. Opportunities and challenges in studying customer networks. S. Wuyts, M. G. Dekimpe, E. Gijbrechts, R. Pieters, eds. *The Connected Customer: The Changing Nature of Consumer and Business Markets*. Routledge, New York, 7–35.
- Van den Bulte, C., S. Stremersch. 2004. Social contagion and income heterogeneity in new product diffusion: A meta-analytic test. *Marketing Sci.* 23(4) 530–544.
- Van den Bulte, C., S. Wuyts. 2007. *Social Networks and Marketing*. Marketing Science Institute, Cambridge, MA.
- Watts, D. J., P. S. Dodds. 2007. Influentials, networks, and public opinion formation. *J. Consumer Res.* 34(4) 441–458.