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Mood And Decision-Making, A Diary Study Among Entrepreneurs

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ABSTRACT

The purpose of this diary study with a three-month follow up among 67 business starters was to test the influence of positive and negative mood on self-reported decision effectiveness and goal attainment. Intrinsic motivation and scope of attention were included as possible mediating variables. Results of mixed linear model analyses showed a strong positive relationship between mood and motivation at the time of decision making. However, no relationship between motivation and decision effectiveness or goal attainment was found. Only negative mood, and not positive mood, related to entrepreneurs' scope of attention. As predicted, negative mood narrowed the scope of attention. However, a broad scope of attention during decision-making negatively influenced decision effectiveness and goal attainment as assessed three months later, on top of a concurrent positive relationship between positive mood and self-reported decision effectiveness and goal attainment at the time of follow-up.

Mood And Decision-Making, A Diary Study Among Entrepreneurs

In entrepreneurship, fast and effective decision-making is crucial. Entrepreneurs are often faced with uncertain environments and complex decision-making contexts, and the results of their decisions can have far reaching consequences (Covin and Slevin, 1991; Gartner et al., 1992). Since Simon's (1957) introduction of the "bounded rationality" concept, science has mainly focused on the fact that people may lack the cognitive abilities to make the best decisions under such circumstances. This has led to the view of "satisficing behavior" in decision-making; people will try to make the best decision within their limitations (Harrison, 1997). For a long time, the role of affect in decision-making has been ignored. However, recent research has shown that peoples' moods influence the quality of important elements in the decision-making process (Forgas & George, 2001), particularly when faced with choices under uncertainty (Khatri, & Alvin, 2000). To date, much is still unknown concerning the impact of affect on the effectiveness of peoples' decisions. The current investigation aims to increase our understanding of the role affect plays in decision-making through its effect on two possible mediators, namely scope of attention and intrinsic motivation. It is the first attempt to investigate these questions in a field study, among a sample of entrepreneurs.

Conceptual Framework

Research on affect and decision-making can be framed in a broader scientific discourse focussing on the effects of affect on organizational performance. Two theses have generally dominated this field (Staw and Barsade, 1993). First is the *happier but smarter* thesis, which states that positive affect will have a positive impact on performance through increased

motivation. Second is the *sadder but wiser* thesis, according to which people in more negative states will think more realistically and therefore make better judgements. Both theses have generated support in empirical research. Concerning the effect of moods and emotions on decision-making in specific, research has generally been carried out in experimental settings. Moreover, these studies have focused on specific aspects of the decision-making process, rather than decision-making outcomes. Findings suggest that people in a positive state are more creative, integrate information better, experience less anchoring and look at more alternatives (Kahn, & Isen, 1993; Isen, Daubman, & Nowicki, 1987; Estrada, Isen, & Young, 1997). This can lead to better decision-making, because problem definition and generating alternative solutions are crucial steps in decision-making (see Figure 1). However, some authors suggest that people in negative moods will make more accurate judgments because they are more realistic (e.g., Matlin, & Stang, 1978; Lichtenstein, Fischhoff, & Phillips, 1982; as cited in Staw, & Barsade, 1993). Other studies, on the other hand, find that negative moods lead to a narrow focus of attention and failure in searching for new alternatives (Fiedler, 1988, as cited in Mellers, Schwartz, & Cooke, 1998). Hence, there is no consensus on what the effect of mood on decision-making will be, although there seems to be somewhat stronger support for a positive effect.

We assert that positive moods have a positive effect on decision-making outcomes. This assertion is based on the positive psychological “broaden-and-build” theory and more generally on theories on human motivation. We define decision-making outcomes as the effectiveness of operational decisions entrepreneurs make during the start-up phase of their business in terms of goal attainment. We propose that operational decisions are typically made with the aim of reaching specific goals. Several stages in decision-making can be distinguished (see Figure 1), including defining the goal, formulating and choosing alternative strategies to reach this goal,

and finally implementation and evaluating goal attainment. Therefore, the quality of a decision can to some extent be assessed by the extent to which final goals were actually reached.

Broaden- and- Build Theory

The Broaden-and-Build Theory (Fredrickson, 2001) is based on the question why positive emotions and moods survived evolution. Negative moods and emotions prepare us to fight-or-flight, making them key to survival. The contribution of positive states to our survival is less clear. According to Fredrickson, positive states contribute to personal growth and development. They do so, by helping people broaden their thought-action repertoires, the actions and alternatives people can think of and want to carry out. Positive states 'open' peoples' minds, while negative states narrow one's thought-action repertoires (as in the fight-or-flight response). By being able to have broader thought-action repertoires, positive states help increase, or build, peoples' intellectual, physical, social and psychological resources.

In line with the broaden-and-build framework, studies conducted on the connection between (positive) mood and decision-making showed a broader scope of attention in different states of the decision-making process. For example, an investigation among forty-four *internists* who were asked to think out loud during a diagnosis of a patient with a liver disease, found that the internists who were brought to a positive state by receiving some candy showed less anchoring (thinking of one solution and having trouble to see other options) and integrated the information available better (Estrada, Isen, & Young, 1997). In addition, Kahn and Isen (1993) found in a study among *consumers* that participants who were brought in a happy state by getting a gift showed more variety seeking (looking at multiple alternatives). In a study with *students*, where showing a short fragment of comedy induced the positive state, the participants scored

better on a test for creativity (Isen, Daubman, & Nowicki, 1987). In sum, we expect that people in a positive state will have broader thought-action repertoires, and hence will take a broader perspective on possible causes of a problem, or blockades of goals to be reached, as well as possible alternative strategies that might be followed in order to attain a goal. This may lead to better considered decisions, which should improve the effectiveness of decisions in terms of ultimate goal attainment.

Positive Affect And Motivation

In addition to broadening peoples' cognition and action repertoires, theories on human motivation assert that positive moods have a motivational effect, facilitating goal directed behaviour (e.g., Carver & Scheier, 1990). "Motivation is a condition that energizes, moves and focuses towards a goal" (Atkinson, Atkinson, Smith, Bem, & Nolen-Hoeksema, 1999, p. 348). Motivation can be seen as a process that relates to the choice of goals a person is trying to reach and specific behaviours that are carried out to reach those goals (Thierry, 1988). Entrepreneurs who are in a positive moods are therefore expected to be more intrinsically motivated to make decisions. This can be expected to increase the effectiveness of decision-making, because more motivated entrepreneurs would search for more information, spend more time and invest more effort in their work (including decisions).

The Current Study

In sum, we predict that positive mood positively influences decision effectiveness, whereas negative mood negatively relates to decision effectiveness (Hypothesis 1). More specifically, we assert that positive mood predicts a broader scope of attention, whereas a negative mood predicts a narrower scope of attention (Hypotheses 2a and 2b). In addition, positive mood predicts higher

intrinsic motivation to make a decision, whereas a negative mood predicts less intrinsic motivation (Hypotheses 3a and 3b). In turn, a broader scope of attention and higher intrinsic motivation to make the decision were expected to positively influence ultimate decision effectiveness (Hypothesis 4 and 5).

METHOD

Sample and Procedure

The current study was performed among 67 entrepreneurs who had recently started their businesses (74.6% male and 25.4% female). Their average work experience was 17 years. Their businesses existed for an average of 1.76 years. This sample was chosen, because entrepreneurs who recently started a business are faced with important decisions concerning the future of their business, while these decisions need to be made with a shortage of available resources (Sarasvathy, 2001). Non-rational influences are most likely to influence the effectiveness of decision-making under such circumstances.

Participants were recruited from starters registered at the Rotterdam Chamber of Commerce. An email with a brief description of the study was sent to 192 entrepreneurs, after which they were contacted by telephone to check whether they wanted to participate in the study. Sixty-seven agreed to participate (35%).

For a period of 5 days, participants received a daily link by e-mail to an electronic, internet-based questionnaire. The participants were asked to fill in the questionnaires in a fixed order. Personal data were acquired prior to the investigation. After three months, all participants who had reported at least one decision on each of these five days were sent a personal questionnaire, in which their decision was described, including the goal they had indicated the decision served. This second part of the study was used to measure the self-reported

effectiveness of the decision, and goal attainment. Filling in the questionnaires took approximately 10 minutes per day.

Instruments

Apart from demographic and background variables, such as gender, age, and years of work experience, the following psychological constructs were measured.

Mood. Mood was measured with the PANAS- Scale (Watson, Clark and Tellegen, 1988). This questionnaire presents participants with twenty different moods. Ten items related to positive moods (e.g. interested) and ten related to negative moods (e.g. nervous). The participants were asked to indicate whether they had experienced these moods on that day on a five-point scale, ranging from “Not at all” to “Very much”. Cronbach’s alpha for the Positive affect scale was .84; Cronbach’s alpha for the Negative scale was .87.

Scope of attention. This variable was measured by a global-local visual processing task, adopted from Kimchi and Palmer (1982). This task asks participants to choose one of two alternatives that resembled an example. One of those alternatives resembled the example judged by its details, relating to a local (narrow) scope of attention. The other example resembled the example judged by its general features, relating to a global (broad) scope of attention. Since four pictures were shown daily, the participants could score between one and four on “scope of attention”. Cronbach’s alpha = .77.

Motivation. In our study, motivation referred to being intrinsically motivated to make the particular decision at hand. This was measured with nine items from the Intrinsic Motivation Inventory (McAuley, Duncan and Tammen, 1989, Tsigilis and Theodosiou, 2003), adopted for decision-specific motivation. The participants were asked to indicate their degree of agreement

with statements such as: “Today I enjoyed being involved in making this decision”, and “Working on this decision was interesting”, on a five-point scale, ranging from “Not at all” to “Very much”. Cronbach’s alpha = .72.

Effectiveness of decision-making. Two measures were used to assess the effectiveness of decision-making. In the first part of the study, participants had been asked to write down decisions they had made at each specific day of the study. They were free to choose what kind of decision they reported, in the categories “Financial”, “Personnel”, “Marketing”, “Operational” or “Other”. Then they were asked to describe the exact goal they wanted to reach or the problem they were trying to solve, and the results they wanted to see within two to three months. During the follow-up after three months, the participants received an email referring back to the decision they had made, the goal they had specified and the results they had indicated they wanted to reach, and a link to the final questionnaire. This questionnaire asked them to describe shortly what the outcome of their decision was after three months, to indicate 1) to what degree they thought their decision had been effective and 2) to what degree they thought their decision had positively contributed to reaching their goal. They indicated this degree on five-point scales, ranging from “Not at all” to “to a great extent”. Cronbach’s alpha for this 2-item Decision Effectiveness questionnaire = .73.

Goal attainment. Goal attainment was measured using a questionnaire adopted from De Dreu (2006). Participants were asked 1) to indicate on a five-point scale, ranging from “Not at all” to “Very much” to what degree they had reached their goal(s), and 2) to indicate in percentages how far they were away from reaching their goal(s). In this study, Cronbach’s alpha for the Goal Attainment questionnaire = .72.

RESULTS

Table 1 shows correlations of aggregated day-to-day measures of affect, broad scope of attention and decision specific intrinsic motivation in the first week of the study (N=69; in the left diagonal) and disaggregated day-to-day measures by treating each decision as an individual case (in the right diagonal; 105 decisions at T1-5, and 84 decisions at follow-up) with decision effectiveness three months later. As these preliminary analyses show, positive mood at the time of decision making was strongly positively related to intrinsic motivation for making the decision. Scope of attention was not found to correlate with anything in either condition.

Mood at the three-month follow-up had a strong positive correlation with all measures at the time of decision making. Concerning positive and negative affect and scope of attention, it seems plausible that this may be caused by the relatively stable component of affectivity and scope of attention as a personal characteristic. The correlation between decision specific motivation, which is typically expected to be non-stable across situations, is rather unexpected. Finally, goal attainment and decision effectiveness were strongly correlated, which supports the assumption that an effective decision is one that helps decision makers reach their goals.

Aggregating and disaggregating data to investigate relationships has serious limitations, and results may lack validity. On the one hand, one could argue it is meaningless to analyze the relationship between the “average mood” from Monday till Friday with the “average motivation” from Monday till Friday. On the other hand, disaggregating data violates the assumption of independent data across records. A better way of analyzing the data is by means of multi-level analyses, for example, by means of a *mixed linear model analyses*.

Results Of Mixed Linear Model Analyses

To test hypothesis 1, according to which mood influences decision making effectiveness, two mixed linear model analyses were conducted with effectiveness and goal attainment as dependent variables, and positive and negative mood at the time of decision making as independent variables. Mood at follow-up and number of years work experience were entered as covariates, because mood on the day of evaluation at follow-up and work experience both predicted decision effectiveness; mood on day of evaluation: $F(1,54)= 12.43$, $\beta = .73$, $p < .01$; work experience: $F(1,54)= 4.63$, $p < .05$. In addition, mood on the day of evaluation influenced entrepreneurs' evaluation of goal attainment ($F(1,54)= 4.87$, $\beta = .25$, $p < .05$).

The analyses only showed a marginal effect of negative mood on decision effectiveness ($F(1,54)= 3.34$, $\beta = .31$, $T = 1.83$, $p = .07$), but not on goal attainment. In contrast to our hypothesis, the effect was positive. No direct effect of positive mood on either decision effectiveness or goal attainment was found.

Next, Hypotheses 2a and 2b predicted that positive mood would relate to a broader scope of attention, whereas a negative mood would relate to a narrower scope of attention. Results showed partial support. No effect was found of positive mood, but negative mood had a negative influence on scope of attention ($F(1,144)= 5.13$, $\beta = -.37$, $p < .05$).

In addition, fully supporting Hypotheses 3a and 3b, results of mixed linear model analyses showed that both positive and negative mood predicted intrinsic motivation to make the decision in the expected directions. For positive mood, $F(1,72)= 5.99$, $\beta = .41$, $p < .01$, and for negative mood $F(1,72)= 10.55$, $\beta = -.37$, $p < .01$.

In turn, a broader scope of attention and higher intrinsic motivation were expected to positively influence decision effectiveness (Hypothesis 4 and 5). Two analyses were conducted

to investigate these assumptions, with self-reported decision effectiveness and self-reported goal attainment as respective outcome variables. Mood on the day of evaluation and work experience were again entered as covariates. Results showed no support for Hypotheses 4 and 5. Scope of attention significantly predicted decision effectiveness ($F(1,54)= 8.77, \beta = -.26, p < .01$) as well as goal attainment ($F(1,54)= 6.88, \beta = -.17, p < .05$). However, unexpectedly a negative relationship between scope of attention at the time of decision-making and both decision effectiveness and goal attainment during follow-up was found. No relationships between motivation and decision-effectiveness or goal attainment were found.

CONCLUSIONS AND DISCUSSION

The aim of the current study among business starters was to investigate whether moods influence the effectiveness of decision-making, and whether scope of attention and intrinsic motivation for making the decision might be mediating variables. The relationships in a real life entrepreneurial setting appear to be somewhat more complicated than expected. Our results show more evidence in the direction of the “sadder but wiser”, than for the “happier but smarter” thesis.

As predicted, and in line with previous research, negative mood related to both lower intrinsic motivation and a smaller scope of attention at the time decisions were made, whereas a positive mood related to higher intrinsic motivation. This shows that previous findings among other samples and in controlled settings also generalize to entrepreneurs filling in questionnaires. However, in contrast to the broaden and build theory, positive mood at the time of decision making did not relate to a broader scope of attention at the time of decision making.

This study showed no direct relationship between affect at time of decision-making and effectiveness of the decision as assessed three months later. We did find a marginally significant positive relationship between *negative* mood and self-reported decision effectiveness three months later, which may be meaningful given the moderate sample size (N=67). Our results contrast with previous findings showing that people experiencing positive moods tended to perform better on tasks related to decision-making (e.g. Estrada, Isen, & Young, 1997; Kahn, & Isen, 1993; Isen, Daubman, & Nowicki, 1987). A possible explanation for the discrepancy between our results and results from prior studies is that the present study looked at the effectiveness of decision making as a whole in the long term, whereas previous studies had looked at effective performance of specific elements of decision-making in the short term. It is possible that mood influences specific decision-making aspects in a positive way, such as generating more alternative strategies, but these effects might not be crucial for the ultimate effectiveness of many decisions.

More in line with our expectations, positive mood at the time of evaluation did relate to more optimistic evaluations of the effectiveness of the decisions, both asked directly, and in terms of ultimate goal attainment. This is in line with results from previous research that has shown positive mood influences the way we perceive things (Forgas & Bower, 1987; Weiss, Nicholas, & Daus, 1999). It shows that this type of subjective measures may be biased by subjective experiences.

After controlling for work experience and concurrent affect at time of follow up, no relationship between motivation when making a decision and decision making effectiveness at three month follow-up was found. Moreover, a broader scope of attention at the time of decision-making related *negatively* to decision effectiveness at follow-up, as well as self-reported goal

attainment. This means that participants with a narrower scope of attention reported they had made *better* decisions three months later. This corresponds with the marginal significant, direct positive influence of negative mood on decision effectiveness, which also predicted a narrower scope of attention. A plausible explanation might be that a tendency to process and analyze information more elaborately and in detail, whether or not influenced by negative affect, leads to better decisions, at least in the case of starting entrepreneurs. The question of course remains as to whether such more detailed information processing also applied to the specific decisions at hand. Most likely, this effect influences phase one in the described decision making process: defining the problem or goal. With more elaborate analysis of the situation, a better definition of problems may be generated, which in turn may lead to better decisions.

Limitations

This study had several limitations. We aimed to keep our study as dynamic as possible, to do justice to the complex situations entrepreneurs face. A disadvantage of this approach was that a large variety of decisions were reported by our participants, who were free to describe whatever decision they were facing, ranging from strategic decisions to decisions concerning operational problems. Unfortunately the decisions that were reported were so diverse, that it turned out to be impossible to analyse subsets of similar decisions with sufficient power.

Similarly, to determine whether a decision is effective we asked them to what degree a self-chosen goal was reached. A possible concern may be low comparability between decisions and their effectiveness across people and situations.

A more technical limitation relates to the measurement of openness in the global-local visual processing task. The task has been developed for controlled laboratory settings, in which the

stimuli are presented to the participants for only a very short period of time. The internet-based program used for this study did not provide such a service, meaning that participants were free to spend as much time as they wanted to study the stimuli. This affects the validity of the measure. It is designed to measure peoples' first tendency to look at things on a general or detailed level. Without a time limit, instead of measuring this dominant tendency it might have measured something else, such as willingness to study the pictures longer, after which people might shift focus, and for example may see more details than they otherwise might have seen.

Finally, limitations of this study relate to specificity of the sample business starters, (relationships might be different for established entrepreneurs), subjective measurement of constructs, and restricted number of variables. For example, no measures pertained to specific elements of the decision-making process.

Practical And Theoretical Implications And Suggestions For Future Research

Our suggestions for future research relate to the question as to under what conditions a broad scope of attention might negatively influence decision-making effectiveness in the long run. For example, one could wonder whether this is related to the type of decisions addressed in the study. It would also be interesting to look at the specific steps in decision making, and investigate in which steps detailed rather than global processing of information is more effective. Global or detailed processing of information could also be studied more specifically related to decision making. People could, for example, be asked to summarize information that was presented to them in a vignette related to a specific problem, rather than by means of a general test.

Other suggestions relate to avoiding the limitations of the current study, such as using a larger sample, requiring more homogeneity in reported decisions, and putting a time constraint

on the “scope of attention” assessment. Another idea would be to ask other assessors (preferably people from the same organizations) to fill in the questionnaires concerning decision effectiveness and goal attainment.

The results of this study warrant caution concerning practical implications, because they were not in line with the predictions, and hence they are largely data driven. However, most interesting practical implications may relate to the results that a positive mood relates to intrinsic work motivation and concurrent positive evaluations of goal attainment. This may set into motion a positive spiral of setting high goals in the future, work engagement and increase feelings of self-efficacy. In contrast, the tendency to process information in more detail, which was related to negative affect, has been linked to better evaluations of decision effectiveness and goal attainment three months later. For starting entrepreneurs it may therefore be worth while striving for more detailed analysis of the current situation and signs of possible problems, as well as possible alternatives.

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Table 1. Means, standard deviations and correlation coefficients of aggregated day-to-day measures of affect, openness of mind and intrinsic motivation in the first week of the study (t1-t5; left diagonal) and de-aggregated day-to-day measures (right diagonal) with decision effectiveness three months later.

	Mean	Sd.	Positive mood	Negative mood	Intrinsic motivation	Scope of attention	Decision effectiveness	Goal attainment	Positive Mood at follow-up	Negative Mood at follow-up
1. Positive Mood t1-t5	3.51	.42		-.04	.39**	.02	.00	-.06	.18*	-.04
2. Negative Mood t1-t5	1.82	.52	.04		-.09	-.17**	.09	.20	-.27**	.36**
3. Intrinsic Motivation t1-t5	3.63	.39	.43	-.01		-.00	-.05	-.13	.27**	-.09
4. Scope of Attention t1-t5	3.72	.46	.11	-.17	.12		.04	-.02	.41**	-.03
6. Decision effectiveness	3.50	.69	.22	.08	-.20	.08		.82**	.32**	-.06
7. Goal attainment	3.25	.41	.15	.25	-.31	-.02	.55**		.10	.20
8. Positive mood at follow-up	3.62	.36	.31	-.32	.33	.56**	.25	.03		-.12
9. Negative mood at follow-up			-.08	.41	-.05	-.03	-.06	.22	-.10	

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

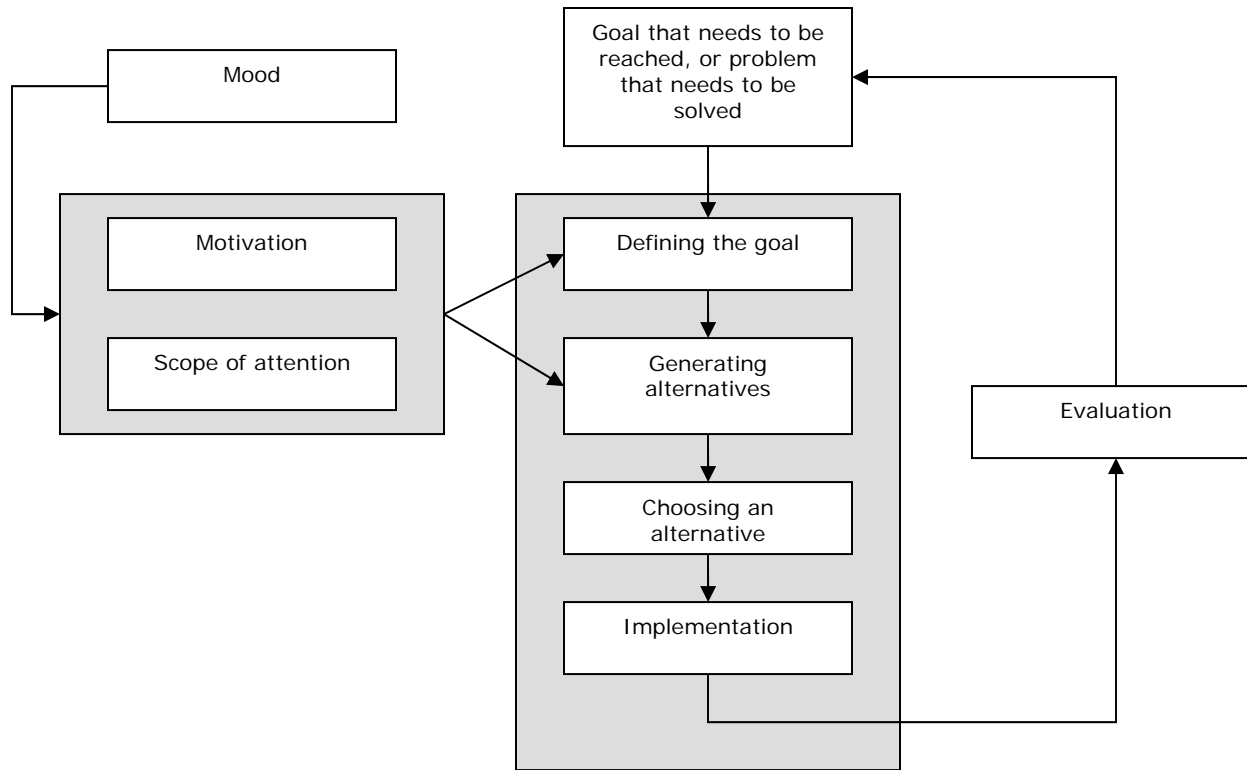


Figure 1. Conceptual Framework