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On the Naturalistic Relationship Between Mood and Entertainment Choice

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People are sensitive to economic conditions, buying more during booms and less during recessions. Across seven studies, the present research examines whether the nature of their purchases also changes as diffuse, prevailing mood states shift from positive during boom periods to negative during recession periods. Existing research shows that people primarily strive to improve negative moods, whereas they are willing to encounter threatening information when they experience positive mood states. Consistent with these patterns, we find that people showed a relative preference for lighter cultural products during relatively negative economic times, and, to a lesser extent, were slightly more open to heavier cultural products during boom periods. According to archival dataset analyses, these effects persisted across comedic cartoons, music, books, and films. In 2 lab experiments, writing about boom versus recession periods changed preferences for lighter versus heavier cultural products.

Public Significance Statement

Why are people sometimes more open to intense dramas, whereas at other times they prefer breezy comedies? We find that the state of the economy is related to these decisions, such that people prefer lighter books, films, music, and comedy when unemployment rates and consumer uncertainty rise, whereas they tend to be relatively more willing to grapple with heavier entertainment options when unemployment rates fall and consumer confidence rises.

Keywords: economic cycles, mood, consumption, decision making

A large body of research has explored how macroeconomic trends like inflation and recessions affect general spending patterns (e.g., Deaton, 1992; Katona, 1974). For example, during recessionary periods, when people are more constrained, they become less willing to pay more for premium goods (Bohlen, Carlotti, & Mihas, 2010), prefer simpler, user-friendly products (Flatters & Willmott, 2009), have an increased desire for beauty products (at least among women; Hill, Rodeheffer, Griskevicius, Durante, & White, 2012), make material rather than experiential purchases (Tully, Hershfield, & Meyvis, 2015), and spend relatively less on products and services that signal status (Kamakura & Yuxing Du, 2012). Although there has been comparatively less work done on consumer behavior patterns in expansive or nonrecessionary periods, when economic trends are

more favorable, people are more likely to save for retirement (Starr-McCluer, 2002), invest in art (Mandel, 2009), and engage in purchasing patterns that are more associated with seeking positive outcomes (e.g., gambling) rather than avoiding negative outcomes (e.g., buying insurance; Millet, Lamey, & Van den Bergh, 2012).

To what extent, however, do broad-level economic cycles influence entertainment choices, or the types of music, films, books, and comedy that people consume? It is this question that we examine in the present article. Specifically, we ask whether cultural consumption patterns match the state of the economy (e.g., comedies and other lighter material are more popular when the economy is booming; dramas and other heavier material are more popular during recessions), or whether they instead contradict prevailing economic conditions (e.g., comedies and other lighter material are more popular during recessions; dramas and other heavier material are more popular during boom times).

Conceptual Background

Despite a great deal of work on mood and choice (e.g., Alpert & Alpert, 1989; Andrade, 2015; di Muro & Murray, 2012; Fitzsimons et al., 2002; Gardner, 1985), and a burgeoning literature on spending during recessions (e.g., Ang, 2000), relatively little is known about how the underlying moods inspired by changes in economic conditions affect the consumption of cultural goods, such as movies, music, and art in applied, macrolevel settings (but see Nunes, Dreze, & Han, 2011). Our primary research question concerns whether the prevailing mood states inspired by macro-

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economic forces shape whether people prefer heavier or lighter media (i.e., books, movies, songs, etc. meant to be read, watched, listened to, or purchased). In our conceptualization, light media is happy, more upbeat, more positive in tone, distracts one from the challenges of everyday life, and/or does not foster introspection. In contrast, heavy media is sadder, darker, more negative in tone, and/or fosters introspection and allows one to confront difficult themes (see Table 1). Though media exist on a continuum from light to heavy, most popular books, films, and songs fall into discrete genres or tonal categories that fall on one end or the other of that continuum. Consequently, in the majority of our analyses, we dichotomize media as either light or heavy. Though we are the first to tackle the specific problem of how economic cycles relate to entertainment choices, other research has examined related issues and has provided some guidance toward answering this question.

We draw on the observation made by previous theorists that mood can be considered an “alarm system”: bad moods signal an aversive and threatening state that requires repair (e.g., Bless, Fiedler, & Forgas, 2006). Under normal circumstances, people should be motivated to restore equilibrium (i.e., return to a positive state) and repair negative emotional states because of the aversive nature of such states (e.g., Lerner, Li, Valdesolo, & Kassam, 2015). For example, when research participants were led to feel sad, they opted for smaller financial rewards that they could obtain immediately rather than wait for larger ones later (Lerner, Li, & Weber, 2013), and were willing to spend more money to acquire a new object (Cryder, Lerner, Gross, & Dahl, 2008).

In the realm of entertainment choices, Zillmann (1988) has proposed a “mood-management” theory, positing that people will choose media in order to promote positive moods or avoid negative moods. Some empirical studies bear out this prediction. Women (but not men) who were experimentally induced to be in a bad mood chose to read magazine articles that contained good news rather than bad news (Biswas, Riffe, & Zillmann, 1994). In another early study, undergraduate research participants induced to feel a sense of boredom chose to watch significantly more exciting TV shows in an effort to alleviate their boredom, than did participants who were induced to feel stress (Bryant & Zillmann, 1984). Along similar lines, participants placed in a bad mood chose to listen to energetic and joyful music for longer periods of time than did participants who were placed in a good mood (Knobloch & Zillmann, 2002), and when undergraduate participants were given negative feedback about their ability to interpret social cues, they subsequently chose to watch more light-hearted game shows than those who were given positive feedback (Zillmann, Hezel, & Medoff, 1980).

Table 1
Distinguishing Between Light and Heavy Media

Light media	Heavy media
Escapist	Nonescapist
Simple	Complex
Shallow	Deep
Superficial	Challenging
Positive	Negative
More upbeat	Darker

In contrast to negative mood states, positive moods send a message that all is fine in the environment (Lazarus, 1991), and allow organisms to be more creative and risk-taking (Fredrickson, 1998; Fredrickson & Branigan, 2005; Isen, Daubman, & Nowicki, 1987). Positive moods can act as a buffer and enhance the ability to behave in ways that further long-term, rather than, short-term goals (Trope, Ferguson, & Raghunathan, 2001). One account (the “broaden-and-build” theory) suggests that positive emotions may be useful to individuals because they allow for greater perspective and incorporation of negative information (Fredrickson, 2004). Indeed, information or material that can lead to better outcomes in the long run can sometimes be associated with short-term emotional costs (e.g., negative performance feedback that can nonetheless help one improve over time). And, although such negative material can dampen mood, if one starts in a positive state, there will be more of a buffer to deal with and process negative material. As an analogy, some researchers have likened positive moods to currency: just as a rich person has more material resources with which to purchase expensive products that will nonetheless put a dent in his or her budget, someone who is “rich in positive mood” may feel less daunted by the possibility of interacting with or consuming negative material (Alter & Forgas, 2007; Raghunathan & Trope, 2002).

Along these lines, Trope and Neter (1994) found that people were willing to take in negative performance feedback, but needed to be in a good mood first to do so. Relatedly, the literature on mixed emotions suggests that negative emotional states can ultimately lead to better outcomes if experienced concurrently with positive emotional states (Adler & Hershfield, 2012; Fong, 2006; Hershfield, Scheibe, Sims, & Carstensen, 2013). Taken together, there may be benefits to the experience and consumption of negative material, especially when buffered by positive mood states.

Consequently, the research reviewed above suggests that people in negative moods will be more likely to seek out lighter material. And, although people generally prefer to feel good, they may be relatively more willing to engage with heavier experiences when in a good mood already. As a result, we propose an inverse relationship between the state of the economy and the type of entertainment material people consume. When in negative states (i.e., when the economy is generally down as in a recession), people may be motivated to repair their mood (Zillmann, 1988) by consuming lighter material. And, as mood-as-resource theories would suggest, the buffering resources provided by positive moods could lead consumers to be more willing to grapple with heavier material (e.g., Raghunathan & Trope, 2002). More important, we are not suggesting that all negative mood states will result in the consumption of light material, or that all positive mood states will result in the consumption of heavy material. Rather, when in a negative mood state, people may be *relatively* more willing to consume lighter material, and when in a positive mood state—because of the buffering effect of positive mood—consumers may be *relatively* more willing to consume heavy material. Because entertainment is, by definition, an escapist enterprise, we expect people to generally prefer lighter cultural products, though this preference should be tempered during economic booms. We should note, however, that in the present research, we investigate low-level moods—not intense momentary emotions (Gross, 2015). As a result, we do not necessarily expect people to be wallowing or

rejoicing, but rather managing low-level but protracted positive and negative affective states with their purchases.

Overview of Current Research

Throughout most of our investigation, we focus on tractable indicators of behavior in applied settings such as mass-level purchases. Doing so represents a departure from previous laboratory studies that have focused on momentary consumption, which although suggestive of actual behavior, still suffers from the gap between intentions and actions. In Studies 1–2c, we directly examine whether changes in economic conditions are related to changes in the types of cartoons, movies, books, and music that are consumed. More important, throughout these studies, we use both objective and subjective measures of the state of the economy. Specifically, as described in greater detail below, we use two indices of performance that are germane to consumer behavior: the Index of Consumer Sentiment (ICS) and the average monthly U.S. unemployment rate. Because our research question fundamentally concerns the ways in which economic cycles affect entertainment choices among consumers, it was imperative to operationalize economic forces using indices that are directly related to consumer psychology. That is, we chose indices that would reflect and be related to the ways that consumers actually feel. Specifically, the ICS is a measure of consumer sentiment, reflecting how consumers feel about the state of the economy, while unemployment rate is an easily understandable measure of how the economy is performing.

Across these studies, we find a negative relationship between economic cycles (both perceived and objective) and entertainment choices: when economic forces are negative, people seem to prefer light material, but when economic forces are positive, people seem relatively more willing to consume heavy material. Finally, in Studies 3a and 3b, we examine whether this negative relationship between economic cycles and entertainment choices can be detected in tightly controlled experiments by having research participants vividly imagine living in positive or negative economic times and then picking the type of entertainment materials that they would like to consume. This context also allows us to test whether the relationship between economic conditions and entertainment choices will be mediated by mood.

It is important to note that these studies are the first to examine whether changes in mood brought on by economic cycles can affect the types of entertainment choices that people actually make. Although prior work has examined such relationships in laboratory settings with acute emotional changes, these data are the first to explore how broad, low-level mood states brought on by macrolevel forces map onto microlevel entertainment purchases. Ultimately, we make advances to two streams of literature. First, we contribute to the literature that links macroeconomic forces to behavior by highlighting the ways that inverse relationships (i.e., ones that represent negative correlations between two variables) can be uncovered in consequential settings. Second, we contribute to the literature on mood and choice by illuminating a context in which a mood state of one valence may be associated with consumption of oppositely valenced material.

Study 1: Analysis of New Yorker Cartoons

The aim of Study 1 was to determine whether there was a relationship between economic conditions and the tone of popular

cartoons published in *The New Yorker*. Cartoons are submitted to *The New Yorker* by cartoonists on a weekly basis, so their content most likely reflects current mood states (R. Mankoff, personal communication). We hypothesized that there would be a negative relationship between economic conditions and the emotional tone of published cartoons. Because there is no objective way to assess the mood conveyed by a cartoon, we asked raters to judge the emotional tone of cartoons from a time period that spanned 60 years.

Method

Subjective measure. In this study, and Studies 2a–c, we used data from the University of Michigan’s ICS as a subjective measure of the state of the economy. In contrast to the Dow Jones Index or other objective measures of the stock market performance (e.g., the S&P 500, the Russell, 2000), the ICS is a measure of subjective consumer sentiment. ICS scores reflect how confident a representative sample of Americans feels about the overall state of the economy, and were collected quarterly from 1952 to 1978, and then monthly from 1978 through the present day. Scores on the ICS are meant to reflect how consumers feel about the present and future states of the economy.¹ The ICS is normed so that a score of 100 is equivalent to consumer sentiment from May of 1964. Over its history, the ICS has ranged from a low of 51.7 (May, 1980) to a high of 112 (January, 2000), with a mean score of 86.33, a median of 89.80, and a *SD* of 12.37.

Whereas earlier research has suggested that the ICS is an accurate predictor of future consumption (Carroll, Fuhrer, & Wilcox, 1994; Huth, Eppright, & Taube, 1994) and other trends in the national economy, such as the future rate of growth of real Gross Domestic Product and personal consumption expenditure (Howrey, 2001), recent work suggest that the ICS is more of a lagging indicator of economic performance (i.e., it represents how consumers feel the economy is performing at a given time), rather than a leading indicator of future performance. Along these lines, Kellstedt, Linn, and Hannah (2015) found that the ICS does not hold significant predictive power of future consumer spending when other standard economic indicators are also taken into account. What the ICS does seem to more strongly track is more broad-level macroeconomic trends that are easily noticed by consumers (e.g., unemployment rate) compared with macroeconomic trends that have less direct impact on consumers (e.g., monthly trends in stock market performance). For example, in terms of stock market performance, prior research has indicated that the ICS may have a short-lived relationship with the equity markets:

¹ The index comprises five questions (1) We are interested in how people are getting along financially these days. Would you say that you (and your family living there) are better off or worse off financially than you were a year ago?; (2) Now looking ahead—do you think that a year from now you (and your family living there) will be better off financially, or worse off, or just about the same as now?; (3) Now turning to business conditions in the country as a whole—do you think that during the next 12 months we’ll have good times financially, or bad times, or what?; (4) Looking ahead, which would you say is more likely—that in the country as a whole we’ll have continuous good times during the next 5 years or so, or that we will have periods of widespread unemployment or depression, or what?; (5) About the big things people buy for their homes—such as furniture, a refrigerator, stove, television, and things like that. Generally speaking, do you think now is a good or bad time for people to buy major household items?.

daily changes in the market do seem to lead to small changes in consumer sentiment (Otoo, 1999; though perhaps larger changes in particularly volatile times such as the Great Depression; Romer, 1990), but its effects seem to last for only about 2 weeks to 1 month (Jansen & Nahuis, 2003). Macroeconomic indicators that move more slowly than equity markets, however, show strong links to the ICS. The unemployment rate has a strong negative relationship with the ICS (Mueller, 1966). See Mandal and McCollum (2013) for a discussion of the causality between these indicators over time, and Curtin (2009) for a nuanced discussion of whether the ICS is truly a leading or a lagging indicator of economic performance. For a description of the ICS survey methods, see http://press.sca.isr.umich.edu/press/about_survey.

Objective measure. In this study and Studies 2a–c, we used unemployment rate as an objective measure of economic performance. Stated simply, the unemployment rate represents the percentage of working age adults who are unemployed relative to the number of people who are in the total labor force (Bureau of Labor Statistics, 2018). We used unemployment rate as an objective indicator of economic performance because, in theory, it should to be an indicator that has a direct and concrete relationship with consumer mood (i.e., if the unemployment rate is high, it is relatively harder to get a job and provide for one's family than if the unemployment rate is lower). Indeed, it seems to be more closely tracked by Americans than other, more abstract indicators such as stock market performance: a majority of Americans (53%) follow and correctly estimate the current unemployment rate (Pew Research Center, 2010), whereas only 10% of Americans state that they follow the stock market closely (with 52% saying that they do not following the stock market at all, and 21% stating that they do not follow it too closely; Pew Research Center, 2013).

Cartoon ratings. We obtained cartoons published in each issue of the *New Yorker* from 1952, 1962, 1972, 1982, 1992, 2002, and 2012 ($N = 6,435$ cartoons). The cartoons were stripped of any details that were indicative of the date. Participants were 1,442 unique members of Amazon's Mechanical Turk (MTurk) pool ($M_{\text{age}} = 35.77$, $SD_{\text{age}} = 11.42$ years; 37% men), and were paid 50 cents upon completion of the study. The study used a pseudorandomized design in which each participant rated 15 different cartoons on five dimensions. Because of the total number of participants that this study required, we allowed participants to participate more than once (median number of times participating = 1; mean number of times participating = 2.98). To ensure that participants did not rate the same cartoon more than once, the total database of 6,435 cartoons was broken down into 429 sets of 15 cartoons, randomly pulled from across the seven decades in the total set of cartoons. Accordingly, a given participant saw a set of 15 cartoons at a time and, because of a filter implemented in the MTurk platform, was prevented from seeing the same set more than once. Each set of 15 cartoons was shown to 10 MTurk participants, ensuring that 10 different participants rated every cartoon on five different dimensions (described below). To ensure that the randomization was properly working, the first set of 15 cartoons was shown to 20 participants rather than 10, and the second set was shown to 11 participants.

Every cartoon was rated on two focal dependent variables using 5-point scales that assessed (a) the tone of the cartoon (two anchors: "paints a negative picture of humanity" and "paints a positive picture of humanity") and (b) the darkness of the cartoon

(two anchors: "is very dark" and "not dark at all"); thus, higher scores on both of these dimensions were associated with a more positive, and less dark portrayal. There were three additional 5-point bipolar scales that comprised control variables, which assessed (c) how funny the cartoon was (two anchors: "is not funny" and "funny"), (d) the purpose of the cartoon (two anchors: "is designed to be educational and to shed light on something in society" and "is designed to be funny and to make you laugh," and (e) how understandable the cartoon was (two anchors: "is hard to understand" and "is easy to understand"). These three control variables overlapped with tone and darkness—funny and understandable cartoons, for example, are almost certainly lighter than unfunny and puzzling cartoons—but we sought to isolate tone and darkness as independent metrics beyond their overlap with humor, purpose, and understandability. Thus, with 6,435 cartoons each rated 10 times on five dimensions, there were a total of 321,750 ratings made. Each scale had a "not relevant" scale point in case a participant felt that a given category was not applicable to a given cartoon, and this option was chosen 14,375 times (4% of ratings).

After completing a consent form, participants were first given a sample cartoon and instructions for how to interpret the scales (see Appendix). Participants then rated the set of 15 cartoons and completed demographic questions (i.e., age, gender).

Results and Discussion

Data for all studies, and materials for Studies 3a and 3b, are available at <https://osf.io/b74nk/>. To assess the relationship between economic trends and the content of cartoons, we took several steps. First, for every cartoon, we averaged the 10 participant ratings for each of the five scales. That is, each cartoon was reduced to five ratings for tone, darkness, funniness, purpose, and how understandable the cartoon was, resulting in five cartoon-level ratings per cartoon. If a given participant chose "not relevant" for a particular scale on a cartoon, then that participant's rating was not included in that particular cartoon's average score for the relevant scale. We chose to collect 10 ratings per dimension for each cartoon because humor is largely subjective. Accordingly, we expected participants' impressions of the cartoons to vary, so we interpreted the averages of these ratings as a "wisdom-of-the-crowds" measure of population-level impressions. Perhaps because of the inherent difficulty in making these ratings, though, reliabilities for each scale were low (tone $\alpha = .55$; darkness $\alpha = .54$; funniness $\alpha = .56$; purpose $\alpha = .48$; understandable $\alpha = .61$). To see if there was still some signal in these somewhat noisy ratings, the two experimenters rated a subset of 140 cartoons (20 from each decade), without knowing what decade or ICS score was associated with each specific cartoon, and then examined the reliability between the average of these two ratings and the ratings from the MTurk participants. Reliability across the five dimensions was acceptable: (tone $\alpha = .70$; darkness $\alpha = .75$; funniness $\alpha = .54$; purpose $\alpha = .62$; understandable $\alpha = .66$).

Second, we created an average score for each scale (e.g., darkness) for each month of data, resulting in five month-level ratings for each month (e.g., May of 1972 was reduced to five average ratings: average "darkness" across all of the cartoons that appeared in the *New Yorker* issues from that month, average "funniness" across all of the cartoons that appeared in the *New Yorker* issues from that month, etc.).

Although there were 84 months of cartoon data, only 57 of those had matching ICS scores (before data collection, we were not aware that the University of Michigan had not start conducting the ICS survey until November, 1952, and ran the index quarterly until 1978). Accordingly, for the subsequent analyses using the ICS, we report data from those 57 months (that comprised 4,573 cartoons) that also had ICS data (note that the reliability scores were comparable for these 57 months as they were for the overall sample: tone $\alpha = .55$; darkness $\alpha = .53$; funniness $\alpha = .54$; purpose $\alpha = .45$; understandable $\alpha = .59$).² For unemployment rate data, we use all 84 months of cartoon data. For clarity, we conducted our analyses two ways. First, we report relationships using cartoon-level ratings mapped onto their corresponding monthly ICS scores and unemployment rates. Second, we report relationships between cartoon content, ICS scores, and unemployment rate using average, month-level cartoon ratings and monthly ICS scores and unemployment rates.

Cartoon-level analyses. The two focal variables, tone and darkness, were highly correlated, $r(4571) = .64, p < .001$, so we averaged them together to create a composite “emotional tone” variable ($\alpha = .89$). As noted earlier, lower scores represent heavier (i.e., darker and more negative) cartoons, and higher scores represent lighter (i.e., more positive) cartoons. The three control variables were also highly similar ($\alpha = .78$), so we created a composite variable out of their average. We had hypothesized that there would be a negative relationship between economic trends and the tone of the cartoons (higher scores indicated a more positive or light tone). Indeed, we found such a negative relationship, such that in months in which the economy was perceived as being better as measured by the ICS, cartoons were perceived as being heavier in emotional tone, $r(4571) = -.07, p < .001$. We found a similar relationship with the unemployment rate: in months in which the unemployment rate was higher (i.e., when the economy was doing worse), cartoons were perceived as being lighter in tone, $r(6433) = .04, p < .001$.³

Notably, there was a significant positive relationship between ICS scores and the composite control variable, $r(4571) = .05, p < .001$, and a significant positive relationship between unemployment rate and the composite control variable, $r(6433) = .04, p < .001$. There was also a relationship between time and emotional tone, such that cartoons from more recent years were perceived as being darker in emotional tone, $r(4571) = -.08, p < .001$, and there was a relationship between time and the composite control variable, $r(4571) = .29, p < .001$. As a result, we conducted several robustness checks. First, the relationship between emotional tone and ICS scores held when controlling for time trends (with year being entered as a linear predictor in the regression model), $\beta = -.08, t(4570) = -5.08, p < .001$, and when controlling for month of cartoon (with month being entered as a series of dummy variables), $\beta = -.07, t(4559) = -4.58, p < .001$. To more directly control for season (Hirshleifer & Shumway, 2003; Kamstra, Kramer, & Levi, 2003; Saunders, 1993; Schwarz & Clore, 1983) rather than just month, we also conducted this analysis using a seasonal dummy variable, and results remained unchanged, $\beta = -.07, t(4567) = -4.97, p < .001$.⁴ The relationship between emotional tone and unemployment rate also held when controlling for year, $\beta = .08, t(6432) = 5.29, p < .001$, and the month of cartoon, $\beta = .08, t(6421) = 5.18, p < .001$. Second, the relationship held when additionally controlling for the composite

control variable for ICS scores, $\beta = -.09, t(4558) = -6.39, p < .001$, and for unemployment rate, $\beta = .13, t(6420) = 8.67, p < .001$. Finally, although the sets of cartoons that MTurk participants rated were randomly constructed with cartoons from all decades being represented in each set, we nevertheless added cartoon set as a further control variable, and found that the link persisted for ICS scores, $\beta = -.09, t(4557) = -6.17, p < .001$, and unemployment rate, $\beta = .16, t(6419) = 10.89, p < .001$. See Tables 2 and Table 3 for full regression models.

Month-level analyses. The two focal variables (tone and darkness) were again highly correlated ($r(55) = .84, p < .001$), so we averaged them together and created a composite “emotional tone” variable ($\alpha = .89$). Additionally, because the three control variables were highly similar ($\alpha = .90$), we created a composite variable out of their average. We next mapped the emotional tone scores onto the ICS scores and unemployment rate. We again found that in months in which the economy was perceived as being better (as indexed by the ICS), cartoons were perceived as being darker in emotional tone ($r(55) = -.45, p < .001$). A similar relationship was found for unemployment rate, $r(82) = .25, p = .02$. See Figures 1a and 1b for graphical depictions of these results.⁵ These relationships were much stronger than the ones we found at the cartoon level, presumably because there was less noise at the month level. There was no relationship between ICS scores and the composite control variable, $r(55) = .08, p = .54$, and a trend-level one between the unemployment rate and the composite control variable, $r(82) = .20, p = .07$.

As with the cartoon-level analyses, we conducted two robustness checks. First, the relationship between emotional tone and ICS scores held when controlling for time trends (with year being entered as a continuous predictor in the regression model), $\beta = -.49, t(54) = -4.32, p < .001$, and when controlling for month of cartoon (with month being entered a series of dummy variables), $\beta = -.47, t(43) = -3.69, p < .001$. Similarly, the relationship between emotional tone and unemployment rate held when controlling for year, $\beta = .52, t(81) = 4.04, p < .001$, and when controlling for month of cartoon, $\beta = .51, t(70) = 3.26, p < .001$. Second, the relationship held when additionally controlling for the composite control variable for ICS scores, $\beta = -.51, t(42) = -3.54, p < .001$, and unemployment rate, $\beta = .73$,

² Furthermore, the average of these two experimenter ratings and the ratings from the Mechanical Turk participants were similarly reliable when just using the usable set of cartoons: (tone $\alpha = .67$; darkness $\alpha = .77$; funniness $\alpha = .47$; purpose $\alpha = .61$; understandable $\alpha = .70$).

³ As mentioned earlier, cartoon is coded such that higher numbers represent lighter tone, and lower numbers represent darker tone. As such, the positive coefficient indicates that higher unemployment (a worse state of the economy) is associated with lighter cartoons, and a lower rate of unemployment (a better state of the economy) is associated with darker cartoons.

⁴ For all subsequent analyses in Study 1 and Studies 2a–c, we took this approach of additionally controlling for season by adding in a seasonal dummy variable, and all results remained unchanged.

⁵ Note that we did not include figures for the cartoon-level analyses, as scatterplots with thousands of data points became difficult to visualize and interpret.

Table 2

Linear Regression of Cartoon Tone on Index of Consumer Sentiment (ICS), With Covariates, Cartoon Level

Variables	Model 1			Model 2			Model 3			Model 4			Model 5		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Constant	3.458***	.052		6.519***	.857		6.705***	.922		11.375***	.899		10.970***	.893	
ICS	-.003***	.001	-.071	-.003***	.001	-.075	-.003***	.001	-.071	-.004***	.001	-.093	-.004***	.001	-.090
Year				-.002***	.000	-.053	-.002***	.000	-.057	-.004***	.000	-.152	-.004***	.000	-.147
Control comp.										.285***	.013	.329	.273***	.013	.315
Cartoon set													.000***	.000	.117
R^2		.005			.008			.009			.108			.121	
Adjusted R^2		.005			.007			.006			.105			.118	

Note. Control comp. = control composite. Month dummy variables are included in Models 3, 4, and 5.

* $p < .05$. ** $p < .01$. *** $p < .001$.

$t(69) = 4.01, p < .001$. See Tables 4 and Table 5 for full regression results.

Nonlinear relationships.

Cartoon-level analyses. Finally, it is possible that even though we uncovered linear relationships between the ICS and cartoon tone over time, and unemployment rate and cartoon tone over time, nonlinear trends might also exist. To test for this possibility, we used Simonsohn's (2018) two-lines approach to test for a u-shape in the relationship between ICS and cartoon tone, as well as between unemployment rate and cartoon tone. This method tests whether the regression line for low values of the ICS slopes at a different rate compared with the regression line for high values of the ICS. Here, the regression lines for low values of ICS was significantly negative ($b = -.0005, z = -3.93, p < .0001$), while the regression line for high values of the ICS was not statistically significant ($b = .001, z = .31, p = .76$). For unemployment rate, the regression line for low values (i.e., when the economy is "good") was slightly negative (indicating, if anything, that for very low rates of unemployment, cartoon tone was unexpectedly lighter; $b = -.02, z = -2.59, p = .01$). This unexpected result does not appear to be robust because it did not replicate in the remaining studies reported in this article. Consistent with our expectations, the regression line for high values of the unemployment rate was significantly positive, indicating that when the unemployment rate is high (i.e., when the economy is in a worse state), cartoon tone is lighter in nature, $b = .03, z = 4.26, p = .001$.

Month-level analyses. For ICS scores, the regression line for low values of ICS and emotional tone was negative and significant ($b = -0.004, z = -3.82, p < .001$), while the

regression line for higher values of the ICS and emotional tone was not statistically significant ($b = .01, z = .94, p = .34$). For unemployment rate, the regression line for low values of unemployment rate (i.e., when the economy was in a good state) was trend-level, though did not meet conventional standards of statistical significant ($b = -0.01, z = -1.75, p = .08$). However, the relationship between unemployment rate and emotional tone was significantly positive for higher values of the unemployment rate (i.e., when the economy was in a "bad" state, the emotional tone of cartoons was lighter), $b = .02, z = 4.42, p < .001$.

Taken together, the results from Study 1 suggested that there was a relationship between the health of the economy (using the ICS to measure perceptions of economic health, and unemployment rate to measure actual health), and the tone of *New Yorker* cartoons: linear analyses indicated that worse economic situations were associated with lighter *New Yorker* cartoons. To put these findings into context, if the CSI dropped from its mean of 80.20 to its minimum of 62.00, one could expect that the cartoon tone score would be perceived as .06 points lighter on a 5-point scale (or roughly 80% of a *SD* of cartoon tone scores). Similarly, if the unemployment rate moved from its mean-level of 7.37% unemployment to a historic worst level of 10.80% unemployment, one could again expect that cartoons would be perceived as about .06 points lighter on a 5-point scale (or roughly 80% of a *SD* of cartoon tone scores). The results of the nonlinear analyses offered initial evidence that these relationships were significantly stronger when the economy was perceived to be bad. We elaborate on this finding in the General Discussion.

Table 3

Linear Regression of Cartoon Tone on Unemployment Rate, With Covariates, Cartoon Level

Variables	Model 1			Model 2			Model 3			Model 4			Model 5		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Constant	3.142***	.019		5.871***	.659		5.791***	.661		9.562***	.645		9.265***	.641	
Unemployment	.010***	.003	.044	.017***	.003	.080	.017***	.003	.078	.027***	.003	.126	.026***	.003	.120
Year				-.001***	.000	-.062	-.001***	.000	-.061	-.004***	.000	-.168	-.004***	.000	-.162
Control comp.										.274***	.011	.320	.262***	.011	.306
Cartoon set													.000***	.000	.116
R^2		.002			.005			.006			.101			.114	
Adjusted R^2		.002			.004			.004			.099			.112	

Note. Control comp. = control composite; unemployment = unemployment rate. Month dummy variables are included in Models 3, 4, and 5.

* $p < .05$. ** $p < .01$. *** $p < .001$.

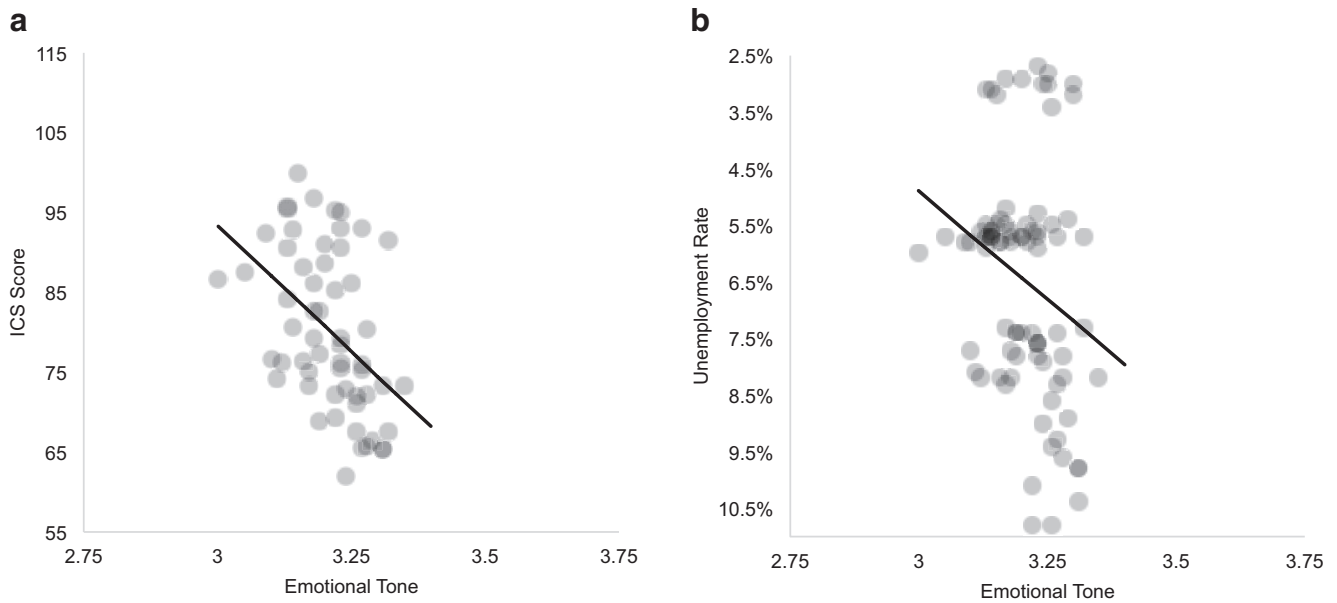


Figure 1. (a) Scatterplot showing the relationship between Index of Consumer Sentiment (ICS) score and average emotional tone of cartoons (at the month level). Higher numbers on the emotional tone scale correspond with lighter tone. Emotional Tone scale scores can range from 1–5, but because the plotted data points represent month-level averages, the average scores ranged from 3 to 3.35. To aid interpretation, we show a reduced range of 2.75 to 3.75 on the x-axis (Study 1). (b) Scatterplot showing the relationship between unemployment rate and average emotional tone of cartoons (at the month level). Higher numbers on the emotional tone scale correspond with lighter tone. Emotional Tone scale scores can range from 1–5, but because the plotted data points represent month-level averages, the average scores ranged from 3 to 3.35. To aid interpretation, we show a reduced range of 2.75 to 3.75 on the x-axis (Study 1).

Studies 2a–c: Archival Analysis of Billboard Hits, Best-Selling Books, and Movies

In Study 2, our aim was to examine the relationship between economic trends and the type of songs, books, and movies that become popular hits. We had again hypothesized an inverse relationship between economic cycles and type of media that became popular.

Method

Study 2a. In Study 2a, we examined the relationship between the perceived state of the economy (as measured by the ICS), the objective state of the economy (as measured by unemployment

rate), and the musical key (i.e., minor or major) of songs that reached number one on the U.S. Billboard Charts across a 58-year period. The University of Michigan has been publishing the ICS since 1952, so we recorded the number one U.S. Billboard Chart hit singles between 1952 and 2014 for which we were able to identify key signatures. We located those key signatures by cross-referencing three websites: onchord.co.uk (that contains key signatures for 9,100 songs); songkeyfinder.com (6,420 songs); and hooktheory.com (6,500 songs). We managed to locate key signatures for 541 number one singles between 1952 and 2014, which represented roughly half of all number one singles during that period. (Key signatures were particularly difficult to locate for

Table 4

Linear Regression of Cartoon Tone on Index of Consumer Sentiment (ICS), With Covariates, Month Level

Variables	Model 1			Model 2			Model 3			Model 4		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Constant	3.464***	.069		6.504***	1.045		6.642***	1.179		7.956**	2.504	
ICS	-.003***	.001	-.446	-.004***	.001	-.494	-.003**	.001	-.469	-.004**	.001	-.508
Year				-.002**	.001	-.334	-.002**	.001	-.353	-.002	.001	-.526
Control comp.										.080	.134	.188
<i>R</i> ²		.119			.308			.379			.384	
Adjusted <i>R</i> ²		.184			.282			.191			.178	

Note. Control comp. = control composite. Month dummy variables are included in Models 3 and 4.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 5
Linear Regression of Cartoon Tone on Unemployment Rate, With Covariates, Month Level

Variables	Model 1			Model 2			Model 3			Model 4		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Constant	3.150***	.024		5.935***	.832		5.885***	.845		8.533***	1.752	
Unemployment	.008*	.004	.253	.017***	.004	.517	.017***	.004	.509	.024***	.006	.732
Year				-.001**	.000	-.429	-.001**	.000	-.424	-.003*	.001	-.927
Control comp.										.192	.112	.447
<i>R</i> ²		.064			.178			.267			.297	
Adjusted <i>R</i> ²		.052			.157			.130			.154	

Note. Control comp. = control composite; unemployment = unemployment rate. Month dummy variables are included in Models 3 and 4.
 * $p < .05$. ** $p < .01$. *** $p < .001$.

songs recorded during the 1950s and 1960s, which accounts for the vast majority of missing songs).

We recorded the date on which each of the 541 retained songs first reached the number one position, the ICS score and unemployment rate that coincided with that date, and whether each song was recorded in a major key (affectively positive) or a minor key (affectively negative). We focused on the first date when the song reached the number one position as this is a purer measure of preferences than subsequent performance, which is influenced to a large extent by subsequent marketing strategies and word-of-mouth that tends to prolong the dominance of initially successful products (for a similar approach, see Alter & Oppenheimer, 2006; Salganik, Dodds, & Watts, 2006). We adopt a similar approach for Studies 2b and 2c. Though there are rare exceptions in Western music, songs performed in a major key tend to sound more upbeat than do songs performed in a minor key (e.g., Williamson, 2013). Indeed, early work found that minor keys are associated with sad, dreamy, and sentimental feelings, while major keys are associated with happy, merry, graceful, and playful feelings (Hevner, 1936). And, holding constant all other aspects of a song (e.g., tempo), Hevner (1935) found that major keys were associated with more happy or light feelings while minor keys were associated with more sad or dark feelings. Consequently, we operationalized songs recorded in a major key as light or positive in tone, and those recorded in a minor key as heavy or negative in tone. Our sample yielded 419 major key songs (77.4%) and 122 minor key songs (22.6%).

Study 2b. We collected data from a website (<http://www.hawes.com/>), which archives #1 *New York Times* bestselling nonfiction hardcover titles each week between 1950 and 2015. Because earlier data were incomplete (and lists were marred to some extent by a series of labor strikes in the 1960s), we compiled data on the #1 bestseller for each week between 1970 and 2015. This approach yielded 136 titles. We included titles from March, July, and November, because publishers tend to systematically vary the types of books they release across the seasons, and we wanted to cover a wide variety of releases and book types (e.g., see Szabla, 2014).

We recorded the date on which each title first reached #1 on the charts, the ICS score and unemployment rate during that week, and the genre to which that title belonged. A research assistant, who was blind to the purpose of the experiment, assigned each book to 1 of 12 genres. A priori, and based on our theoretical framework of what constitutes heavy versus light books, we classified six of the genres as heavy (thriller, spy, mystery, drama, horror, and crime), and the remaining six as light (romance, historical, fantasy,

science fiction, comedy, and adventure). Forty-nine percent of the sample of books was assigned to one of the light genres, and 51% to one of the heavy genres. Both authors of this article inspected these assignments before carrying out their analyses to ensure the books were correctly assigned, and confirmed in informal pilots that the 12 genres were appropriately classified as light or heavy.

Study 2c. We began by creating a database of number one box office movies since 1960 (when such data started being tracked). First, using publicly available data from the Internet Movie Database, AllMovie.com, and BoxOfficeMojo.Com, we recorded the name and genre of the number movie each week between January, 1960 and November, 2014. This approach yielded a dataset of 1,669 movies.

Using the same sources, a research assistant who was blind to the purpose of the study coded the primary genre for each movie (action, adventure, animation, comedy, crime, drama, family, fantasy, horror, musical, romance, science fiction, thriller, war, and western). We resolved inconsistencies—including sequels that were coded differently from original movies—by inspecting the divergent codes, and deciding which of the two was most appropriate. As in Study 2b, based on our theoretical framework of what constitutes heavy versus light movies, we split the resulting genre codes into either lighter (action, adventure, animation, comedy, family, musical, romance, and science fiction) or heavier (crime, drama, horror, thriller, war, and western). Finally, we added the ICS scores and unemployment rate that corresponded to each week captured in the database.

Results

Study 2a. Because our data spanned six decades, we began by examining whether any changes have evolved in musical trends over time. Though the majority of number one singles have been recorded in a major key, the proportion of minor key hits has risen across time. During the 1950s, 1960s, and 1970s, 91% of all number one singles in our database were recorded in a major key; during the 1980s and 1990s, 83% were recorded in a major key; and during the 2000s and 2010s, only 55% were recorded in a major key, $\chi^2(2) = 61.24$, $p < .001$, Cramer's $V = .33$. Given these linear trends, we included a year-of-release time covariate in our primary analysis, using year as a continuous predictor in the logistic regression analysis. To account for any possible month-to-month trends or cycles over time, as in Study 1, we additionally conducted analyses with month dummy variables added into the model. We also used this approach for Studies 2b and 2c.

We conducted a binary logistic regression analysis to examine the relationship between a song's key signature and the state of the ICS when the song first reached number one on the Billboard Chart, and a separate binary logistic regression to examine the relationship between a song's key signature and the unemployment rate. As expected, controlling for the year in which the song was released, songs recorded in a major key were more likely to reach number one on the charts when consumer sentiment was lower (as measured by the ICS), $b = -.02$, $SE = .009$, Wald $\chi^2(1) = 4.48$, $p = .03$, a pattern that remained significant when adding in the month dummy variables, $b = -.02$, $SE = .009$, Wald $\chi^2(1) = 4.19$, $p = .04$. Expressed differently, the ICS score was about 3.1% higher, on average, when minor key songs reached number one on the Chart ($M = 87.41$, $SE = 1.14$, controlling for year) than when major key songs reached number one ($M = 84.76$, $SE = .61$, controlling for year). Similar results were obtained for analyses with unemployment rate. Controlling for the year in which the song was released, songs recorded in a major key were more likely to reach number one on the charts when unemployment was higher, $b = .16$, $SE = .067$, Wald $\chi^2(1) = 5.58$, $p = .02$, a pattern that held when adding in the month dummy variables, $b = .16$, $SE = .068$, Wald $\chi^2(1) = 5.28$, $p = .02$. See Figures 2a and 2b for graphical depictions of the raw data. (In this study, and in the other studies in which we used a time covariate, results persisted though the effects were somewhat weaker when we excluded the time covariate).

Study 2b. As in Study 2a, we examined the relationship between each #1 bestseller's genre tone and the ICS score when that book title reached #1 on the charts, controlling for the year of the book's release. Replicating our earlier results, and controlling

for the year in which the book was released, lighter books tended to reach number one on the list during poorer economic times, $b = -.04$, $SE = .015$, Wald $\chi^2(1) = 5.09$, $p = .02$, a pattern that remained significant when adding in the month dummy variables, $b = -.03$, $SE = .016$, Wald $\chi^2(1) = 4.73$, $p = .03$. Expressed differently, the ICS score was about 6.9% higher, on average, when heavier books reached number one on the list ($M = 86.73$, $SE = 1.59$, controlling for year) than when lighter books reached number one ($M = 81.10$, $SE = 1.61$, controlling for year). Similar, but again weaker, results were obtained for analyses with unemployment rate. Controlling for the year in which the book was released, lighter books showed a trend-level tendency to reach number one on the list during times with higher unemployment, $b = .21$, $SE = .126$, Wald $\chi^2(1) = 2.80$, $p = .09$, a pattern that remained trend-level when adding in the month dummy variables, $b = .22$, $SE = .128$, Wald $\chi^2(1) = 2.85$, $p = .09$. See Figures 3a and 3b for graphical depictions of the raw data.

We also conducted a posttest to assess whether a sample of adults (102 participants from MTurk) agreed with our classification of genres. Specifically, participants read,

some book genres are considered heavy and nonescapist (meaning that they lead to introspection and allow people to confront difficult themes). Other book genres are considered light and escapist (meaning that they don't normally lead to introspection, and they allow people to escape or avoid difficult times).

Participants were then asked to rate each of the 12 book genres on a scale from 1 (*heavy/nonescapist*) to 6 (*light/escapist*), which resulted in an average assignment of heavy/light for each of the 12 book genres. Because our own assignment of genre was based on

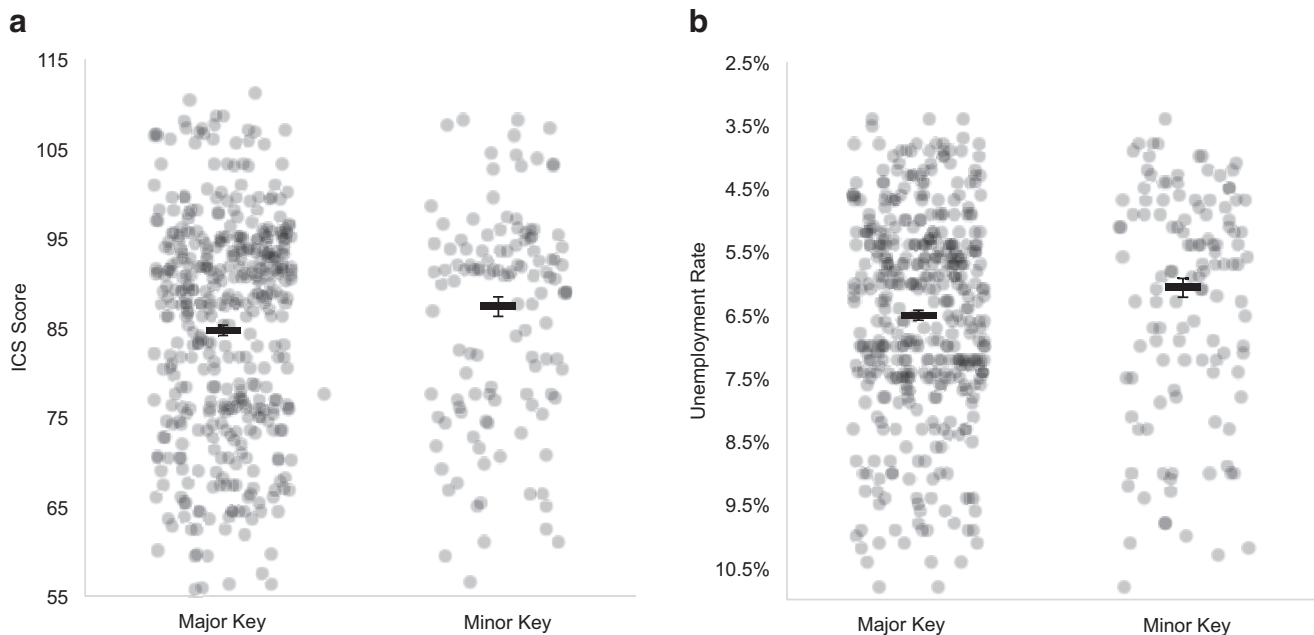


Figure 2. (a) Relationship between Index of Consumer Sentiment (ICS) score and the musical key of songs to reach number 1. Bars in middle represent mean and SE , controlling for year. Jitter has been added to x -axis for ease of visualization (Study 2a). (b) Relationship between unemployment rate and the musical key of songs to reach number 1. Bars in middle represent mean and SE , controlling for year. Jitter has been added to x -axis for ease of visualization (Study 2a).

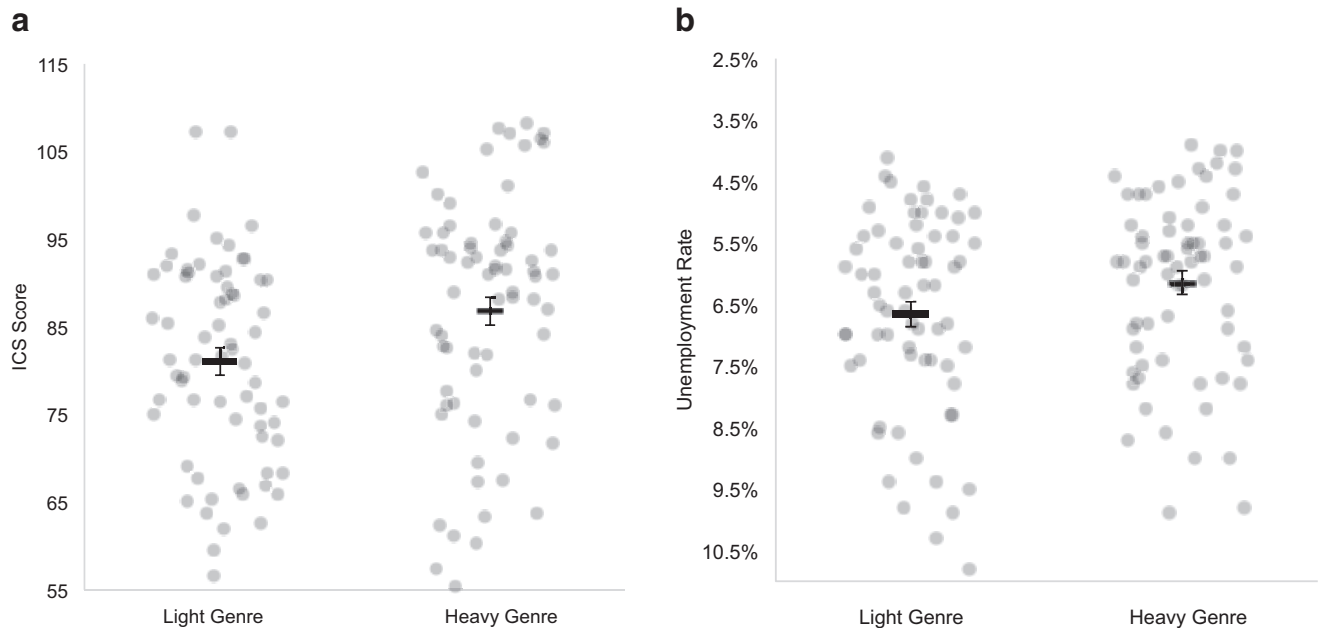


Figure 3. (a) Relationship between Index of Consumer Sentiment (ICS) score and book genre to reach number one. Bars in middle represent mean and *SE*, controlling for year. Jitter has been added to *x*-axis for ease of visualization (Study 2b). (b) Relationship between unemployment rate and book genre to reach number 1. Bars in middle represent mean and *SE*, controlling for year. Jitter has been added to *x*-axis for ease of visualization (Study 2b).

our a priori assumptions (as well as our naïve research assistant's coding of genres), our assignment of genre contained no variance, making it impossible to conduct a traditional reliability analysis using alpha (or with Cohen's κ , if we were to dichotomize the MTurk sample's ratings). As a result, we assessed reliability by simply analyzing whether average ratings from the MTurk sample were below or above the midpoint for heavy/light ratings (i.e., 3.5 on the 6-point scale). In line with our classifications, the MTurk sample labeled crime, drama, thriller, and horror genres as heavy, and romance, fantasy, science fiction, comedy, adventure as light. Unexpectedly, the spy genre was classified as light ($M = 3.95$) and the historical genre was classified as heavy ($M = 2.51$), whereas we had provided the opposite classifications for these two genres. One reason for this discrepancy is that both genres encompass a mix of heavy and light books. For example, our sample of historical books included *Jimmy Stewart and his Poems* (a lighthearted collection of poems by the actor) and *War and Remembrance* (a sweeping account of World War II). Similarly, the spy genre included the *Bourne* series (four escapist action spy films) and *The Odessa File* (a dark spy thriller). As a result, we reran our analyses removing these two genres, and found that our results were unchanged for ICS analyses (controlling for continuous-coded year and dummy-coded month), $b = -.04$, $SE = .018$, Wald $\chi^2(1) = 4.30$, $p = .04$. Furthermore, the mystery genre was coded slightly above the midpoint ($M = 3.70$), and to be conservative, we also reran our analysis after removing that genre and found a similar pattern, $b = -.04$, $SE = .019$, Wald $\chi^2(1) = 3.74$, $p = .05$. When excluding these three genres, however, the relationship between unemployment rate and genre tone dropped to nonsignificance. For ICS scores, then, Study 2b therefore replicated Study 2a, showing

that books with heavier subject matter performed better on the *New York Times* bestseller list when consumer sentiment was relatively high, whereas lighter books performed better when consumer sentiment was relatively low. Results showed a similar, but weaker, pattern for unemployment rate statistics.

Study 2c. As in studies 2a–b, we examined the relationship between the tone of each week's highest grossing movie and the ICS score and unemployment rate when that movie reached #1 on the charts, controlling for the year of the movie's release. Consistent with our earlier findings, controlling for the year in which the movie was released, lighter movies reached number one on the charts during poorer economic times, $b = -.01$, $SE = .005$, Wald's $\chi^2(1) = 4.71$, $p = .03$, which persisted when adding in the month dummy variables, $b = -.01$, $SE = .005$, Wald's $\chi^2(1) = 5.08$, $p = .02$. Expressed differently, the ICS score was about 1.3% higher, on average, when heavier movies reached number one on the charts ($M = 87.16$, $SE = .48$, controlling for year) than when lighter movies reached number one ($M = 85.90$, $SE = .36$, controlling for year). Similar results were obtained for analyses with unemployment rate. Controlling for the year in which the movie was released, lighter movies showed a tendency to reach number one on the list during times with higher unemployment, $b = .09$, $SE = .03$, Wald $\chi^2(1) = 6.91$, $p < .01$, a pattern that remained significant when adding in the month dummy variables, $b = .08$, $SE = .04$, Wald $\chi^2(1) = 4.75$, $p = .03$. See Figures 4a and 4b for graphical depictions of the raw data.

As in Study 2b, we conducted a posttest to assess whether a sample of adults agreed with our classification of genres (using the same sample from Study 2b of 102 participants from MTurk, and the same instructions except that participants rated the 14 movie

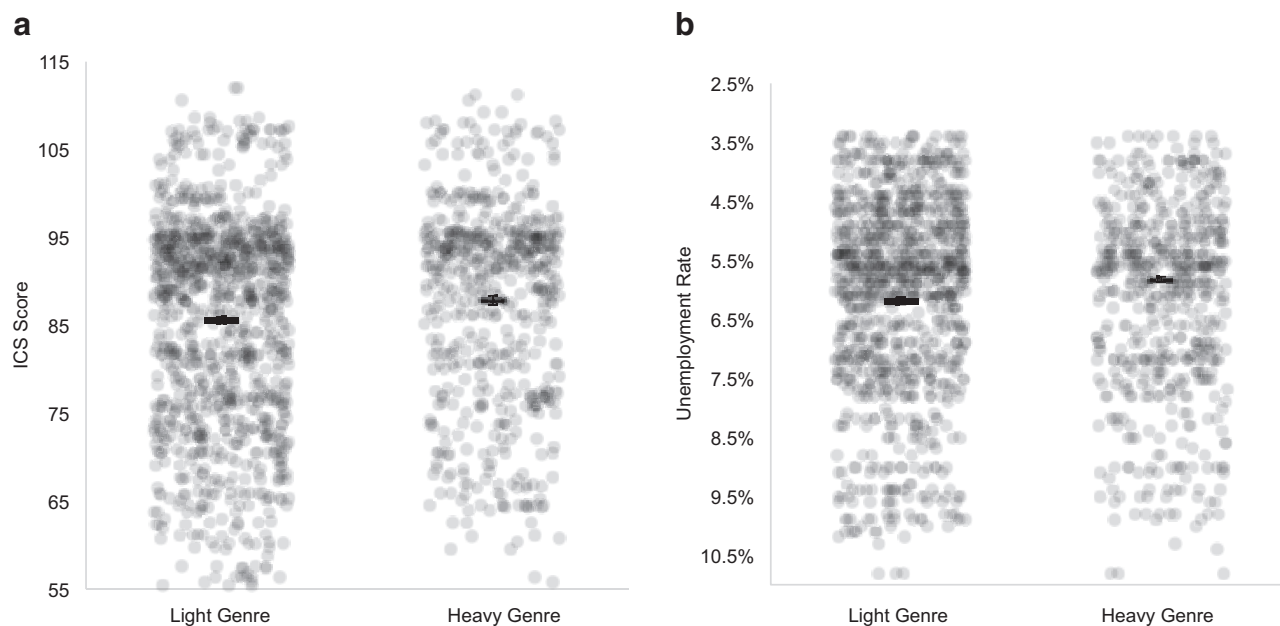


Figure 4. (a) Relationship between Index of Consumer Sentiment (ICS) score and movie genre to reach number 1. Bars in middle represent mean and *SE*, controlling for year. Jitter has been added to *x*-axis for ease of visualization (Study 2c). (b) Relationship between unemployment rate and movie genre to reach number 1. Bars in middle represent mean and *SE*, controlling for year. Jitter has been added to *x*-axis for ease of visualization (Study 2c).

genres rather than the book genres). Again, all classifications from the naïve sample overlapped with our classification, with the exception of Westerns (that we had classified as heavy, but the naïve sample classified as above the midpoint; $M = 4.04$). As in Study 2b, we reran our analyses excluding this genres, and again our results for the ICS remained unchanged when controlling for year, $b = -.01$, $SE = .005$, Wald's $\chi^2(1) = 4.56$, $p = .03$, and $b = -.01$, $SE = .005$, Wald's $\chi^2(1) = 5.10$, $p = .02$, when controlling for month as well. Similar results were obtained for unemployment rate: $b = .08$, $SE = .035$, Wald's $\chi^2(1) = 5.18$, $p = .02$, and $b = .07$, $SE = .04$, Wald's $\chi^2(1) = 3.28$, $p = .07$, when controlling for month as well. These results, therefore, mirrored the patterns of humor (Study 1), music (Study 2a), and book (Study 2b) sales.

Study 3a: Online Study

In Study 3a, our aim was to examine whether economic cycles could have an effect on entertainment choices in a controlled setting with hypothetical outcomes. To do so, we asked participants in an online study to imagine living in a time that was either economically comfortable or uncomfortable, and then measured their propensity to engage with cultural material that was heavier or lighter in nature. We predicted a negative relationship between the type of economy participants thought about and their preference for cultural material.

Method

Participants and design. A sample of 294 participants from MTurk (47% women; $M_{\text{age}} = 36.63$, $SD_{\text{age}} = 12.23$ years) took

part in the study and were compensated 45 cents. In this study and the other experimental study (Study 3b), target sample size was selected to be sufficiently large (two times the minimum recommended per cell; Simmons, Nelson, & Simonsohn, 2013) to identify relationships (if they were present), and was determined before data collection began. The methods for both this study and Study 3b were approved by New York University's Institutional Review Board.

All participants first read,

Please consider that there are some movies that are lighter, a bit more upbeat, and allow for more distraction. There are also some movies that are darker, and allow for more introspection. In the spaces below, please think of the movies you like that you've watched over the last few months. Please list two movies that are "lighter" and two movies that are "heavier."

Underneath this text were four empty text boxes with labels "lighter movie #1," "lighter movie #2," "heavier movie #1," and "heavier movie #2." After completing this task, participants were randomly assigned to one of three conditions: good economy, bad economy, and control. In the "Good Economy" condition, participants were told that "there are some times when the overall economy is good: jobs are easier to come by, wages are higher, and people are more financially comfortable." They were then asked to take a few minutes to write about what it feels like to live in a time like this, and to try to imagine as vividly as possible being part of the economy when times are good. Participants in the "Bad Economy" condition, however, were told that "there are some times when the overall economy is bad: jobs are harder to come by, wages are lower, and people are less financially comfortable."

They were then asked to take a few minutes to write about what it feels like to live in a time like this, and to try to imagine as vividly as possible being part of the economy when times are bad. All participants were then given a text box in which they could write their thoughts. Participants in the control condition were simply asked to click forward to the next task.

Dependent measures. All participants then read,

Now, please consider the movies you listed earlier. Below, please rank (by mousing over and dragging) which movie you'd like to watch most right now, which movie you'd like to watch second most, third most, and last.

The four movies that they had written earlier were then displayed to them in a random order that could be ranked.

Other measures. To assess whether any possible effects of our manipulation held even when taking into account naturally occurring tastes, participants were then asked which of three options best described their movie tastes ("I always watch things that are "lighter" in nature," "I sometimes watch things that "lighter" and sometimes watch things that are "heavier" in nature," and "I always watch things that are "heavier" in nature").

As a measure of their mood state, participants then completed the 20-item PANAS. As a manipulation check, participants in the two experimental conditions were asked how well off they felt financially when they wrote about the economy using a 6-point scale with two anchors (*not very well off*, and *very well off*). Finally, participants completed demographic questions (age, gender, and race).

Results and Discussion

We excluded participants who failed to complete the writing task or the movie listing task (three participants), leaving a final sample of 291 participants. Our manipulation was successful, such that participants in the Good Economy condition felt better off financially ($M = 3.89$, $SD = 1.59$) than did participants in the Bad Economy condition ($M = 2.49$, $SD = 1.47$), $t(176) = 6.08$, $p < .001$, $d = .92$.

Our central question was whether participants would prefer different entertainment options depending on which economic state they considered. To analyze this question, for each participant, we summed the number of times that a light movie was chosen over a heavy movie. For example, a given participant ranked as their two top movies the two light movies that they had previously listed, then they would receive a score of 4, given that the first light movie was ranked over the two heavy movies and the second light movie was also ranked over the two heavy movies; if they never ranked a light movie higher than a heavy movie, then their score would be 0. Higher scores on this metric, then, represent a greater preference for light movies (note that the inverse of this metric simply represents preference for heavy movies). To assess whether participants preferred different entertainment options depending on which economic state they considered, we first conducted a nonparametric Kruskal-Wallis test on the summed rank scores across all three conditions, which indicated that there were in fact differences across conditions, ($\chi^2 = 8.39$, $p = .015$, $df = 2$). Follow-up Mann-Whitney tests indicated that there were no differences in ranks between the control ($Mdn = 2$) and good economy ($Mdn = 2$) conditions ($U = 4,558$, $Z = -.05$, $p = .96$).

Participants in the bad economy condition ($Mdn = 3$), however, ranked the light movies higher than participants in the control condition ($U = 4,447$, $Z = -2.44$, $p = .015$) and good economy condition ($U = 3,060.5$, $Z = -2.62$, $p = .009$).⁶ Figure 5 presents a graphical depiction of this result; for ease of interpretation, we display the average rank of light movies and heavy movies across condition.

Finally, we had collected mood responses via the PANAS, with the expectation that mood differences would emerge as a function of condition. We formed an index by averaging responses to the positive and negative items (reverse-scored), but found no significant differences in overall mood states, $F(2, 288) = 1.02$, $p = .36$, $\eta_p^2 < .01$. Because there were no differences in the aggregate measure, we further decomposed the PANAS into its positive and negative components. Again, there were no differences in either negative mood, $F(2, 288) = 1.76$, $p = .17$, $\eta_p^2 = .02$, or positive mood, $F(2, 288) = .21$, $p = .81$, $\eta_p^2 = .001$.

Study 3b: Experienced Mood as a Mediator

Study 3b had three aims. First, it is possible that one of the reasons that we failed to pick up on changes in mood in Study 3a is that the very act of ranking a list of self-generated movies (a pleasurable task) could have in itself wiped out the mood changes brought on by our manipulation. Accordingly, in Study 3b, we aimed to use a entertainment choice task that was less involved and subtler: participants were asked to think about books, movies, and

⁶ Even though the movie ranking should be analyzed with a nonparametric test, for illustration purposes, we also used a more standard repeated-measures ANOVA. Here, we first computed the average light movie ranking based on the ranking of the two light movies, and also computed the average heavy movie ranking based on the ranking of the two heavy movies. Average rankings could range from 1.5 (e.g., if the two light movies were ranked in the number 1 and 2 spots) to 3.5 (e.g., if the two light movies were ranked in the number 3 and 4 spots): lower rankings are indicative of greater preference to watch a given movie. We then conducted a repeated-measures ANOVA with one within-subjects factor (movie type: light, heavy) and one between-subjects factor (condition: good economy, bad economy, and control). Results indicated that there was a main effect of movie type, $F(1, 288) = 10.70$, $p = .001$, $\eta_p^2 = .04$, such that light movies were ranked more desirable ($M = 2.36$, $SD = .75$) than heavy movies ($M = 2.64$, $SD = .75$).

This main effect was qualified by a movie type by condition interaction, $F(2, 288) = 3.77$, $p = .02$, $\eta_p^2 = .03$. We conducted two additional tests to illuminate the nature of this interaction. First, repeated-measures ANOVAs indicated that participants in the control and good economy conditions showed no difference in preference between light and heavy movies, within condition ($F_s < .61$, $p_s > .41$). However, participants in the bad economy condition ranked light movies as more desirable to watch ($M = 2.19$, $SD = .77$) than heavy movies ($M = 2.81$, $SD = .77$), $F(1, 97) = 16.25$, $p < .001$, $\eta_p^2 = .15$. Second, a one-way between-subjects ANOVA indicated that there was a significant difference in light movie rankings across condition, $F(2, 288) = 3.77$, $p = .02$, $\eta_p^2 = .03$, with contrast tests indicating that participants in the bad economy condition ranked light movies significantly higher than participants in the good economy and control conditions ($t_s < -2.25$, $p_s < .03$). Similarly, an additional one-way between-subjects ANOVA indicated that there was a significant difference in heavy movie rankings across condition, $F(2, 288) = 3.77$, $p = .02$, $\eta_p^2 = .03$, with contrast tests indicating that participants in the bad economy condition ranked heavy movies significantly lower than participants in the good economy and control conditions, ($t_s > 2.25$, $p_s < .03$). More important, we found that when controlling for the type of movies that participants claim to usually watch, the movie type by condition interaction remained significant, $F(2, 287) = 3.70$, $p = .03$, $\eta_p^2 = .03$.

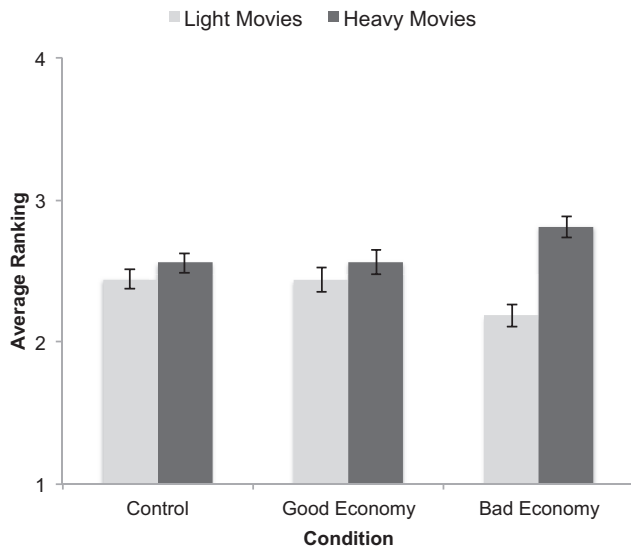


Figure 5. Average ranking for light and heavy movies, by condition (Study 3a). Lower ranking is associated with a stronger preference for watching a given type of movie. Error bars represent SEM.

songs that were more or less “escapist” (i.e., light), and then indicate their preferences. Second (and related), we sought to examine whether the general patterns from Study 3a replicated in this subtly different context. We again predicted a negative relationship between the type of economy participants thought about and their preference for cultural material. Finally, in a separate set of questions, we aimed to assess the natural relationship between financial constraint and preference for heavy versus light media.

Method

Participants and design. There were 127 participants from MTurk (43% women; $M_{\text{age}} = 37.11$, $SD_{\text{age}} = 11.52$) took part in the study and were compensated 50 cents. Participants were randomly assigned to one of two conditions: good economy and bad economy. These conditions were identical to the ones used in Study 3a.

Dependent measures. Next, participants were given the following instructions:

Now, please consider that there are some books, movies, shows, etc. that are more “escapist,” in that they help people step away from the present moment. There are also books, movies, shows, and so forth that are more “nonescapist,” in that they are a bit deeper and allow people to think about life in broader terms.

Participants were then asked four questions about their preferences: “Which type of material do you think you could handle best right now?,” “Which type of material do you think you’d prefer to engage with right now?,” “Which type of material do you think you’d prefer to purchase right now?,” and “Which type of material do you think you’d prefer to engage with later tonight?” Questions were answered on 5-point scales with two anchors (“Something more escapist that allows me to step away from the present moment” and “Something more nonescapist that allows me to think about life more broadly”). Participants were then asked what

best described their motivation “right now” and answered on a 6-point scale with two anchors (“I’d like to read something or watch something in order to escape from the present moment” and “I’d like to read something not to escape but to think more deeply about life”). This latter item was rescaled so scores ranged from one to five, and the resulting five items were combined into one “Preference” index, in which higher scores indicated a stronger preference for a more nonescapist type of experience ($\alpha = .94$).

Next, participants listed the last six media purchases that they made (i.e., books, music, TV shows, movies, etc.) and then on the following screen, rated each of these purchases in terms of their tone on 6-point scales with two anchors (“Fun, lighter, less intense” and “Meaningful, deep, more intense”). The six ratings were averaged to create one Cultural Purchase index, with higher scores being more representative of meaningful, deep, and intense purchases ($M = 3.49$, $SD = 1.29$; range: 1–6; $\alpha = .80$).

Other measures. As a measure of their mood state, participants then completed the 20-item PANAS. As a manipulation check, participants were asked how well off they felt financially when they wrote about the economy using a 6-point scale with two anchors (*not very well off* and *very well off*).

Participants then indicated how well off they felt financially in the last 6 months using the same 6-point scale from the manipulation check. This variable captured how chronically comfortable or constrained participants felt over the previous 6 months. Finally, participants reported demographic information (age, gender).

Results and Discussion

Our manipulation was successful, such that participants in the Good Economy condition felt better off financially ($M = 4.22$, $SD = 1.43$) than did participants in the Bad Economy condition ($M = 2.50$, $SD = 1.39$), $t(125) = 6.84$, $p < .001$, $d = 1.22$. We combined participants’ positive and (reverse-scored) negative mood scores on the PANAS to form a single index of their mood states. Here, participants in the Good Economy condition felt more positive ($M = 4.56$, $SD = 1.57$) than did participants in the Bad Economy condition ($M = 3.93$, $SD = 1.51$), $t(125) = 2.33$, $p = .02$, $d = .42$.

Our central question was whether participants would prefer different cultural material depending on which economic state they considered. As expected, we found that participants in the Bad Economy condition had a stronger preference for escapist material ($M = 2.40$, $SD = 1.06$) than participants in the Good Economy condition ($M = 2.84$, $SD = 1.27$), $t(125) = -2.12$, $p < .04$, $d = .37$.

We then conducted a mediation analysis to examine whether this relationship was driven by the tendency for participants who thought about bad economic times to feel less positive than did participants who thought about good economic times. We adopted the SPSS mediation bootstrapping procedure proposed by Preacher and Hayes (2004), entering the condition variable as the predictor, preference for escapist material as the dependent variable, and combined positive and negative PANAS emotion scores as the mediator. The 95% confidence interval estimating the indirect effect of the predictor on the dependent variable excluded zero [.014, .273], and the relationship between the independent and dependent variables was no longer significant, $t(124) = 1.54$, $p = .13$. Consequently, the relationship between thoughts of bad eco-

conomic times and preferences for lighter media was fully mediated by the negative emotional state inspired by these thoughts.

Finally, to assess the naturally occurring relationship between financial constraints and entertainment choices, we regressed the Past Cultural Purchases index on the financial constraints index and found that the more financially comfortable participants were over the last 6 months, the more likely they were to have purchased nonescapist (i.e., more meaningful, deep, and intense) material, $\beta = .27$, $t = 3.16$, $p = .002$.

General Discussion

Although previous research has examined the effects of broad macroeconomic trends on certain dimensions of behavior, relatively little work has focused on the ways in which entertainment choices change alongside the cycles of the economy. In the current research, we investigated whether macroeconomic trends influence whether people consume light or heavy media. Using archival analyses as well as two controlled online studies, we found evidence for a negative relationship between the state of the economy and the type of entertainment material consumed. When economic factors are negative, people tend to consume lighter media (uplifting songs, escapist books, light-hearted movies, and lighter humor) than they do during economic booms. Notably, we did not confine our analysis to just one entertainment form, but instead, assessed music, movies, books, and cartoons. As a result, we did not use one stringent definition of what constituted “light” or “heavy” material. Rather, we examined music that was in the minor key or major key, movies and books that were escapist or less so, and cartoons that were either deemed dark and more brooding or light and more fun. By doing so, throughout this project, we were able to maintain a broad and ecologically valid perspective on different types of entertainment material.

We began this research program with a keen interest in whether perceived and objective economic trends were related to entertainment choices. To this end, we situated our investigation within the relevant mood and decision-making literature. Taken together, these results provide evidence for a hybrid of psychological theories. While it does seem to be the case that people opt for lighter, possibly more mood-uplifting material when economic trends are negative (by, e.g., consuming more light-hearted, major-key music), the data sources we investigated did not indicate that consumers only gravitated toward positive cultural material when economic trends were positive (as “mood-as-information” theories might suggest). Finally, though only one of our studies investigated the nonlinear relationship between economic conditions and tonal preferences, we found tentative evidence that our effects are strongest when the economy is weakest. Indeed, results from Study 3a were consistent with Study 1’s nonlinear findings. Put differently, people tend to seek lighter fare when the economy is weakest, but are less strongly drawn to heavy options when the economy is strongest.

In summary, the present work makes two major contributions. First, we contribute to the literature that links macroeconomic forces to behavior by demonstrating how inverse relationships can be uncovered in consequential settings. By using both subjective measures as well as objective ones, we show not only that perception of economic health is related to entertainment choice, but also that actual changes in economic indicators are related to entertain-

ment choice. Previous work has examined how economic patterns are related to overall spending patterns; here, we make a contribution by showing how spending on different *types* of entertainment material can change alongside changes in the economy. Second, we contribute to the literature on mood and choice by illuminating a context in which a mood state of one valence may be associated with consumption of material that is oppositely valenced in nature.

Limitations

The present research also involves several limitations that may generate future research opportunities. First, although we suggest that people *consume* different material as the economy shifts, our data also admit the possibility that artists *produce* different material across economic booms and recessions. It is possible, in other words, that consumption patterns could represent the dominant material that was produced or released during a given period of time. In the music world, for example, consuming upbeat songs during down economic times could be the result of people wanting that sort of material more, or it could be the result of record companies and musicians producing more upbeat material during down economic times. Without being able to know the entire universe of songs produced in a given period of time—and when they were produced—this question is rather difficult to answer.

However, we find it unlikely that the production account could solely explain the results we obtained. Namely, the amount of time it takes to produce cultural material varies widely as a function of the type of material (books, e.g., may take longer to write than songs do to record, and once written, can sit in production for 9–12 months before being released to the market). If production alone could account for the results from the present studies, then we would not expect to see similar patterns of results across art forms. Additionally, Studies 3a and 3b—in which research participants were asked to imagine living in economically positive or negative times and then report the type of material that they would like to consume—were solely focused on the consumption and not the production of cultural material. Nonetheless, until future research is conducted on this specific question, a conservative interpretation on the effect of economic cycles on economic choices relies in part on what sort of material is produced or released during a given time. The findings from Study 1 on *New Yorker* cartoons, for example, suggest that there may at least be times when artists produce and immediately release material that is in response to current economic conditions.

Second, our data sources are limited to American consumption of entertainment over approximately the last 50 years. It remains an open question, however, whether the effects that we uncovered would generalize to other cultural contexts and to other historical time periods. It may be the case that the contrasting relationship that exists between economic cycles and tone of entertainment choices is easier to uncover in the modern era, where there is a plethora of entertainment options from which to choose. Would the same relationships be observable in eras when there are fewer options?

Third, we drew on mood-management and broaden-and-build theories to make our predictions regarding the relationship between economic cycles and entertainment choice, with the idea being that economic forces create certain mood states,

leading consumers to want to act on those states (Lazarus, 1991), and then choose entertainment options accordingly. However, a limitation of the archival data sets that we investigated (Studies 1–2c) is that they only allow for a direct test between the state of the economy and the types of entertainment options that are chosen. However, because the subjective index that we chose (the ICS) captures feelings about the economy, and because the objective index that we chose (unemployment rate) is one that consumers pay attention to, we felt confident that the link between economic cycles and mood states was implied. Furthermore, because prior research has found that mood states do regularly engender subsequent action (whether it is to repair those moods (Trope et al., 2001; or broaden one’s psychological horizons; Fredrickson, 2004), it seemed to be a reasonable assumption that the moods brought on by economic cycles led to changes in how consumers responded to those moods. Studies 3a–b provide some initial support for these ideas, but future research and future archival data sets are needed to fully investigate the links in this theoretical account.

Fourth, although we treated the core construct of emotional tone in a continuous manner in Study 1, this construct was dichotomized in Studies 2a–c. This dichotomy mirrored the natural bifurcation of genres into light and heavy (e.g., comedy and action are light, whereas drama and crime are heavy) because many practical production decisions begin with the question of which genre a particular film, book, or song will fall into. That said, measuring tone continuously may have increased the power of our statistical analyses, allowing us to detect additional relationships that may have been hidden. Consequently, because some of the effect sizes uncovered in Studies 2a–c may have been conservative estimates, future researchers should consider continuous measures of tone when examining links between economic cycles and consumer behavior.

Fifth, we acknowledge that the effect sizes varied across the various archival data sets and two experiments, and most were quite small in nature (Cohen, 1992).⁷ To some extent, it makes sense that the effect sizes are relatively small: the tone of an entertainment option that a consumer chooses is most likely influenced by a variety of factors, and the state of the economy is but one of those factors. However, the fact that the effect sizes varied across entertainment domains is possibly interesting fodder for future research: are there certain entertainment forms that are more directly related to consumer mood than others?

Implications and Future Directions

We cautiously note that there may be times when people prefer products that match their moods. We limited our focus to mood states that were by definition broad, diffuse, and long-lasting (e.g., Gross, 2015), though the acute emotions that follow major cultural events, like September 11th, might be associated with consumption patterns that differ from those we reported. Rather than the sort of inverse consumption pattern present in these studies, people might instead consume media that mirrors their transient emotional states, allowing those who are sad, for example, to wallow in their sadness. Future research might investigate this alternative possibility by analyzing the link between major cultural events (both positive and negative) and entertainment consumption patterns measured on daily—or even hourly—levels. Moreover, given the

relatively small effect sizes present across studies, it seems prudent to note that the relationships we observed between economic trends and entertainment choices may not be detected for all people at all times. To this end, it may be useful for future research to determine whether there are particular segments of people that are more or less likely to respond in compensatory ways to economic trends.

The present work focused only on economic trends as an input into mood and preference for cultural material. It is possible, though, that there exist other broad-level phenomena that could have similar effects on entertainment choices. For example, even though economic trends at the end of 2015 were relatively positive (as measured by the CSI), terrorism-related fears in the United States were at levels that had only been higher immediately after the September 11th attacks. Along similar lines, economic performance in the beginning part of 2018 was extremely positive (as measured by the CSI), but anxiety related to a politically divisive climate remained quite high. Future researchers might investigate whether political, social, and cultural events affect entertainment consumption in the same way that economic trends do, and which domain seems to have a stronger effect on consumption patterns.

This work also has important practical implications for content producers, consumers, and policymakers. Though it is notoriously difficult to predict how the economy might shift in the short run, entertainment products tend to take many years to produce, and long run trends are sometimes easier to foresee. In addition to predicting societal and cultural trends, film studios, literary agencies, publishers, and recording agencies should consider how the economy might shift during the production process. If the economy is expected to struggle in the coming years, all else being equal, a comedy is more likely to succeed than is a heavy drama; the same drama might fare better when the economy is healthier. For their part, consumers might benefit from understanding why their preferences shift across time, and why they are sometimes more willing to grapple with heavier content than at other times. Moreover, because heavier films and books, in particular, are more likely to broaden and challenge consumers’ worldviews than are hedonically motivated lighter alternatives, policymakers should account for the possibility that citizens may be more flexible and willing to grapple with novel ideas when the economy is prospering.

On a broad scale, the results from the present investigation demonstrate a relationship between economic outcomes and the types of entertainment products that are consumed: during times of financial adversity, people seem to be most attracted to light, mood-improving products, whereas they are relatively more open to heavier products during financial booms. These results contribute to a growing body of work that examines how judgments, decisions, and behavior change in the face of economic hardships, and broadly add to our understanding of how macroeconomic forces affect individual-level behavior.

⁷ We thank an anonymous reviewer who observed this issue, and also suggested that an internal meta-analysis (McShane & Böckenholt, 2015) could provide a good estimate of the effect sizes across studies. However, internal meta-analyses are only appropriate for research projects with several causal experiments. Given that the current research contains two experiments (and four correlational studies), it was not a good candidate for an internal meta-analysis.

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(Appendix follows)

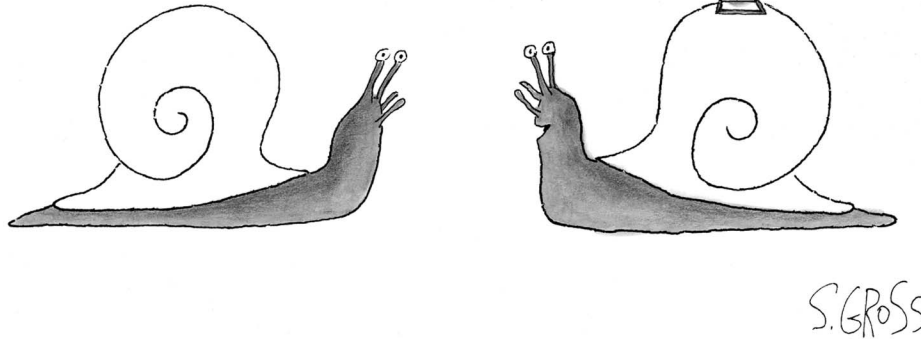
Appendix

Sample Instructions for Study 1

(Actual image used in Study 1 instructions was different from one shown below)

In this study, you're going to be looking at a series of cartoons, and rating each one on five different scales. To walk

you through how you're going to make those ratings, here is a practice cartoon, followed by the ratings scales. Note that if a particular rating is not relevant to the cartoon shown, please click "Not relevant."



"I put in a skylight and it's made a world of difference."

CartoonCollections.com

This image is adapted and used with permission from Cartoon Collections.

The cartoon shown above _____

	1	2	3	4	5		Not relevant
is not funny.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	is very funny.	
is designed to be educational and shed light on something in society.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	is designed to be funny and make you laugh.	
paints a negative picture of humanity.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	paints a positive picture of humanity.	
is hard to understand.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	is easy to understand.	
is very dark	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	is not dark at all.	

The first rating you're asked to make is "How funny is this cartoon?" That should be pretty straightforward—we're just asking you to tell us if you think the cartoon is funny or not. In this case, you'd have to decide whether the joke—that the snail has a skylight in its shell—is funny.

The second rating asks you to think about the purpose of the cartoon. Some are designed to be funny and to make you laugh, and others are designed to tell you something deep and insightful about the world. In this case, the cartoon is probably designed to make you laugh—it's hard to see how it informs your view of the world. If, on

(Appendix continues)

the other hand, the caption said something like, “This weather has led me to put a window in my shell” you might imagine the cartoon is saying something subtle about climate change (and you might score it slightly closer to the “educational” side of the scale).

The third rating asks you to decide whether the cartoon paints humanity in a positive light or a negative light. This can be tricky to decide for some cartoons—it isn’t always clearly making a comment about humanity. In this case, though, you might read into the cartoon that the snails are quite friendly with one another, which could be representative of people in general. Or you might find that interpretation silly, thinking it’s not saying anything about humanity at all. Then you’d give a score somewhere near the middle of the scale.

The fourth rating asks you whether the cartoon is easy or hard to understand. If you do not know that snails have shells, you’d

have to say this is hard to understand—because it’s hard to see why it’s funny without an understanding of their anatomy. If you understood the joke right away, and believe other people would too, you would respond on the “easy” side of the scale.

Finally, the fifth rating asks you how dark the cartoon is. Dark humor is often biting or sarcastic or makes fun of someone or a particular group. It can still be funny, but it has a sharper edge to it. If you think this cartoon is making fun of snails or of people generally, you might answer a bit closer to the dark end of the spectrum. If not, you’d say it isn’t very dark at all.

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