NBER WORKING PAPER SERIES

LEARNING MILLENNIAL-STYLE

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Working Paper 20268
http://www.nber.org/papers/w20268

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
June 2014

The authors thank Shlomo Bernartzi, Bhagwan Chowdry, Craig Fox, and Suzanne Shu for their insightful comments at the start of this project. The authors are indebted to Britt Benston at UCLA for his generosity and help in producing our videos. Any errors are the authors'. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

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NBER Working Paper No. 20268
June 2014
JEL No. A20,G00,I21

ABSTRACT

The growing use of on-line educational content and related video services has changed the way people access education, share knowledge, and possibly make life decisions. In this paper, we characterize how video content affects individual decision-making and willingness to share in the context of a personal financial decision. Content geared toward giving better instructions leads to better financial decisions, but less information sharing. Misleading advertising not only causes worse decisions, but makes it less likely that videos with useful content get shared in the market. This implies that the effects of deception have externalities on other peoples' literacy and decision-making. Our work has important implications for policies guiding financial literacy training, and also has broader impact for education in the information age.

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1. Introduction

Demand for on-line educational content and related video services has exploded over the last few years, suggesting that we are experiencing a global paradigm shift in the way people access education, share knowledge, and possibly make decisions. According to You Tube, over one billion unique users access their content every month[1] and the views of educational content have nearly doubled from 2011 to 2013 [2]. More U.S. adults 18-34 access YouTube than any cable network (Nielsen ratings), and its impact is growing as people of all ages are adopting this form of learning.

What makes this education channel particularly powerful is its information sharing capabilities. Helpful information can be used and then easily shared[3], which potentiates the effects of directed education. Especially considering the growth of Facebook and Twitter, this outlet is a potentially useful channel to influence the literacy and decision-making of our population. In the best case scenario, useful content goes viral and distributes itself. This is not only interesting for academics, but is an opportunity for policy makers to improve the decisions that people make. Regrettably, though, studying the interplay between sharing media and taking the action advocated by that media has been largely overlooked by both[4].

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[1] According to You Tube, six million hours of video content are watched per month and one hundred hours of new video content is uploaded to the website every minute.

[2] Specifically, from 2011 to 2013, views of educational videos on You Tube increased by 99% in the United States. In the summer of 2013, people spent over 142 million hours watching educational content, which was a 100% increase over the summer of 2012.

[3]Indeed, according the You Tube, every auto-tweet resulted in at least six new You Tube browsing sessions.

[4]For example, while there has been considerable recent work that has examined the factors that influence sharing (e.g., Berger 2011; Berger and Milkman 2012; Chen and Berger 2013) and the effects of social media on sales (e.g., Stephen and Galak 2012), there has been little to study the interplay between the two.

In this paper, we investigate how video content affects individual decision-making and willingness to share, and how its efficacy is impacted by other sources of competing information. We study this in the context of a personal financial decision, while keeping in mind that the lessons from our work likely apply to other life decisions. Addressing poor financial literacy is clearly a first order concern (e.g., Carlin and Robinson, 2012), but efforts to ameliorate this problem have not taken advantage of millennial-style learning. Indeed, it appears that "just in time" financial education may be superior to traditional channels (Fernandes, Lynch, and Netemeyer, 2014), videos can enhance financial literacy (Heinberg et al., 2014), and vicarious learning through entertainment can be quite effective (Berg & Zia 2013).

We began by producing our own video, which is a cartoon in which a TV viewer uses a "magic remote" to uncover hidden messages while watching a credit card commercial[5]. Instead of cherry-picking videos that already existed on You Tube, we made this investment so that we could control the content of the video and produce variation by creating several versions that differed in particular ways. Moreover, doing so removed the concern that subjects could have previously viewed our videos before participating in our experiments.

All versions of the video contained three main messages: 1) beware of credit card fees; 2) interest rates may not be fixed; 3) the credit limits may not be specified, but do exist. When we created the videos, we added elements from Heath and Heath (2007) to maximize the probability that people would share our video. As such, the videos were meant to be simple, humorous, engaging, concrete, and tell a story. Before conducting our main experiment, we pilot-tested the videos and confirmed them to be perceived by subjects to be sharable, enjoyable, and useful.

[5] The video may be viewed at http://player.vimeo.com/video/70597491. The password is "remote". Please do not download, post, or share the video.

In our main experiment, subjects first viewed a version of the video and subsequently were asked to choose one of four credit cards from an on-line offering. One of the credit cards was in fact the optimal choice, based on its interest rate, fees, and credit limit. All four credit cards were presented on a single page, with links to key pricing and terms. As such, we could also keep track of how much time subjects spent analyzing prices and how many clicks they made before making a choice. Following the credit card choice, subjects were asked whether they wished to share the video with others (Berger, 2011) and were asked to rate the video on several dimensions based on how the subject felt (Olney, Holbrook, and Batra, 1991). Finally, we collected demographic data on the subjects.

The study used a 2x2 between-subject design. Subjects were randomized between viewing our baseline video and our treatment video, which was the baseline video plus an additional tag that included both a summary of the three main messages and a segment that explained where to locate these pieces of information on a typical credit card. Subjects were also randomized based on whether the credit card page included deceptive advertising or not. Deceptive advertising was communicated by labeling the credit cards with misleading statements such as “low APR” or “low fees” when there were other cards available with lower APR or fees. Subjects who were not treated with deceptive advertising did not view labels at all on their credit card offerings.

Not surprisingly, viewing the tagged video increased the choice of the best credit card. In contrast, deceptive advertising led to less time spent in making the decision and worse choices. These results are what we would have expected ex ante, and if anything confirm that subjects appeared to understand their tasks and take the study seriously. In addition to these effects on choice and amount of attention, there were important differences in relative focus of attention.

The tagged video increased the focus on the optimal card whereas the misleading ads reduced that focus.

Just as importantly, subjects perceived the tagged video as less sharable than the base video, even though the tagged video aided decisions and was considered to be more useful and more effective. Indeed, adding the tag increased the likelihood that subjects would apply for a credit card in the future. Also, the tagged video was able to counteract the negative effect that deceptive advertising had on credit card choice. Notwithstanding this, however, the base video was perceived as more unique and more likely to be shared, even though it was perceived as less useful, did not assist people as much, and was less able to counteract the adverse effects of deception.

Along the same lines, there was an interaction between deceptive advertising and the type of video that a subject watched. The tagged video was perceived to be more useful when no advertising was present than when there was deceptive advertising. This underscores an important implication: deceptive advertising not only leads to worse financial decisions, but also has the potential to decrease the percolation of "good" information in the marketplace.

One caveat to this, though, is a sub-analysis that we performed with regard to whether people chose the correct credit card when exposed to deceptive advertising. For people who chose correctly, the presence of deceptive advertising actually increased the tendency to share information. Participants who made good decisions found sharable value in the added content of the tagged video. However, for those who chose incorrectly, deceptive advertising did not increase sharing and obviated the efficacy of the tagged video.

Finally, we analyzed how these influences were moderated by demographics. Many of the effects we have described hold over a wide variety of individuals, and the significant

moderators that did emerge were of magnitude rather than sign. The tagged video tended to be most effective for men, for younger participants, and for participants with greater than minimal income (i.e., those earning more than $25,000 per year). Female subjects in our study were the most susceptible to deceptive practices as the tagged video was not successful in counteracting the adverse effects of deception.

Based on this, our study yields several novel insights. First, online videos do have the potential to increase the quality of household financial decisions, but merely presenting the information in an engaging sticky format is not sufficient. The information must be interpretable and implementable in order to direct attention appropriately. Second, effective does not necessarily mean sharable. In our study, the more effective video was marginally less likely to be shared. In fact, had it not been perceived to be more effective, it would have been considerably less likely to be shared than the baseline video.

Third, the perceived effectiveness, and the impact of actual effectiveness, depend on the choice context. Consumers found our implemental video to be more effective than our baseline video, but that difference was attenuated in the presence of deceptive advertisements. Participants who made the right choice were more likely to share the video than those who did not, but only when faced with deceptive advertisements. Presumably those participants were the only ones who could (a) detect the right answer, and (b) recognize the potential that others might be fooled. Finally, we provide process evidence suggesting how the video and deceptive advertisements affected choice through their respective effects on the amount and allocation of attention, as well as the importance of understanding multiple paths to sharing. Factors that increase perceived effectiveness alone without affecting properties of the video may increase the

likelihood of sharing, but an ineffectively tagged video that does not enhance perceived effectiveness could actually decrease sharing.

2. Method and Design

2.1 Video Production

The storyline and production of the video was accomplished with a professional animator. Our goal was to make the video informative for a common but important life choice, but also to make it entertaining enough to make it worth watching and sharing with others. We chose the domain of credit card traps because we felt it would be relevant to a broad cross-section of the population. In choosing the storyline and developing the video, we focused on Heath and Heath's (2007) features of "stickiness" to maximize its potential for effectiveness and longevity of effects.

The animated video leads the viewer through a story from a first-person perspective. The main character watches a credit card commercial on television and discovers a "magic remote" on his coffee table that allows him to uncover hidden captions in the commercials, see what the spokesman in the commercial is hiding by flipping around the perspective of the camera, and detect hidden messages when rewinding the video.

The video is approximately two minutes long and conveys three basic points about credit cards. The first is that "no preset spending limit" is not the same as "no spending limit". The second is that there are a lot of hidden fees that can add up. The third is that "fixed APR" does not necessarily mean that an APR that cannot change.

In our experiment, we presented two different versions of the video to our subjects. The first version, which we call our "baseline" video, is the standalone story as described above. The

basic idea was to convey the three primary messages in a humorous format, as many popular online videos tend to be. The second version, which we call the "tagged" video, included a short addition to the baseline video, which was composed of a recap of the three main messages and a schematic of where to find key information on the standard pricing and terms document that typically accompanies credit card offers (see Figure 1). This "tagged" version was designed to make it crystal clear to the viewer exactly how to use the information that was contained in the base video. Indeed, previous research (e.g., Beshears et al. 2010) has indicated that many consumers are not be able to act on simplified information like this, if it is not clear how to use it.

Before performing the experiment as described more below, we performed pretests on subjects to determine how the video is perceived. Pretesting indicated that participants from our subject population found the video to be engaging and shareable. It also indicated that the recap and the implementation schematic had additive effects on video effectiveness. As such, we used the combination of the two in our tagged video. This enabled a large enough effect size to observe whether it was moderated by other factors, but also meant that the observed effects are the result of the combination of summary and implementation instructions.

2.2 Credit Card Choice

After viewing a video, participants in the study made a hypothetical credit card choice from a website that we constructed to emulate real on-line websites.[6] Figure 2 is a screenshot from our experiment. Subjects were asked to choose from among four credit cards. The initial screen had only cursory information about the four credit cards, but had a "Pricing and Terms"

[6] Specifically, we constructed our screenshots to be similar to the credit card offerings at www.chase.com. Additionally, we used pricing and term disclosures that were very similar to those at Chase. The bottom panel of Figure 3 provides a screenshot from the Chase website that demonstrates how it is similar to what was used in our experiment.

link below each card. Using the links, participants could seek out diagnostic information such as APR's, fees, and spending limits, in order to compare the terms offered from the various cards. Clicking on the "Pricing and Terms" link led subjects to view a standardized form similar to the ones typically used in on-line credit card offers (Figure 2).

Based on the factors emphasized in the video, one of the credit cards was the optimal choice. That is, it was strictly better than the other three cards in at least one dimension and at least as good in all of the others. The only way to learn this for certain, however, was to uncover and compare the pricing and terms of all four credit cards. As such, choice of the optimal card served as one dependent variable of interest and indicated high choice quality.

Since we were able to observe when subjects clicked on each link, how long they spent examining each term sheet, and the number of total clicks they used, we could calibrate the effort subjects used to acquire information about their decision. It also allowed us to record where participants directed their attention and identify when subjects simply rushed through the experiment

Because consumers frequently have to contend with competing information when they make real decisions, we chose to study a particularly pernicious source: deceptive advertising. Indeed, as in the everyday consumer environment, the advertising may not be technically wrong, but is deceiving to consumers as it makes a product sound more attractive than it really is. In our study, we examined the effect of this competing information by assigning some participants to see no advertising and some to see relatively minor deceptive advertising in the form of tag lines associated with each credit card in the choice phase of the study. These tag lines were not necessarily false, but they appeared to be more diagnostic than they truly were. For example, one card was labeled "Low APR". That statement may have been true in an absolute sense, though

the card actually had the highest APR from the set and so the statement was misleading in a relative sense. Figure 3 contrasts the two versions of the screenshots that subjects viewed before making their choice. Panel A of Figure 3 shows a case in which no added information was given, whereas Panel B adds the taglines to each card.

2.3 Design and Procedure

Two key factors were manipulated in the experiment, so we used a 2 (Video: Traditional, Traditional + Implementation) x 2 (Advertisements: No Ads, Misleading Ads) between-participant experimental design. The traditional baseline video provided an entertaining presentation of three credit card traps. The tagged video gave a brief recap and additional guidance regarding where to find the information embedded in a pricing and terms pamphlet. In the Misleading Ads condition, when consumers were choosing a credit card, they saw taglines for each of four cards ("Low minimum payment", "Low fees", "Use it anywhere", "Low APR"), which were intentionally misleading. The "Use it anywhere" card was the optimal option. In the No Ads condition, there were no taglines associated with any card.

Our procedure was as follows. Participants began by watching one of two videos, depending on condition. After viewing the video, participants chose one credit card from a set of four. Each credit card was identified by letter (A, B, C, D; card C was the optimal card), a stock picture of a credit card, and a link that would reveal pricing and terms below the card display. Participants in the Misleading Ads condition also saw taglines for each card. The survey recorded which option participants chose, how many times they viewed the pricing and terms for each card, and the amount of time spent viewing the pricing and terms for each card.

After the credit card choice, the survey assessed sharing using measures based on Berger (2011). Participants reported *willingness to share* and *likelihood of sharing* the video with friends, family members, and coworkers on seven-point scales (from 1 = Not at all to 7 = Extremely). These six items were combined into a single sharing scale. Also, based on Barasch and Berger (2013), we asked whether participants were more likely to share the video with a specific individual or a broad group.

After measuring willingness and likelihood of sharing, we measured how effective participants thought the video was and how confident they were in their choice. Participants rated five items measuring choice efficacy and video effectiveness on a 7-point scale (where 1 = Strongly disagree, 7 = Strongly agree). These items were: 1) "I am confident that I picked the best credit card;" 2) "Choosing the best credit card was easy;" 3) "The video helped me make my choice more efficiently;" 4) "I would have made the same choice without the video" (reverse coded); and 5) "The video would help my best friend make the right credit card choice."

Following that, we asked a variety of 7-point semantic differential items regarding how the participant was feeling, based on Olney, Holbrook, and Batra (1991). The scales assessed current happiness (*Happy-Unhappy, Pleased-Annoyed, Satisfied-Unsatisfied, Contented-Melancholic, Hopeful-Despairing*) and arousal (*Relaxed-Bored, Stimulated-Relaxed, Excited-Calm, Frenzied-Sluggish, Jittery-Dull, Wide awake-Sleepy, Aroused-Unaroused*). Also based on Olney et al.'s measures of advertisements, we measured how participants would describe the video along several dimensions: special (*Peculiar-Ordinary, Just like any other video-Different from any other video, Average-Special, Weird-Normal, Nothing special-Outstanding*), hedonic (*Unpleasant-Pleasant, Fun to watch-Not fun to watch, Not entertaining-Entertaining, Enjoyable-Not enjoyable*), utilitarian (*Important-Not important, Informative-Uninformative, Helpful-Not*

helpful, Useful-Not useful), and interesting (*Makes me curious-Does not make me curious, Not boring-Boring, Interesting-Not interesting, Keeps my attention-Does not keep my attention*). These measures allowed us to assess how the videos were perceived and whether the tag changed the assessment of the video.

To test whether the effects of the video or ads varied according to important consumer characteristics, participants reported how frequently they share videos through each of four channels (Facebook, Email, Twitter, and Google+), and whether or not they have a credit card (and if so how many credit cards). As the choice among four credit cards assumed participants were going to apply for a card, we also measured the extent to which participants thought the video made them more or less likely to apply for a credit card. Finally, participants described their reactions to the video in their own words and provided basic demographic information (Age, Sex, Ethnicity, Education, Income).

2.4 Participants

Four hundred and one participants recruited on Amazon Mechanical Turk participated in this study. These participants, though not a representative sample, reflect a broader cross-section of the US population than a college-student population. 44% of the sample was female. Age ranged from 18 to 72, with a median age of 29. Median income fell between $25,000 and $50,000, and median education was some college, but not a four-year degree. As our study focused on sharing of videos via social media, it was important to assess whether this action was relevant to our subject population. Indeed, more than 50% of the sample shared reported sharing a video via Facebook, email, Twitter, or Google+ at least 2 to 3 times per month.

3. Results

In this experiment, we examined a variety of dependent variables to get a wide assessment of the effects of implemental instructions and deceptive advertising on sharing and choice, and of how sharing and choice are related to one another. We begin by reporting how attention and choice varied as a function of the type of video and the presence of deceptive advertisements. Then, we consider the effect of these variables on perceived effectiveness and sharing. Finally, we analyze the process by which perceptions of the video and choice mediated the participants' decisions to share.

3.1 Attention and Choice

Attention paid to each card was operationalized by taking the log of the number of seconds the participants spent looking at pricing and terms for each card; 1 was added to each duration prior to taking the log to account for 0's. Reported means were transformed back into the original metric for ease of interpretation. Logged durations for cards A, B, and D (the dominated options) were averaged together, as we had no a priori hypotheses about differential effects on the dominated cards. The resulting attention measures were analyzed using a 2 (Video: No tag; Tag) x 2 (Advertisements: No ads; Deceptive ads) x 2 (Card: C; Average of A, B, and D) repeated measures ANOVA where the first two measures were between-subject and the third was within-subject.

There was a main effect of Ads such that participants spent less time examining the pricing and terms of each card when there were deceptive ads (M = 4.57 seconds) than when there were no ads (M = 10.68 seconds; $F(1, 397) = 40.18$, $p < .0001$). Advertising, even though it was misleading, crowded out active information acquisition. There was also a main effect of

card, such that participants spent more time examining card C (M = 7.53 seconds) than the average of cards A, B, and D (M = 6.76 seconds; $F(1, 397) = 19.46$, $p < .0001$). Across conditions, participants spent more time than expected by chance looking at the optimal card. However, that effect was qualified by two two-way interactions. First, the difference between the time spent examining card C and the other cards was reduced when there were misleading ads compared to no ads (M_{MisleadC} = 4.77 seconds, $M_{\text{MisleadOther}}$ = 4.50 seconds, M_{NoneC} = 12.02 seconds, $M_{\text{MisleadOther}}$ = 10.27 seconds; $F(1, 397) = 4.54$, $p < .05$). The misleading ads reduced information acquisition overall and wiped out any difference in attention paid across cards. Second, the difference between time spent examining card C and the other cards was larger for participants who saw the video including the tag (M_{TagC} = 8.51 seconds, M_{TagOther} = 7.15 seconds, M_{BaseC} = 6.66 seconds, $M_{\text{BaseOther}}$ = 6.41 seconds; $F(1, 397) = 8.10$, $p < .01$). Even though the information regarding pricing terms was available for all of the participants, the tag in the video helped treated subjects to focus their attention on the important information[7].

We also examined how choice of the optimal option varied as a function of the type of video, advertisements, and their interaction via logistic regression. Those who saw misleading advertisements were less likely to choose the optimal option than those who saw no advertisements (34.5% vs 57.1%, Wald $\chi^2(1) = 21.68$, $p < .0001$). Participants who saw the tagged video were more likely to choose the optimal option than those who saw the video without the tag (52.8% vs. 38.6%, Wald $\chi^2(1) = 9.58$, $p < .005$). There was no significant interaction between advertisement and video type ($p > .2$). The effect was directionally, but not significantly, larger for the deceptive ads condition than the no ads condition; see Figure 4. This

[7] This finding underscores our assertion that subjects took the decision in our experiment seriously, even though they were not given explicit monetary incentives. Indeed, as one would expect, for those subjects that were further "educated" in the video, they spent more time investigating and search for the optimal choice.

finding reinforces the notion that a clever informative video is not enough: the information must also be actionable.

Finally, we considered the effects the treatments had on the propensity for people to apply for a credit card following the experiment. Admittedly, when choosing one of four credit cards, participants were not given a "no choice" option. The key question then is whether their likelihood of applying for a credit card was affected by the ads or the video. The ads had no main or interactive effects, but the type of video had a strong effect on likelihood of applying ($F(1, 397) = 31.70$, $p < .0001$). Participants rated themselves as significantly more likely to apply for a credit card when shown the video including the tag ($M = 3.51$, $SD = 1.31$) than the baseline video ($M = 2.77$, $SD = 1.30$). Apparently the baseline video made participants wary of credit cards without empowering them with the ability to make an effective choice. By showing them where to find the necessary information, the tagged video enhanced the likelihood of applying

3.2 Perceptions and Attitudes toward Sharing

One of the key variables was the perceived effectiveness of the video. To assess this, we combined the five effectiveness items into a single measure (Cronbach's $\alpha = 0.59$). We analyzed this measure as a function of the type of video, ads, and their interaction. When the participants saw misleading ads, participants reported that the video was marginally less effective ($M = 4.12$, $SD = 0.91$) than when there were no ads ($M = 4.26$, $SD = 1.00$; $F(1, 397) = 3.63$, $p < .06$). Participants reported that the video with the tag was significantly more effective ($M = 4.55$, $SD = 0.85$) than the video without the tag ($M = 3.83$, $SD = 0.93$; $F(1, 397) = 69.26$, $p < .0001$). Each of these effects was qualified by a significant interaction ($F(1, 397) = 5.93$, $p < .05$). When participants saw the base video, they rated it equally effective whether they saw misleading ads

(M = 3.85, SD = 0.85) or no ads (M = 3.81, SD = 1.00). However, when participants saw the tagged video, they rated it as less effective when they saw misleading ads (M = 4.37, SD = 0.90) than when they saw no ads at all (M = 4.75, SD = 0.74). Even though the effect of the video on actual choice was equally strong whether or not there were ads (and was directionally stronger when there were deceptive ads), the ads made participants report that the video was less effective. Non-diagnostic information at the time of choice decreased the perceived diagnosticity of the useful implemental information contained in the video.

We then proceeded to analyze how the different versions of the videos differed with regard to the subjects' overall assessments and feelings. First, we analyzed happiness and arousal as functions of the type of video, ads, and their interaction. No effects were significant. This suggests that differences in sharing were not due to differences in arousal level (Berger 2011).

Next, we analyzed whether how special, hedonic, utilitarian, and interesting the videos were varied as a function of the type of video, ad, and their interaction. The tagged video was perceived as less special (M_{Base} = 4.87, SD = 0.93; M_{Tag} = 4.64, SD = 0.89; $F(1, 397) = 6.26$, $p < .05$) and more utilitarian (M_{Base} = 5.25, SD = 1.23; M_{Tag} = 5.73, SD = 1.06; $F(1, 397) = 17.84$, $p < .0001$), but did not differ on hedonic or interesting. There was a non-interpretable interaction between ads and the type of video on hedonic ratings ($F(1, 397) = 4.13$, $p < .05$), though this may reflect a spurious effect at the 5% level given the number of analyses conducted. There was also a marginal interaction between ads and the type of video on utilitarian ratings ($F(1, 397) = 3.07$, $p < .1$), indicating that the usefulness of the tagged video over the base video may have been somewhat larger for the no ad group than the misleading ad group.

Finally, we considered how the various treatments affected peoples' tendency to share. The six sharing items (Cronbach's $\alpha = 0.94$) were combined into a single sharing measure and

analyzed as a function of video, ads, and their interaction. The baseline video was marginally more shareable than the tagged video ($M_{Base} = 4.74$, $SD_{Base} = 1.68$; $M_{Tag} = 4.44$, $SD_{Tag} = 1.62$; $F(1, 397) = 3.47$, $p < .07$). Even though the video including the implemental tag had a significant effect on choice, it was somewhat less likely to be shared. We explore these opposing influences next.

3.3 Mediation Analysis

3.3.1 Attention Mediates Effects on Choice

As described above, the video tag and deceptive ads affected the total amount of attention allotted to pricing and terms, the allocation of attention across different cards, and choice quality. Did variation in attention explain variation in choice? To examine this question, we conducted mediation analyses using Hayes' (2013) PROCESS macro (model 8) with confidence intervals based on 10,000 bootstrapped samples. We tested whether there were effects of false advertising, video tag, or their interaction on choice through parallel mediators of amount of attention (average log duration) and allocation of attention (difference in log duration between card C and the average of cards A, B, and D). In other words, were there indirect effects of the manipulation on choice through attention?

We answered this question by conducting three sets of analyses on bootstrapped samples (see Hayes 2013 for details). One analysis regressed the average log duration on ads, video, and their interaction. The second regressed differences in the log duration on ads, video, and their interaction. The third regressed choice quality on ads, video, their interaction, average log duration, and difference in log duration. See Table 1 for individual regression results. The indirect effects of the interaction were not significant, as indicated by 95% bootstrapped

confidence intervals that did not exclude 0, so we focused on the effects of each variable when estimated at the average value of the other variable.

Compared to no ads, deceptive ads had two significant detrimental effects on choice. First, deceptive ads reduced choice quality by reducing the amount of attention paid to pricing and terms overall (B = -0.1039, SE = 0.0435, 95% CI: [-0.2028, -0.0321]). Second, deceptive ads also reduced choice quality by reducing the asymmetry in attention paid to card C vs. cards A, B, or D (B = -0.1051, SE = 0.0539, 95% CI: [-0.2211, -0.0097]). There was also evidence for a residual negative direct effect of false ads on choice quality that was not accounted for by our measure of attention (B = -0.3557, SE = 0.1197, $p < .01$), providing evidence for complementary mediation such that the indirect and direct effects were each significant and operated in the same direction (Zhao, Lynch, and Chen 2011). The direct effect suggests that there may be additional processes by which misleading advertisements influenced choice.

Compared to the baseline video, the tagged video enabled better choices through the reallocation of attention rather than through increased attention. There was no significant effect of the video tag on choice quality through amount of attention (B = 0.0207, SE = 0.0188, 95% CI: [-0.0073, 0.0685]). However, there was a significant effect of the video tag on choice quality through the relative attention paid to card C vs. cards A, B, or D (B = 0.1405, SE = 0.0570, 95% CI: [0.0403, 0.2663]). There was no residual direct effect of video tag (B = 0.2182, SE = 0.1170, $p > .05$), providing evidence for indirect-only mediation meaning that there was an indirect effect but no direct effect (Zhao et al. 2011). Although deceptive advertisements affected choice quality by both reducing the amount of attention and the proper allocation of attention, the video tag increased choice quality by improving the allocation of attention without needlessly drawing on additional resources. This suggests that the education was effective at increasing the efficiency of

cognitive resource use rather than increasing the deployment of cognitive resources. Analogous analyses indicate that there was an indirect effect of video tag on likelihood of applying for a credit card through allocation of attention.

3.3.2 Perceived Effectiveness Mediates Effect on Sharing

We also examined the extent to which the perceived effectiveness of the video mediated the effects of video and advertisements on the likelihood and willingness to share. We again used Hayes' (2013) PROCESS macro (model 8) to examine the interactive effects of the video tag and misleading advertisements on sharing through perceptions of video effectiveness. See Table 2. The interaction had a significant indirect effect, as indicated by a 95% confidence interval that excluded 0 (B = -0.0662, SE = 0.0314, 95% CI: [-0.1372, -0.0145]), so we examine the conditional effects of the video for the no ads condition and the misleading ads condition. In each condition, the tagged video had a significant positive indirect effect on sharing through perceived effectiveness. This effect was larger when there were no ads (B = 0.2922, SE = 0.0622, 95% CI: [0.1787, 0.4245]) than when there were misleading ads (B = 0.1599, SE = 0.0439, 95% CI: [0.0838, 0.2558]). These results indicate that the video tag increased perceived effectiveness, which in turn increased sharing. Although there were positive effects of the video tag on sharing through perceived effectiveness across the board, they were reduced in the presence of misleading ads.

However, there is an important caveat to these findings. After accounting for the indirect effects via perceived effectiveness, there was a residual direct effect of the video tag on sharing. Notably, this direct effect is negative (B = -0.3799, SE = 0.0847, $p < .0001$), providing evidence for competitive mediation such that the indirect and direct effects operate in opposite directions

(Zhao et al. 2013). Above, we reported that the tagged video was marginally less likely to be shared than the baseline video. This marginal decrease hides two strong competing effects. The tagged video did increase sharing by increasing perceived effectiveness. However, it also decreased sharing directly. The relative weights on these two paths may differ in different circumstances, and therein lies a fundamental problem for encouraging good financial decisions through social media: the very videos that have the greatest potential to increase decision quality may also be the ones that are the least shareable.

3.3.3 Choice, Perceived Effectiveness, and Sharing

So far we have described two separate analyses, one on choice quality as a function of attention, and one on sharing intentions as a function of perceived effectiveness. But these two analyses are fundamentally linked. What is the relationship between choice quality and perceived effectiveness? To answer that question, we analyzed the perceived effectiveness as a function of the type of video, ads, choice quality, and all two and three-way interactions. Those who chose better-quality options ($M = 4.48$, $SD = 0.92$) found the video to be more effective than those who chose worse-quality options ($M = 3.94$, $SD = 0.92$; $F(1, 393) = 24.42$, $p < .0001$). However, this did not interact with either ads or type of videos. In other words, participants who were able to put the information in the video to good use rated it as more effective than those who were not able to put it to good use.

What is the relationship between choice quality and sharing? To answer that question, we analyzed sharing as a function of the type of video, ads, choice quality, and all two and three-way interactions. We found an unexpected but explainable interaction between choice quality and misleading ads ($F(1, 393) = 5.78$, $p < .05$). When participants made a poor choice (i.e., they

chose card A, B, or D), they were equally likely to share the video whether they chose in the presence of misleading ads (M = 4.48, SD = 1.82) or no ads (M = 4.62, SD = 1.60). However, when participants made a good choice (i.e., they chose card C), they were more likely to share the video when they chose in the presence of misleading ads (M = 5.07, SD = 1.51) rather than in the presence of no ads (M = 4.40, SD = 1.54). This interaction is shown in Figure 7. This suggests that the impact of quality decisions on sharing necessitates the proper context. If the context makes it easy to see how someone else could be fooled (e.g., through deceptive advertising), even though oneself was not fooled, one will be more likely to share the video to help others compared to when the context does not make it so clear that someone else might be fooled.

3.4 Moderators

We next examined whether the effect of our manipulations on our measures of interest (amount of attention, focus of attention, choice, sharing, perceived effectiveness, and likelihood of applying) were moderated by demographics (sex, age, education, income), or credit card status (have vs. do not have). No effects were significantly moderated by frequency of sharing via one's most frequent sharing source. We discuss the significant ($p < .05$) results below.

Sex. The tag was more impactful for men in our sample than women. For log average time spent on the video, there was a significant three-way interaction among ads, video, and sex ($F(1, 393) = 4.38$, $p < .05$). Men spent more time when there were no ads rather than misleading ads and when they had seen the video tag rather than the baseline tag; the three-way interaction was because the effect of the tag for men was marginally stronger for misleading ads than no ads. Women spent more time when there were no ads rather than misleading ads, but were not affected by the video tag. There was also a significant interaction between sex and tag on choice

of the optimal card ($\chi^2(1) = 4.72$, $p < .05$). Men who saw the tag made better choices than those who did not, whereas the tag showed no benefit for women. No other interactions involving sex were significant.

Age. All interactions included Age as a continuous variable. For interpretability, we report estimated effects for 20 and 40 year olds. Attention to the pricing and terms varied as a function of ads, video, and sex ($F(1, 393) = 4.87$, $p < .05$. For 20-year-olds, the tag increased attention when there were false ads but not when there were no ads. For 40-year olds, the tag did not increase attention. The effect of misleading ads on attention to the optimal card (vs. the other cards) varied as a function of age ($F(1, 393) = 4.25$, $p < .05$). 20-year-olds spent more time on the optimal card whether there were misleading ads or not, whereas 40-year olds spent more time on the optimal card only when there were no ads and not when there were misleading ads.

Likelihood of applying for a card varied as a function of the video, ads, and age ($F(1, 393) = 4.52$, $p < .05$), such that the difference in application likelihood between tagged and base videos was particularly pronounced for 20-year-olds faced with misleading ads. No other interactions involving age were significant.

Credit Card Status. Nearly one-third of the sample did not have a credit card. Did the effects vary according to credit card status? There was a three-way interaction on amount of attention between video, ads, and having a credit card ($F(1, 393) = 5.43$, $p < .05$). Participants without a credit card who were faced with misleading ads were most strongly affected by the video tag. Likelihood of applying for a credit card varied as a function of having a card and misleading ads ($F(1, 393) = 4.74$, $p < .05$). Misleading ads decreased application likelihood for those without credit cards but not those with credit cards. No other interactions involving credit card status were significant.

Education. Sharing varied as a function of education and misleading ads ($F(1, 393) = 4.90$, $p < .05$). For interpretability, we report the estimated effects for those with less than a high school education and those who are college graduates. Misleading ads increased the likelihood of sharing for those with less than a high school education but not for college graduates. The effect of misleading ads on perceived effectiveness varied as a function of education ($F(1, 393) = 3.91$, $p < .05$), such that misleading ads decreased perceived effectiveness for college grads but not for those with no high school degree.

Income. We include our ordinal income measure as a continuous variable, reporting estimated effects for those falling in the lowest income bracket (under $25,000, 29% of the sample) and those in the third income bracket ($50,000 to $74,999, covering the 58th to 80th percentile of our sample). The effect of video tag on choice varied with income ($\chi^2(1) = 4.20$, $p < .05$). There was no effect for low-income individuals, but the tag improved choice for higher-income individuals.

The effect of the tag on sharing also varied with income ($F(1, 393) = 6.60$, $p < .05$). At lower incomes, the tag decreased sharing, whereas at higher incomes, it did not. Finally, the effect of the tag on perceived effectiveness also varied with income ($F(1, 393) = 7.88$, $p < .01$). The tag increased perceived effectiveness even for those with low incomes, but the effect was stronger for those with higher incomes.

Overall, the influence of our tagged video tended to be strongest for men, younger participants, and higher-income participants.

4. Conclusion

This relatively simple experiment has yielded a rich dataset. First, online videos do have the potential to increase the quality of household financial decisions, but merely presenting the information in an engaging sticky format is not sufficient. The information must be interpretable and implementable in order to direct attention appropriately. Second, effective does not indicate sharable. In our study, increasing the effectiveness of the video by adding an implementation tag also marginally decreased sharing. In fact, had it not been perceived to be more effective, it would have been considerably less likely to be shared. Third, the perceived effectiveness, and the effect of actual effectiveness, depend on the choice context. Consumers found our implemental video to be more efficacious than our baseline video, but that difference was attenuated in the presence of deceptive advertisements. Participants who made the right choice were more likely to share the video than those who did not, but only when faced with deceptive advertisements. Presumably those participants were the only ones who could (a) detect the right answer, and (b) recognize the potential to be fooled. Finally, we provide process evidence suggesting how the video and deceptive advertisements affected choice through their respective effects on amount and allocation of attention, as well as the importance of understanding multiple paths to sharing. Factors that increase perceived effectiveness alone without affecting properties of the video may increase the likelihood of sharing, but changing the video without affecting perceived effectiveness can actually decrease sharing.

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Figure 1. Video screenshots. The top left panel shows the video protagonist using the magic remote to turn on sub-titles. The top right panel shows the subtitles that are displayed. The bottom left panel shows the recap. The bottom right shows the implementation instructions of how to act on that information. The tag, portrayed via the two bottom panels, was not shown to the baseline participants.

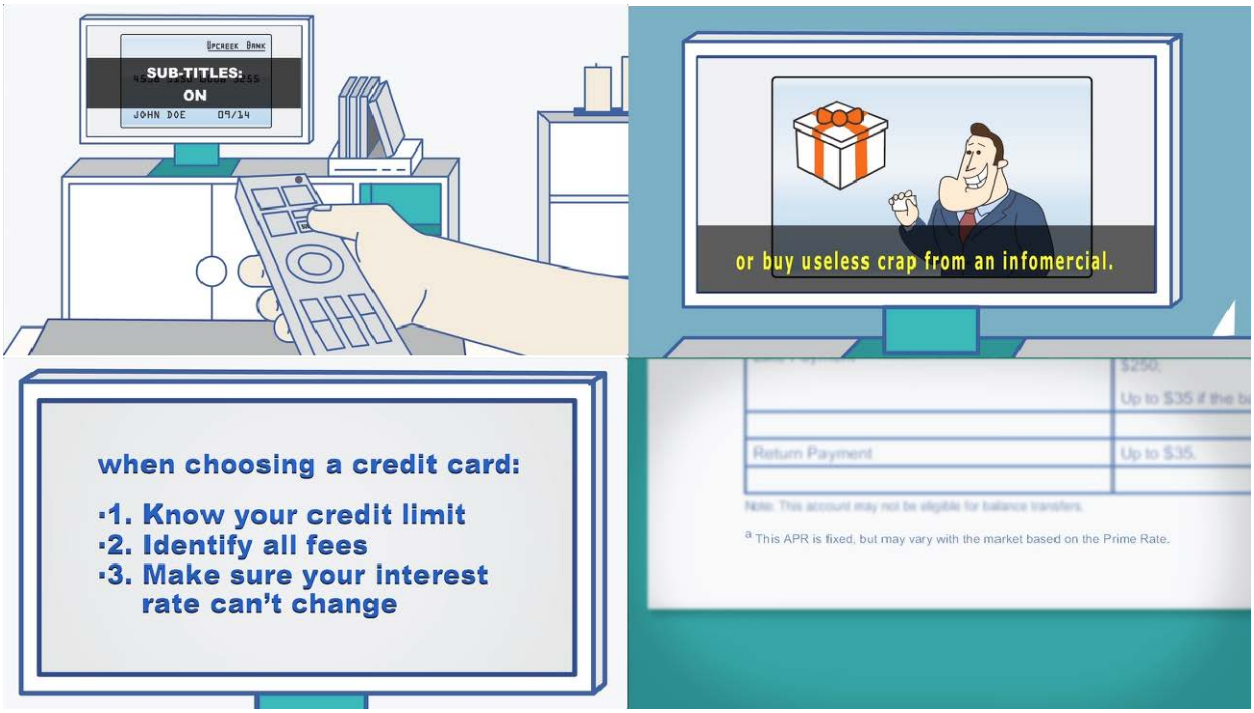

Figure 2. Choice stimuli used in the study. The taglines (e.g., "Low minimum payment") were excluded in the "No Ads" condition. The Pricing & Terms information was only shown if participants clicked on "Pricing & Terms" under a card. If participants clicked on the Pricing & Terms for Card B while the screen displayed the information for Card C, the information would change to Card B.

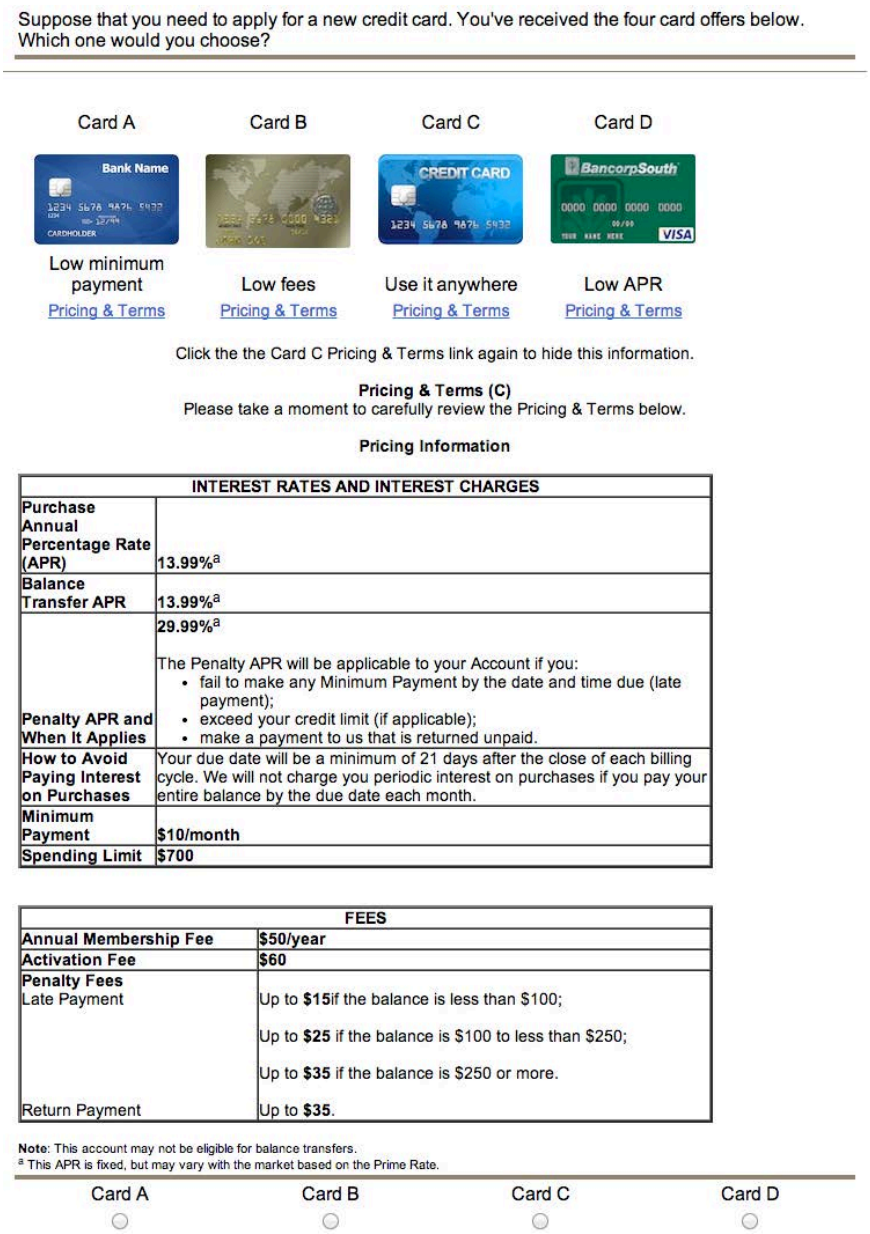

Figure 3. Credit card stimuli. The top panel shows the misleading ads condition. The middle panel shows the no ads condition. The bottom panel shows the similar offering from Chase.com.

Figure 4. Choice share per condition. Darker areas represent choice of the best card.

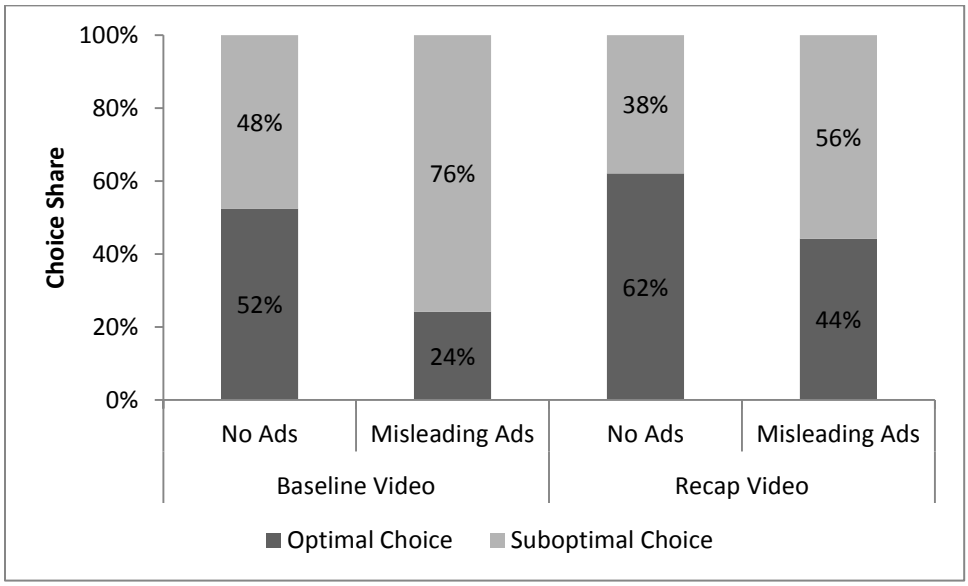

Table 1. Regression coefficients for mediation model. Tagged video was coded 1 for tagged video, -1 for baseline video. Misleading ads was coded 1 for misleading ads condition, -1 for no ads condition.

	AvgLnTime			DiffLnTime			Choice (Logits)		
Antecedent	Coeff	SE	p	Coeff	SE	p	Coeff	SE	p
Constant	1.9430	0.0685	<.0001	0.1080	0.0245	<.0001	-0.8941	0.2001	<.0001
Tagged Video	0.0851	0.0685	.2151	0.0697	0.0245	.0047	0.2182	0.1170	.0620
Misleading Ads	-0.4274	0.0685	<.0001	-0.0521	0.0245	.0338	-0.3557	0.1197	.0030
Tag x Mislead	0.0364	0.0685	.5952	-0.0021	0.0245	.9318	0.1367	0.1166	.2412
AvgLnTime							0.2432	0.0834	.0035
DiffLnTime							2.0166	0.3038	<.0001

Table 2. Regression coefficients for mediation model. Tagged video was coded 1 for tagged video, -1 for baseline video. Misleading ads was coded 1 for misleading ads condition, -1 for no ads condition.

	Perceived Effectiveness			Sharing		
Antecedent	Coeff	SE	p	Coeff	SE	p
Constant	4.1958	0.0441	<.0001	1.989	0.3815	<.0001
Tagged Video	0.3666	0.0441	<.0001	-0.3799	0.0847	<.0001
Misleading Ads	-0.0840	0.0441	.0574	0.1519	0.0785	.0536
Tag x Mislead	-0.1073	0.0441	.0153	0.0931	0.0787	.2377
Perc. Effectiveness				0.6166	0.0890	<.0001