

## Reply to Bentley and Ormerod: Key considerations in studying cultural abandonment by using baby names

In their letter, Bentley and Ormerod (1) argue that established diffusion models based on the saturation of the pool of potential adopters “explains” the adoption and abandonment pattern that we observed (2). As evidence for this argument, they suggest that established models fit the data well. On this basis, they claim that our finding that adoption velocity has a positive effect on abandonment is “unsurprising” (1).

This claim is unwarranted, however, because a key assumption of saturation models such as the one Bentley and Ormerod use (see Eq. 1 in ref. 1, and see ref. 3 more generally) is inconsistent with the baby-name setting we investigated (2). Saturation models assume that there is a constant and exogenously determined diffusion ceiling (i.e., the number of people who are ultimately going to be adopters). This constant ceiling is enough to guarantee that the per-period number of adopters decays after some time because the number of remaining potential adopters (or risk set) declines as the item gets adopted. Importantly, however, no such ceiling exists in the naming context because the set of potential adopters is continuously renewed (as discussed in ref. 2). The fact that names die out even when the risk set of potential adopters does not decline substantially over time suggests that some other factor must explain abandonment in this setting. We focused on the speed of adoption, and both historical data and survey results suggest adoption speed plays an important role in explaining cultural abandonment.

It is also worth noting that rather than just curve fitting, our perspective (2) attempts to deepen understanding around why cultural tastes die out (also see ref. 4). Many distinct processes can lead to traditional diffusion curves (5, 6), and so showing that such curves fit the data does not provide much

explanatory value. Instead, we focused on a specific mechanism that might drive cultural abandonment and provided consistent evidence from two distinct studies.

Finally, it is important to be clear about what was actually stated in our PNAS article (2). At no point did we argue that our result “negates traditional diffusion models ‘driven by saturation of a pool of potential adopters,’” as Bentley and Ormerod (1) argue. Although the fixed diffusion ceiling assumption is inconsistent with our empirical setting, the fact that adoption speed seems to drive abandonment in this setting suggests it may also help explain abandonment in other settings where this assumption does hold. Though saturation may certainly be important in those settings, concerns about an item’s longevity resulting from fast adoption might act as a complementary factor. Faster adoption should then speed abandonment beyond what is explained by the saturation of the pool of adopters. One way to test the effect of adoption velocity in such settings would be to use a traditional saturation model (e.g., ref. 3) as the null model and examine whether an effect of adoption speed remains.

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