

Hours of Happiness and Days of Despair: A Study of Valence Asymmetry

Eva Gilboa-Schechtman and Andrew Ortony
Bar-Ilan University, Israel, and Northwestern University, USA
e-mail: gilboae@econ.bu.edu

One of the implications of Frijda's (1988) "law of hedonic asymmetry" is that negative affective states persist longer than positive ones. And indeed, this prediction has received support in at least two domains: people *recall* their negative emotions as lasting longer than their positive ones (e.g., Ricci-Bitti & Scherer, 1986; Frijda, Mesquita, Sonnemans & van Goozen, 1991), and people *expect* their emotions to show the same asymmetry (e.g., Gilboa & Revelle, 1994). However, people's recollections and predictions about the duration of emotions are not necessarily accurate reflections of the *actual* duration of emotional experiences. In fact, there is evidence that our mental models of emotional life are not very accurate representations of our emotional experiences (e.g., Rime, Phillipot & Cisamolo, 1990). On the other hand, others (e.g., Levine, 1997) have argued that people are quite accurate in recalling specific features of their emotional reactions. Given these contrasting views, how does one explain asymmetries in recall of emotion duration? Do they reflect asymmetries in the original experiences, or are they by-products of reconstructive memory processes? The present study tested the proposition that differences in reported duration are due to asymmetries in the original experiences. To do this, we used a mood-induction paradigm wherein participants rated their moods immediately after, and several minutes after positive and negative moods had been induced. Our hypothesis was that, in addition to finding asymmetries in the recollection of emotions, participants would experience more protracted

affective states after negative mood induction than after positive mood inductions.

Method

Participants and Design

Participants (N=266) recalled a neutral autobiographical experience and then rated their mood to provide baseline data. For the mood induction procedure (MIP), they then recalled and "relived" (Salovey, 1988) a positive (or negative) emotional event and rated it on intensity, duration, and recency, and again rated their mood (the immediate rating). Then followed an Emotion Stroop task (details of which are not relevant here), after which participants again rated their mood (the delayed rating). This procedure was repeated for the other valence. MIP valence was a within-subjects factor in the design, with the order of positive and negative conditions (NP or PN) counterbalanced across subjects.

Results and Discussion

Recall Data. Table 1 presents the data for recalled intensity, duration, and recency¹ of the emotions associated with the experience they recalled.

Intensity, and logarithmically-based duration and recency ratings were each analyzed using 2 (Valence: Positive vs. Negative) X 2 (Order of recall: PN vs. NP) ANOVAs.

TABLE 1: Means and standard deviations of recalled intensity, duration, and recency

	Positive		Negative	
	NP (N=144)	PN (N=122)	NP (N=144)	PN (N=122)
Mean intensity	70.8 (21.)	69.5 (18.)	72.7 (21.)	77.8 (18.)
Mean duration (log-based)	6.12 (1.9)	5.76 (2.0)	6.86 (2.2)	7.36 (2.0)
Mean duration (days)	0.9	0.5	2.5	5.0
Mean recency (log-based)	9.46 (1.7)	9.40 (2.0)	9.60 (1.8)	10.15 (1.8)
Mean recency (days)	92	84	111	239

Intensity. Negative experiences were rated as more intense than positive ones (75.1 vs. 70.3), $F(1, 264)=10.3$, $p<.01$, particularly when recalled after positive experiences rather than before positive experiences, $F(1, 264)=4.25$, $p<.05$. There was no main effect of Order ($F<1$).

Duration. Negative experiences were rated as having lasted longer (about 3.5 days) than positive ones (about 17 hours), $F(1, 264)=54.1$, $p<.01$. Also, negative experiences recalled *after* positive experiences were rated as more prolonged than negative experiences rated *before* positive ones, $F(1, 264)=7.37$, $p<.01$. Again, there was no main effect of Order, $F<1$.

Recency. Negative experiences were rated as more remote in time than positive ones, $F(1, 264)=10.34$, $p<.01$, occurring on average almost six months (170 days) before the experiment, as opposed to a little under three months (88 days) for positive experiences. The Order X Valence interaction showed

that negative experiences recalled *after* positive experiences were rated as less recent than when recalled *before* positive experiences, $F(1, 264)=4.86$, $p<.01$. Again, no main effect of Order was identified, $F<1$.

Mood Data. Table 2 presents the descriptive statistics for the mood ratings at baseline, immediately after, and several minutes after the MIP. Preliminary analyses indicated no main effects or interactions involving Order. Therefore this factor was omitted from subsequent analyses.

TABLE 2: Means and standard deviations for overall mood ratings

	Baseline	Immediate	Delayed
Positive MIP	-1.42 (33.9)	40.26 (35.9)	0.80 (36.4)
Negative MIP	-1.42(33.9)	-34.2 (33.6)	-15.93 (32.1)

The potency of the MIPs was examined by comparing ratings at baseline with those immediately after the MIPs. This 2 (MIP Valence: Positive vs. Negative) X 2 (Time: Baseline vs. Immediate) ANOVA confirmed that immediately after the MIPs, participants' overall-mood was significantly different from baseline, $F(1,264)=315.7$, $p<.001$. It also revealed that ratings following positive MIPs were higher than those following negative MIPs, $F(1,264)=4.33$, $p<.05$. Finally, a Valence X Time interaction indicated a greater potency of the positive relative to the negative MIPs, $F(1,264)=4.34$, $p<.05$.

Second, differences between immediate and delayed ratings after positive and negative MIPs were examined using a 2 (Valence: Positive vs. Negative) X 2 (Time: Immediate vs. Delayed) ANOVA. Participants experienced less intense affective states several minutes after MIPs than immediately after them, $F(1, 264)= 383.8$, $p<.01$. The main effect of Valence was not significant, $F(1, 264)=2.8$, n.s. As expected, negative moods persisted for longer than positive ones, $F(1, 264)=52.4$, $p<.001$.

Relationship between Mood rating and Recalled Emotional Experiences.

We expected that negative MIPs would have more enduring effects than positive MIPs, and this was clearly the case. However, perhaps this difference was really due to differences in parameters of the recalled emotional experiences rather than to differential effects of MIPs. For example, we noted earlier that the negative emotional events were recalled as having been more intense and as having lasted longer. Maybe such differences contributed to the greater persistence of the negative states induced by reliving those events. To test this, we conducted an analysis of covariance with delayed mood ratings as the dependent variables. In the analysis, we partialled out the effects of intensity, duration and recency associated with positive events from the positive ratings, and those associated with negative events from the negative ratings. Results indicated significant effect of negative duration and of positive intensity only, $F(2,258)= 14.04$, $p<.01$. Importantly, however, even after controlling for all the relevant variables, the difference between delayed negative and positive mood ratings remained significant, $F(1,258)= 10.6$, $p<.001$.

General Discussion

The goal of the study was to determine whether actual emotional experiences exhibit the same kind of asymmetries as have been found in recall data. The results suggest that they do. Specifically, with respect to duration, by the time positive emotions had returned to their baseline levels, negative emotions were still significantly elevated. Second, although the deviation from baseline immediately after mood induction was slightly higher for the positive emotion than the negative cases, delayed ratings of negative emotions were higher than of positive emotions. This finding is consistent with a view of emotion intensity that does not restrict it to peak intensity, but that incorporates other dimensions, such as temporal structure (Frijda, Ortony, Sonnemans, & Clore, 1992).

Our interpretation of the duration and intensity data for the emotional experiences themselves are consonant with the recall data in this experiment. For there, too, negative emotional reactions were reported as having lasted considerably longer and as having been more intense than positive emotions. The fact that we found valence asymmetries in the experience data is consistent with our conjecture that the source of asymmetries in recall data are attributable to analogous differences in experiences.

It is, of course, important to remember that the temporal scales of the recall and experience data in this experiment are quite different: whereas the former is in the order of days, the latter is limited to a few minutes. We think it is interesting that valence asymmetries can be found in such different time scales. This suggests these duration and intensity differences are a stable feature of affective responses. There is a growing consensus from investigators in fields as diverse as personality and mood (e.g., Watson & Clark, 1997), emotional disorders (e.g., Clark, Watson & Mineka, 1994) neuropsychology (e.g., Lane et al., 1997), and animal studies (e.g., Gray, 1994) that there are two partially independent affective systems, one predominantly concerned with positive affect and the other with negative affect. If affect is indeed regulated by two separate systems, it is plausible that the temporal operating characteristics of those systems differ. Specifically, positive and negative emotions could arise and dissipate at different rates. Alternatively, the different rates of dissipation of positive and negative emotions might be related to characteristics of the antecedent events leading to negative vs. positive affective states. Negative emotional states are often experienced when a goal is blocked. This means that events leading to negative states might necessitate the construction of plans to attain the blocked goals. The construction of such plans is a time-consuming activity demanding complex cognitive operations. In contrast, positive affective states are usually experienced when a goal is achieved, so that plan revision and other cognitive operations are less likely to be needed. Thus, negative affective might last longer than positive ones because they are associated with conditions that require more cognitive resources. Finally, it is possible that the longer duration of negative over positive mood states in our study is related to the autobiographical mood induction method. Specifically, it may be that negative memories are reinstated for a longer period of time than positive ones. Our view is that valence asymmetry probably has multiple causes and that because of its importance in understanding emotion processes, further research in this area is well justified.

Notes

1. Response scales included cognitively salient temporal anchors while also forming equally-spaced logarithmic scales. For example, "Several Minutes" is about 2^0 seconds, "15 Minutes" about 2^{10} seconds, "About an Hour" 2^{12} seconds, and so on. All analyses were performed on the logarithmically-based data.

References

- Clark, L. A., Watson, D., Mineka, S. (1994). Temperament, personality and mood and anxiety disorders. *Journal of Abnormal Psychology*, *103*, 103-116.
- Frijda, N. (1988). The laws of emotion. *American Psychologist*, *43*, 349-358.
- Frijda, N. H., Mesquita, B., Sonnemans, J., & van Goozen, S. (1991). The duration of emotions: Emotions, sentiments, and passions. In K. Strongman (Ed.), *International review of emotion and motivation* (Vol. 1, pp. 187-225). New York: John Wiley.
- Frijda, N. H., Ortony, A., Sonnemans, J., Clore, G. L. (1992). In Clark, M. (Ed.), *Emotions: Review of Personality and Social Psychology*, *13*, (pp. 60-89). Sage Inc. Newberry Park, CA.
- Gilboa, E. & Revelle, W. (1994). Personality and the structure of affective responses. In van Goozen, S. H. M. (Ed.) *Emotions: Essays on emotion theory*, (pp. 135-159). Erlbaum, Hillsdale, NJ.
- Gray, J. A. (1994) The neuropsychology of temperament. In Strelay, J (Ed), *Exploration in temperament: International perspectives on theory and measurement: Perspective on individual differences* (pp. 105-128). Plenum Press, New-York, NY.
- Lane, R., Reiman, E. M., Bradley, M. M., Lang, P. J., Ahern, G. I., Davidson, R. J., Schwartz, G. E., (1997). Neuroanatomical correlated of pleasant and unpleasant emotions. *Neuropsychologia*, *35*, 1437-1444.
- Levine, L. J. (1997). Reconstructing memory for emotions. *Journal of Experimental Psychology: General*, *126*, 165-177.
- Ricci-Bitti, P. & Scherer, K. R. (1986). Interrelations between antecedents, reactions, and coping responses. In K. R. Scherer, H. G. Wallbott & A. B. Summerfield (Eds.), *Experiencing emotion: A cross-cultural study* (pp. 129-141). New York: Cambridge University Press.
- Rime, B., Phillipot, P. & Cisamolo, D. (1990). Social schemata of peripheral changes in emotion. *Journal of Personality and Social Psychology*, *59*, 38-49.
- Salovey, P. (1992). Mood-induced self-focused attention. *Journal of Personality and Social Psychology*, *62*, 699-707.
- Watson, D. & Clark, L. A. (1997). Measurement and mismeasurement of mood: Recurrent and emergent issues. *Journal of Personality Assessment*, *68*, 267-296.