Research Report

THE AFFECTIVE CONSEQUENCES OF EXPECTED AND UNEXPECTED OUTCOMES

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Abstract—*How do people feel about unexpected positive and negative outcomes? Decision affect theory (DAT) proposes that people feel displeasure when their outcomes fall short of the counterfactual alternative and elated when their outcomes exceed the counterfactual alternative. Because disconfirmed expectations provide a counterfactual alternative, DAT predicts that bad outcomes feel worse when unexpected than when expected, yet good outcomes feel better when unexpected than when expected. Consistency theories propose that people experience displeasure when their expectations are disconfirmed because the disconfirmation suggests an inability to predict. According to consistency theories, both good and bad outcomes feel worse when unexpected than when expected. These two theoretical approaches were tested in three studies. The results consistently support DAT.*

Common sense suggests that people feel better following positive outcomes (getting a raise, learning that a suspicious tumor is benign) than they do following negative outcomes (getting fired, learning that the tumor is malignant). Yet the relationship between affect and outcomes is more complex. According to decision affect theory (DAT), how people feel about outcomes is determined in part by counterfactual thinking—comparing what occurred with what might have been (Mellers, Schwartz, Ho, & Ritov, 1997). A bad outcome feels less disappointing when the counterfactual alternative is worse, and a good outcome feels less elating when the counterfactual alternative is better (Feather, 1967, 1969; Johnson, 1986; Linder-Pelz, 1982; van Dijk & van der Pligt, 1997; van Dijk, Zeelenberg, & van der Pligt, 1999; Verinis, Brandsma, & Cofer, 1968). Counterfactual alternatives influence how people feel following outcomes by producing a contrast effect. Moreover, the more the outcome contrasts with the counterfactual alternative, the stronger the emotional response to the outcome. Thus, for example, receiving $5 when expecting $10 feels bad; receiving $5 when expecting $100 feels worse.

Details about counterfactual alternatives can come from social comparisons (comparing personal outcomes with the outcomes of other people) and from temporal comparisons (comparing present with past outcomes). Such details can also come from expectations about the future (Kahneman & Miller, 1986; Olson, Roese, & Zanna, 1996). Supporting DAT, some evidence suggests that outcomes that are objectively the same can elicit quite different emotional responses depending on the expectations. For example, among experimental participants taking part in a series of gambles, unexpected wins were more elating than were expected wins. By contrast, unexpected losses were more disappointing than expected losses. Moreover, feelings about the same outcome differed greatly depending on what else could have occurred. For instance, when people avoided a loss of $56.70, they were elated to get nothing, but when they missed an opportunity to win $56.70, they were disappointed by that same outcome (Mellers et al., 1997, Experiment 1). In short, the same outcome (getting nothing) felt good or bad depending on the alternative outcome ("what could have been").

Even more compelling is evidence that people who are objectively better off than others can nonetheless feel worse. In a study of medal winners at the Olympic games, bronze medalists showed a surprising tendency to be happier than silver medalists. Why? Bronze medalists apparently focused on the alternative of winning no medal, whereas silver medalists focused on the alternative of winning a gold medal (Medvec, Madey, & Gilovich, 1995; see also Medvec & Savitsky, 1997; Mellers et al., 1997, Experiment 2).

Although these studies provide strong support for DAT, it is possible that an entirely different set of forces determines affective responses following expected versus unexpected outcomes. According to consistency theories (Aronson, 1968; Festinger, 1957; Heider, 1958; Swann, 1990), people experience displeasure when they are unable to predict. Therefore, people should feel worse when their expectations are disconfirmed than when they are confirmed because disconfirmation suggests an inability to predict. And people should feel worse after a disconfirmation regardless of whether the outcome is positive or negative. Thus, according to these theories, not only will an unexpected negative outcome feel worse than an expected negative outcome, but an unexpected positive outcome will feel worse than an expected positive outcome.

Support for consistency theory comes from a study by Carlsmith and Aronson (1963) in which participants performed two tasks. The first task was to use cues from the experimenter to predict whether a fluid they would taste would be bitter or sweet. Participants received $0.50 for identifying the fluid correctly, and forfeited $1 for identifying the fluid incorrectly. The second task was to rate the bitterness or sweetness of the fluid. After several trials in which participants had clearly learned the cues, the experimenter surprised them with a sweet fluid when they expected a bitter fluid, or a bitter fluid when they expected a sweet fluid. In line with consistency theory, bitter fluids were rated as more unpleasant (i.e., more bitter) when unexpected than when expected. Likewise, sweet fluids were rated more unpleasant (i.e., less sweet) when unexpected than when expected.

Consistency theory, which proposes that all unexpected outcomes are more unpleasant than expected outcomes, stands in contrast to DAT, which proposes that only unexpected bad outcomes are unpleasant, but that unexpected good outcomes are pleasant. Unfortunately, most prior studies of DAT examined affect following an unexpected bad outcome and did not investigate affect following an unexpected good outcome. Therefore, the prior studies lacked a crucial test of the two theories. The notable exception was the study involving gambles (Mellers et al., 1997). However, the gambles study was highly artificial and investigated responses to an entirely chance event in which participants received probability estimates from a computer rather than forming expectations on their own. This method raises questions about how committed participants were to their predictions and how

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people would feel about expected and unexpected outcomes they likely would encounter in their daily lives.

We conducted three studies to examine competing predictions about how people respond to expected and unexpected good and bad news. Specifically, we examined whether people feel better about an outcome that exceeds the counterfactual alternative, and worse about an outcome that falls short of the counterfactual alternative (as suggested by DAT), or whether both good and bad outcomes feel worse when unexpected than when expected (as suggested by consistency theories). Studies 1 and 2 explored people's affect following expected versus unexpected outcomes using vignettes. Study 3 explored people's feelings experimentally, using a paradigm with high mundane realism that is likely to resonate strongly with people—feedback from a medical test.

STUDIES 1 AND 2

Study 1 employed a between-subjects design in which each of 53 student volunteers read one of four scenarios. The scenarios described a student, J.M., who predicted his score on a classroom exam and subsequently learned his score from the professor. Each participant responded to a single item asking how J.M. would feel (1 = *very unhappy*, 7 = *very happy*) in one of four conditions: (a) J.M. predicted a C and received an A, (b) J.M. predicted a C and received a C, (c) J.M. predicted an A and received an A, or (d) J.M. predicted an A and received a C. A 2 (grade) × 2 (expectation) analysis of variance (ANOVA) revealed significant main effects of expectation, $F(1, 49) = 41.95$, $p < .01$, $\eta^2 = .46$, and grade received, $F(1, 49) = 287.41$, $p < .01$, $\eta^2 = .85$. As shown in Table 1, participants believed that J.M. would feel better receiving an A than receiving a C. However, they also believed that J.M. would feel better if he expected a C and received an A than if he expected an A and received an A, $t(49) = 3.82$, $p < .05$, $\eta^2 = .23$, and they believed that J.M. would feel better if he expected a C and received a C than if he expected an A and received a C, $t(49) = 5.40$, $p < .05$, $\eta^2 = .37$.

Study 2 employed a within-subjects design and asked 24 student volunteers to rank four hypothetical outcomes from 1 ("the outcome that would make you feel the best") to 4 ("the outcome that would make you feel the worst"). The outcomes pertained to an anticipated raise: (a) predicting a $1,000 raise and receiving a $1,000 raise, (b) predicting a $1,000 raise and receiving a $1,500 raise, (c) predicting a $1,500 raise and receiving a $1,000 raise, and (d) predicting a $1,500 raise and receiving a $1,500 raise. A 2 (raise expected) × 2 (raise received) repeated measures ANOVA revealed significant main effects of expectation, $F(1, 23) = 171.4$, $p < .0001$, $\eta^2 = .88$, and outcome, $F(1, 23) = 2{,}209.0$, $p < .0001$, $\eta^2 = .99$. Examination of the ranks (see Table 2) revealed that expecting $1,000 and receiving $1,500 felt best, followed by expecting $1,500 and receiving $1,500, and then expecting $1,000 and receiving $1,000. Participants unanimously reported that expecting $1,500 and receiving $1,000 would feel worst. All ranks were significantly different at $p < .05$.

In sum, Studies 1 and 2 provide support for DAT over consistency theory. Specifically, whereas participants reported that a negative outcome would feel worse when unexpected than when expected, they reported that a positive outcome would feel better when unexpected than when expected. Study 3 moved beyond predicted responses to an expected versus an unexpected outcome by exploring people's actual feelings following a personally relevant outcome that was either expected or unexpected.

STUDY 3

Method

Participants

Introductory psychology students (25 male, 65 female) were run in sessions of 1 to 3 people each and received credit toward a course requirement for participating. All participants within a session were in the same experimental condition.

Procedure

An experimenter wearing a white lab coat and a name tag indicating affiliation with the university hospital greeted participants and presented the study as assessing attitudes about a recently developed home test procedure. The experimenter then described a fictitious medical condition involving a deficiency in thioamine acetylase (TAA) enzyme (Jemmott, Ditto, & Croyle, 1986). The experimenter explained that people vary in the amount of TAA their bodies produce and that low levels of TAA production are linked to several severe medical problems of the pancreas that appear as people reach their 20s. The experimenter explained that participants would test themselves for TAA deficiency and would learn their test results at the end of the hour. After this basic overview, all participants completed a measure of their current affect (Houston, 1990). This measure consisted of six affect labels (upset, distressed, good, happy, elated, and depressed), and participants responded to each by indicating whether

Table 1. *Study 1: Mean affect by condition*

	Grade expected	
Grade received	A	C
A	5.7_c (13, 0.85)	6.8_d (13, 0.38)
C	1.9_a (14, 0.77)	3.5_b (13, 0.97)

Note. Responses ranged from 1 (*very unhappy*) to 7 (*very happy*). Means with different subscripts within rows and columns differ at $p < .05$. For each cell, the *n* and standard deviation are in parentheses.

Table 2. *Study 2: Mean ranks of four possible outcomes*

	Raise expected	
Raise received	$1,500	$1,000
$1,500	1.95 (0.36)	1.08 (0.28)
$1,000	4.00 (0.00)	2.96 (0.20)

Note. Ranks ranged from 1 ("the outcome that would make you feel the best") to 4 ("the outcome that would make you feel the worst"). Standard deviations are in parentheses. All means differ at $p < .05$.

they felt that way "at this moment in time" (1 = *strongly disagree*, 7 = *strongly agree*). All items were summed (after negative items were reverse-coded) to form a single index of mood at Time 1 (possible range = 6 to 42).

Next, *low-risk* participants learned that college students are at a much lower risk for TAA deficiency than non-college students, and that it was unlikely that any of them would test positive for TAA deficiency. *High-risk* participants learned that college students are at a much higher risk for TAA deficiency than non-college students (because of the "college lifestyle") and that it was likely that at least one of them would test positive for TAA deficiency. When only one person participated in a high-risk session, the experimenter said there was a good likelihood that the participant would test positive for TAA deficiency.

Participants then received test strips along with instructions to hold the strips under the tongue for 30 s. When 30 s had elapsed, the experimenter collected the test strips and distributed a questionnaire designed to support the cover story. The experimenter took the strips to an adjoining room ostensibly to be analyzed. After 2 min, the experimenter returned to collect the questionnaire and remind high-risk participants that it was likely that one or more of them would probably have TAA deficiency, and low-risk participants that it was unlikely that any of them would test positive for TAA deficiency. The experimenter then left with the questionnaires.

After 3 min, the experimenter returned and gave each participant a questionnaire and a sealed envelope containing his or her test results. Participants were instructed to complete the questionnaire before opening the envelope. Embedded in the questionnaire was a single item asking participants to estimate the likelihood that they would test positive for TAA deficiency. When participants opened the envelope, they found a single sheet of paper with test results at the top. At the bottom of the sheet were the six affect items they had completed earlier. Half of the participants received bad news—that they had tested positive for TAA deficiency—and half of the participants received good news—that they had tested negative for TAA deficiency. After participants examined their results and completed the affect measure, they were thoroughly debriefed. Their ratings on the affect measure were summed to form an index of mood at Time 2.

Results and Discussion

Because participants were run in sessions, we included session as a nesting variable in the initial analyses. Analyses, however, revealed no effect of session. Thus, subsequent analysis collapsed across sessions. The expectation manipulation was successful. High-risk participants ($M = 4.82$, $SD = 1.83$) were more likely than low-risk participants ($M = 1.98$, $SD = 1.22$) to estimate that they would test positive for TAA deficiency, $t(88) = 9.08$, $p < .0001$, $\eta^2 = .49$. Analysis also revealed that the six-item affect measure was quite reliable, $\alpha = .87$ at Time 1, $\alpha = .90$ at Time 2.

Did expectations influence subsequent affect? The means reported in Table 3 suggest they did. An Expectation × Feedback analysis of covariance, with affect at Time 1 as the covariate, revealed significant effects of affect, $F(1, 85) = 37.00$, $p < .0001$, $\eta^2 = .30$; expectation, $F(1, 85) = 12.01$, $p < .001$, $\eta^2 = .12$; and feedback, $F(1, 85) = 178.87$, $p < .0001$, $\eta^2 = .68$. There were no significant interactions. Planned contrasts revealed that participants in the high- and low-risk conditions differed significantly in their affect at Time 2 both in the test-positive condition, $t(85) = 2.40$, $p < .05$, $\eta^2 = .06$, and in the test-negative condition, $t(85) = 2.47$, $p < .05$, $\eta^2 = .07$. Participants who tested positive for TAA deficiency reported lower positive mood when the bad news came as a surprise than when it was expected. In contrast, participants who tested negative for TAA deficiency reported greater positive mood when the good news came as a surprise than when it was expected.

Table 3. *Study 3: Mean affect by condition*

Test results	Low-risk participants (expect good news)	High-risk participants (expect bad news)
Negative (good news)	32.7_c (22, 4.59)	36.1_d (22, 4.76)
Positive (bad news)	20.1_a (23, 6.29)	23.3_b (23, 5.51)

Note. Means are adjusted for affect at Time 1. Higher numbers reflect more positive affect. Means with different subscripts within rows and columns differ at $p < .05$. For each cell, the n and standard deviation are in parentheses.

In sum, the results again provide experimental support for DAT over consistency theory, this time with a task that was personally relevant and highly involving to participants. Bad outcomes felt worse when unexpected than when expected, whereas good outcomes felt better when unexpected than when expected.

GENERAL DISCUSSION

The results from these three studies provide strong support for DAT. According to DAT, how people feel about outcomes is influenced in part by contrasting what occurred with the counterfactual alternative. In our research, the counterfactual alternative was prompted by participants' expectations. Bad news felt worse when unexpected than when expected. In contrast, good news felt better when unexpected than when expected. Indeed, the relationship between expectations, outcomes, and feelings can be summarized simply: People feel bad when their outcomes fall short of their expectations and feel elated when their outcomes exceed their expectations.

How can the findings of Carlsmith and Aronson (1963) supporting consistency theory be reconciled with the findings supporting DAT? Closer inspection of Carlsmith and Aronson's study suggests that it also may be explained in terms of contrasting the obtained outcome with the counterfactual alternative. However, unlike the studies exploring DAT, in which the unexpected outcome could be viewed as more or less good or bad depending on the counterfactual alternative, in Carlsmith and Aronson's study, the unexpected outcome could only be viewed as bad. Specifically, in their study, the emphasis was on identifying the fluids accurately. Participants stood to benefit financially if their expectations were confirmed and suffer financially if their expectations were disconfirmed. Receiving an unexpected fluid—even a sweet one, when expecting a bitter one—was always undesirable because it meant the loss of money. Thus, participants rated an unexpected fluid as less tasty (i.e., as more bitter or less sweet) because it was not the fluid they wanted to taste.

The notion that expectations influence how people feel about outcomes is echoed in a number of contemporary expressions, such as "Don't get your hopes up" and "Expect the worst and you will never be disappointed." Bad news is more unpleasant and good news is more pleasurable when it comes as a surprise than when it is expected.

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