Research on Emotion and Decision Making in Workplace—Base on SPSS and AMOS

Xinlei Wang

Xinlei.Wang@rady.ucsd.edu

University of California, San Diego, Rady School of Management, La Jolla, 92037, US

Abstract-Decision-making is an essential element of organizations' success and employees in organizations, as decision-makers, deal with emotions every day. What role do emotions play in the workplace's decision-making? This research mainly studies the influence of emotions on workplace decision-making. The participants include a total of employees in Chinese organizations regardless of the business size. Data was collected from 314 samples and was analyzed with SPSS and AMOS. Cronbach's Alpha reliability coefficient is calculated, and exploratory factors are analyzed using SPSS23.0, as well as testing Bartlett and KMO spheres. The model is supported by GIF. It is concluded that positive emotions are related to more radical, intuitive, and spontaneous decision making. This making could be increased by positive emotions and decreased by negative emotions. Avoidant decision-making could be decreased by positive emotions and be increased by negative emotions. Spontaneous decision-making could be increased by positive emotions but is not influenced by negative emotions. Organizations could possibly manage employees' emotions to help organizations make better decisions.

Keywords-emotions; decision making; workplace

1 INTRODUCTION

Decision-making is the choice of behavior among all alternatives that have different payoffs. Decision-making is essential to business [1]. Good decision making prioritizes big decisions, saves companies' time and money, makes employees more confident and more committed and proud. It helps businesses accomplish more and faster and gain more reputation. There is also an increase in employee satisfaction [2].

It is important to notice that as a person, we make decisions based on different things and emotion also plays a role. Emotion is a complex experience involving behavior, feelings, and consciousness, which reflects a person's perception of the importance of events [3]. Emotions can also influence our thoughts, judgments, and decision-making [4]. Bechara [5] also mentioned that the decision-making process depends on neural substrates that regulate emotions and feelings.

However, the majority of the research focuses on negative emotions, and in a social context, negative emotions are suppressed by an arousal environment [6].

ICIDC 2022, June 17-19, Qingdao, People's Republic of China
Copyright © 2022 EAI
DOI 10.4108/eai.17-6-2022.2322851

Also, not much research is related to positive emotions. It was briefly mentioned by Heilman, Cri şan, Houser, Miclea, and Miu that bad moods strengthen risk aversion and happiness reduces risk aversion [6].

As Ashforth and Humphrey said, emotion and rationality are interrelated, and emotion is just like the lifestream of organizations. Emotions can influence group thinking, motivation, and efficiency [7].

As argued by Lord, Klimoski, and Kanger, strong emotions may lead to short cognitive processing and cause inconclusive actions [8]. Maclaren's work is thoroughly examined by Maclaren. In his book, he points out that emotions are vital for thinking, acting, and working [9].

Although emotion is so important both for decision making and in the workplace, there is little research linking these two areas together. There has been little research on emotions and decision making in the workplace. Gaudine and Thorne point out that in organizations, employees with positive emotions tend to make more ethical decisions [10]. To fill in the gap, this paper conducted a study to study the role of emotion in decision making in the workplace in the hope of finding out whether emotion could be managed to make a better decision.

2 ANALYSIS

2.1 Methods

400 copies of the survey were sent out randomly to organizations in China. Participants are required to complete the two-part survey and send it back to me. The survey contains two parts, the first part involves the questions about emotions and the second part involves questions of decision making. The first part of the survey applies The PANAS questionnaire to measure employees' general emotions—how they feel on average[11].

The second part of the survey used Spicer and Sadler Smith's general decision making Likert scale[12], which divided decision making into five categories: rational, intuitive, dependent, avoidant, and spontaneous. Each dimension was analyzed in this research.

Hypothesis: Positive and negative emotions would influence business decision making.

2.2 Participants

Participants are employees (leaders and non-leaders) in several different sized organizations. A total of 400 copies of survey were randomly sent out to different companies in China. 378 people responded. A Total of 313 returned surveys were valid and then analyzed.

3 MEASUREMENTS

3.1 Analysis description

In this study, a total of 313 valid samples were analyzed and collected. These samples contains the basic information of the respondents including education level, age, gender, working hours as well as monthly income 172 were male(55%) and 141 were women (45%). All of them are employees from different sized organizations in China.

3.2 Reliability Analysis

Reliability analysis is a method to study the commonality of various variables, which uses Cronbach's Alpha reliability coefficient to test and questionnaire survey. Generally, the reliability of Cronbach's Alpha coefficient value is greater than 0.7.

TABLE 1. RELIABILITY ANALYSIS

Variable	Item	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
Positive Influence	PA1	0.815	0.947	0.953
	PA2	0.79	0.948	
	PA3	0.738	0.95	
	PA4	0.745	0.95	
	PA5	0.756	0.95	
	PA6	0.747	0.95	
	PA7	0.773	0.949	
	PA8	0.824	0.947	
	PA9	0.875	0.944	
	PA10	0.908	0.943	
Negative Influence P2	NA1	0.743	0.941	0.946
	NA2	0.765	0.941	
	NA3	0.74	0.942	
	NA4	0.734	0.942	
	NA5	0.781	0.94	
	NA6	0.71	0.943	
	NA7	0.774	0.94	
	NA8	0.77	0.94	
	NA9	0.812	0.938	
	NA10	0.909	0.934	
rational	R1	0.79	0.879	0.906
	R2	0.752	0.889	
	R3	0.724	0.893	
	R4	0.758	0.886	
	R5	0.803	0.876	
intuitive	I1	0.79	0.851	0.889
	I2	0.784	0.853	
	I3	0.729	0.865	
	I4	0.643	0.884	
	I5	0.707	0.871	
dependent	D1	0.677	0.839	0.865
	D2	0.626	0.851	
	D3	0.712	0.831	
	D4	0.722	0.828	
	D5	0.696	0.835	
spontaneous	S1	0.695	0.837	0.866
	S2	0.645	0.849	
	S3	0.69	0.838	

	S4	0.679	0.841	
	S5	0.734	0.827	
avoidant	A1	0.745	0.862	0.889
	A2	0.708	0.872	
	A3	0.663	0.88	
	A4	0.76	0.859	
	A5	0.785	0.854	

According to table 1, the Cronbach's Alpha coefficient of each variable exceeds the standard value of 0.7, indicating that the variable has a good internal credibility. When the CITC value exceeds 0.5, it means that the measurement item can meet the requirements. According to "Cronbach's Alpha if Item Deleted", it is found that after deleting any of these items, the value of Cronbach's Alpha will not increase, which also shows that these variables have good credibility.

3.3 Factor Analysis

3.3.1 Independent variable factor analysis

Analyzing exploratory factors can be achieved by using SPSS23.0, as well as testing Bartlett and KMO spheres. In the table, the results are shown below.

TABLE 2. BARTLETT'S AND KMO TEST

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		**0.963**
Bartlett's Examine	Chi-Square	5150.248
	Sig.	000
	df	190

According to table 2, the Bartlett test value is very obvious (SIG.<0.001), and the KMO value is greater than 0.7, which is 0.963. The Barlett value can clearly show that the questionnaire data meets the basic requirements of factor analysis. Therefore, the detailed analysis can use the principal component analysis method to achieve factor extraction. Factors are analyzed by the Maximum Orthogonal Rotation Variance after extracting f common factor by taking the characteristic root greater than 1 as the factor. Following table shows table results:

TABLE 3. FACTOR ANALYSIS RESULTS

	Component	
	PA	NA
PA10	0.906	-0.211
PA9	0.891	-0.157
PA8	0.845	-0.167
PA1	0.838	-0.166
PA2	0.816	-0.167
PA5	0.806	-0.071
PA7	0.789	-0.215

PA6	0.785	-0.14
PA4	0.782	-0.14
PA3	0.763	-0.191
NA10	-0.188	0.913
NA9	-0.176	0.834
NA5	-0.134	0.818
NA7	-0.162	0.803
NA8	-0.175	0.797
NA2	-0.198	0.788
NA3	-0.126	0.782
NA1	-0.146	0.781
NA4	-0.117	0.78
NA6	-0.156	0.749
Eigenvalue	7.035	6.770
% of Variance	35.176	33.851
Cumulative %	35.176	69.027

According to table 3, it can be found that the analysis has two factors. The cumulative explanatory ability exceeds 50%, and the value reaches 69.027%. The total value is 69.027%, which shows that the representativeness of the two selected factors is very good. The factor load factor is also displayed in the above table. From the perspective of each measurement item, the cross load is less than 0.4, and the factor load is greater than 0.5. The corresponding factor corresponds to each item, which shows that the structural validity of the scale is better.

3.3.2 Dependent Variable Factor Analysis

Analyze exploratory factors using SPSS23.0, and test Bartlett's and KMO. The results are shown in the following table:

TABLE 4. BARTLETT'S TESTAND KMO

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		**0.919**
Bartlett's Test of	Approx. Chi-Square	4492.316
	Sig.	300
	df	000

It can be seen from the table 4 that KMO = 0.919, which is greater than 0.7. The more obvious value is Bartlett's test value (SIG. <0.001). The requirement of the analysis factor can be indicated by the Barlett's value to indicate that the questionnaire data is satisfied. In this case, detailed analysis can be achieved by extracting factors and analyzing principal components. factors are analyzed by the Maximum Orthogonal Rotation Variance after extracting f common factor by taking the characteristic root greater than 1 as the factor. Following table shows table results:

TABLE 5. FACTOR ANALYSIS RESULTS

	Component				
	R	A	I	D	S
R5	0.837	-0.116	0.14	0.166	0.132
R1	0.815	-0.174	0.145	0.138	0.16
R4	0.811	-0.077	0.13	0.182	0.11
R2	0.789	-0.184	0.188	0.059	0.147
R3	0.781	-0.134	0.141	0.112	0.14
A5	-0.128	0.839	-0.128	-0.12	-0.118
A4	-0.123	0.823	-0.063	-0.145	-0.178
A1	-0.119	0.783	-0.161	-0.179	-0.16
A2	-0.123	0.769	-0.2	-0.064	-0.132
A3	-0.164	0.735	-0.169	-0.03	-0.124
I2	0.179	-0.133	0.814	0.137	0.171
I1	0.141	-0.255	0.78	0.207	0.183
I5	0.124	-0.178	0.772	0.064	0.165
I3	0.173	-0.171	0.739	0.193	0.215
I4	0.153	-0.064	0.731	0.13	0.149
D4	0.153	-0.107	0.051	0.811	0.083
D3	0.128	-0.076	0.145	0.794	0.099
D5	0.118	-0.126	0.071	0.793	0.087
D1	0.134	-0.108	0.17	0.745	0.121
D2	0.063	-0.072	0.186	0.725	0.113
S5	0.111	-0.162	0.211	0.091	0.785
S4	0.091	-0.126	0.153	0.127	0.764
S3	0.164	-0.188	0.097	0.091	0.764
S1	0.16	-0.11	0.188	0.122	0.756
S2	0.133	-0.116	0.164	0.097	0.727
Eigenvalue	3.632	3.528	3.408	3.343	3.296
% of Variance	14.527	14.114	13.63	13.372	13.185
Cumulative %	14.527	28.641	42.271	55.643	68.828

According to table 5, the analysis shows that there are 4 factors, and the cumulative explanatory power is greater than 50%, which is 68.828%. The total value is 68.828%, which proves that the 4 selected factors are very representative. As shown in the above table, it is the factor loading coefficient, which is greater than 0.5, and the cross load is less than 0.4. The corresponding factors all fall into the corresponding options, which also shows that the structural validity of the scale is good.

3.4 Validation Factor Analysis

3.4.1 Independent Variable

There are 2 dimensions, including 20 measurement topics. After verifying the analysis factors, the following chart is obtained, as shown in figure 1:

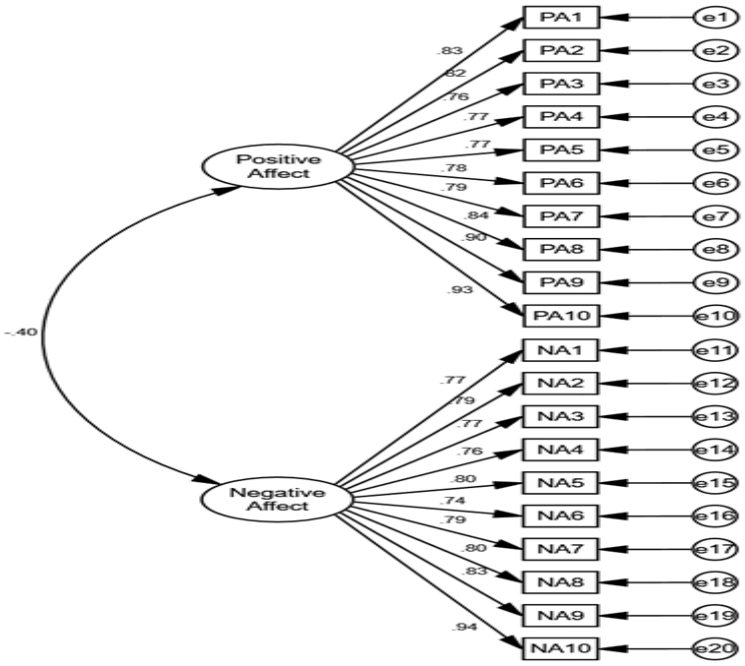

Figure 1. Confirmatory factor analysis model for Independent Variables

TABLE 6. CONFIRMATORY FACTOR ANALYSIS MODEL GOODNESS OF FIT FOR INDEPENDENT VARIABLES

Model fit	Recommended values	Measurement model
DF	——	207.521
CMIN	——	169
CFI	>0.9	0.992
RMSEA	<0.08	0.028
GFI	>0.8	0.938
TLIA	>0.8	0.923
IFI	>0.9	0.992
GFI	>0.9	0.991
CMIN/DF	<3	1.228
SRMR	<0.08	0.027

According to the results in table 6, the value of CMIN/DF is less than 3, which is 1.228; the value of SRMR is less than 0.08, which is 0.028; the value of RMSEA is less than 0.08, which is 0.027; the standards of IFI, AGFI, CFI, GFI, and TLI are all greater than 0.9. All Goodness of Fit (GFI) indexes meet the general research standards. Therefore, this model has good goodness of fit.

TABLE 7. VALIDATION FACTOR ANALYSIS RESULTS

Variable	Item	Factor loading	CR	AVE
Positive Affect	PA10	0.934	0.954	0.674
	PA9	0.895		
	PA8	0.841		
	PA7	0.793		
	PA6	0.775		
	PA5	0.769		
	PA4	0.768		
	PA3	0.762		
	PA2	0.816		
	PA1	0.835		
Negative Affect	NA10	0.939	0.946	0.639
	NA9	0.833		
	NA8	0.796		
	NA7	0.791		
	NA6	0.739		
	NA5	0.803		
	NA4	0.757		
	NA3	0.766		
	NA2	0.789		
	NA1	0.766		

Among the measured index values shown in table 7, the AVE (average variation extraction) is greater than 0.5, the standardized factor load is greater than 0.6, and the CR (component reliability) is greater than 0.7, which indicates that the convergence validity of each variable is good.

3.4.2 Dependent Variable

There are 25 measurement subjects and 5 dimensions. The following figure 2 shows the analysis results of the verified factors.

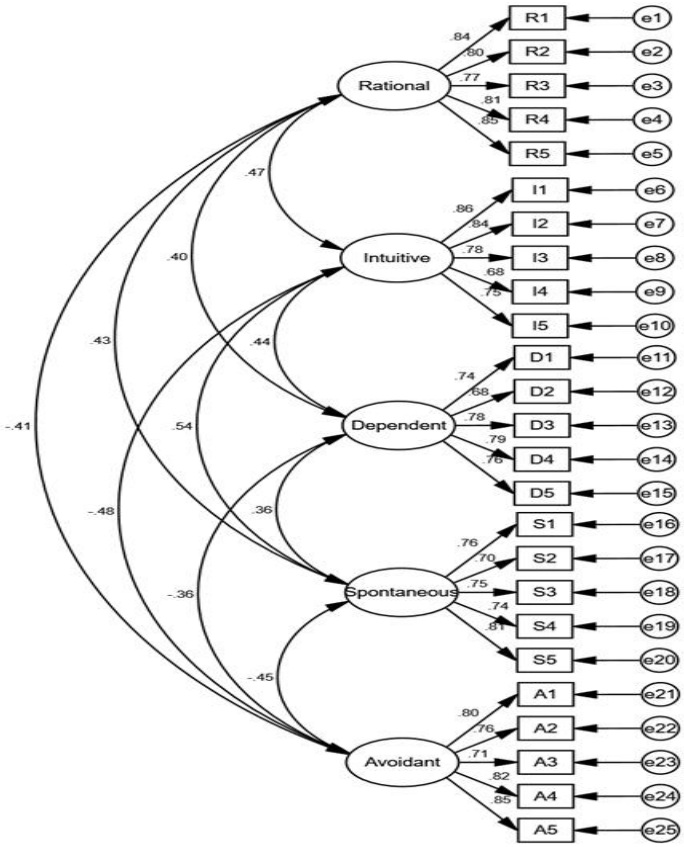

Figure 2. Confirmatory factor analysis model for dependent variable

TABLE 8. VALIDATE AND ANALYZE THE GOODNESS-OF-FIT MODEL OF THE DEPENDENT VARIABLE

Model fit	Recommended values	Measurement model
DF	——	265
CMIN	——	308.454
CFI	>0.9	0.990
IFI	>0.9	0.990
TLI	>0.9	0.989
AGFI	>0.8	0.023
SRMR	<0.08	0.033
RMSEA	<0.08	0.926
CMIN/DF	<3	1.164
GFI	>0.8	0.91

As shown in Table 8, the value of RMSEA is greater than 0.08, which is 0.023; the value of GFI, AGFI, TLI, IFI, CFI reaches the standard value of 0.9; the value of CMIN/DF is less than 3, which is 1.164; the value of SRMR is less than 0.08, which is 0.033. All Goodness of Fit(GFI) indexes meet the general research standards. Therefore, this model has good fitting.

TABLE 9. VALIDATION FACTOR ANALYSIS RESULTS

Variable	Item	Factor loading	CR	AVE
Rational	R1	0.838	0.907	0.662
	R2	0.797		
	R3	0.766		
	R4	0.81		
	R5	0.853		
Intuitive	I1	0.862	0.89	0.62
	I2	0.843		
	I3	0.784		
	I4	0.684		
	I5	0.752		
Dependent	D1	0.742	0.866	0.564
	D2	0.679		
	D3	0.783		
	D4	0.787		
	D5	0.759		
Spontaneous	S1	0.76	0.867	0.566
	S2	0.701		
	S3	0.75		
	S4	0.742		
	S5	0.806		
Avoidant	A1	0.804	0.892	0.623
	A2	0.757		
	A3	0.707		
	A4	0.822		
	A5	0.848		

According to Table 9, the AVE (average variation extraction) value is greater than 0.5, the CR (component reliability) value is greater than 0.7, and the standardized factor load exceeds 0.6, which also proves that the convergence validity of each variable is better.

3.5 Distinguishing Measures

In this study, a more rigorous AVE method was used to discriminate and evaluate effectiveness. According to Fornell and Lacker（Fornell &Lacker 1981）, in order to show there is Discriminant validity between the factors, the correlation coefficient of each factor AVE paired variable must be less than their root, and the standardized correlation coefficient outside the diagonal is greater than the root of each factor AVE. Therefore, the correlation coefficient in this study is a diagonally lower triangle, and the variable is discriminant validity. For details, please refer to the table 10 below.

TABLE 10. DISCRIMINATE VALIDITY

	PA	NA	R	I	D	S	A
PA	0.821						
NA	-.380**	0.799					
R	.326**	-.407**	0.814				
I	.419**	-.365**	.426**	0.787			
D	.247**	-.436**	.356**	.386**	0.751		
S	.503**	-.279**	.389**	.472**	.320**	0.752	
A	-.542**	.363**	-.377**	-.431**	-.310**	-.403**	0.789

3.6 Structural Equation Model

3.6.1 Model Analysis

AMOS 23.0 as well as the maximum likelihood method is used for estimation and calculation respectively. The result is shown in the figure 3 below.

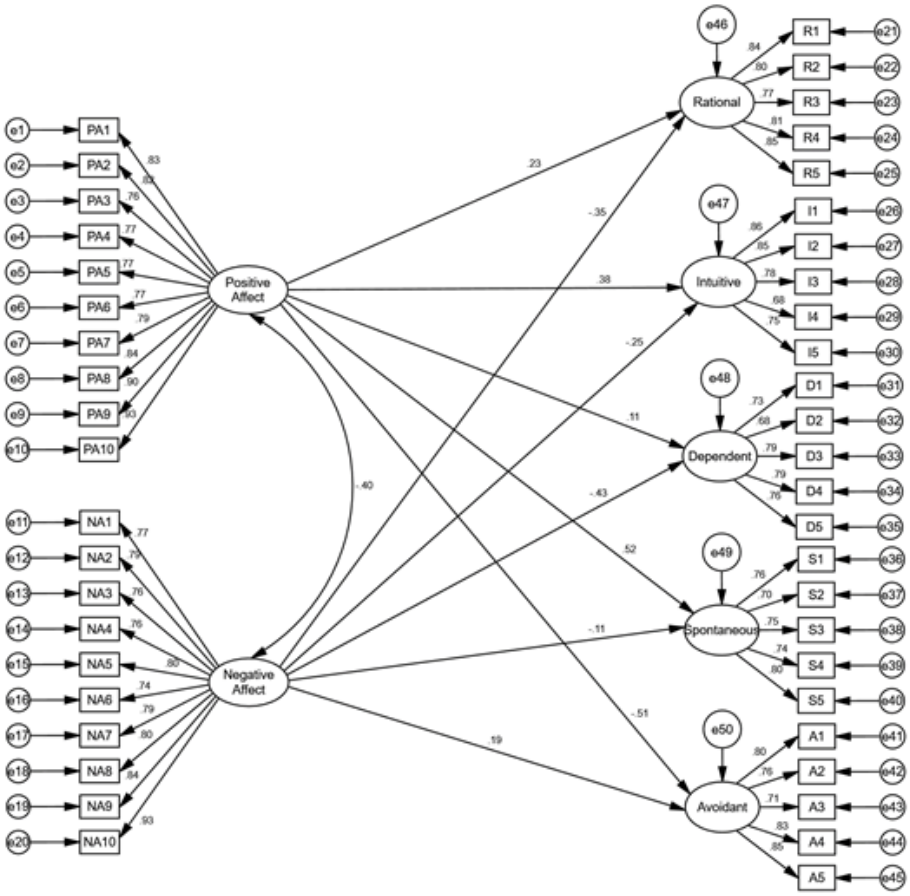

Figure 3. Structural Equation Modeling

3.6.2 Model Goodness of Fit

TABLE 11. CONFIRMATORY FACTOR GOODNESS OF FIT

Model fit	Recommended values	Measurement model
CMIN	——	1184.789
CMIN/DF	——	934
DF	<3	1.269
SRMR	<0.08	0.064
AGFI	>0.8	0.859
GFI	>0.8	0.844
RMSEA	<0.08	0.029

CFI	>0.9	0.974
TLI	>0.9	0.973
IFI	>0.9	0.974

From Table 11, the RMSEA value is less than 0.08, which is 0.029, and the SRMR value is less than 0.08, which is 0.064; CFI, IFI, and TLI values all exceed the standard of 0.9; GFI and AGFI are also within the acceptable range, which is greater than 0.8; CMIN/DF The value is less than 3, which is 1.269, and all the goodness of fit indicators are within the standard range of general research. Therefore, this model has a good matching degree.

3.6.3 Path Coefficient

As shown in Table 12, rationality is significantly affected by the positive effect ($P < 0.05$, $\beta = 0.227$,), so the hypothesis can be confirmed; the negative effect hypothesis is also clearly established ($P < 0.05$, $\beta = -0.351$); Innovation is significantly affected by the positive effect ($P < 0.05$, $\beta = 0.379$), this hypothesis is established; the negative effect hypothesis ($P < 0.05$, $\beta = -0.25$) is established.

Since the positive effect has a significant positive effect on dependence ($P > 0.05$, $\beta = 0.109$), the hypothesis is incorrect; the dependence of the negative effect is very strong ($P < 0.05$, $\beta = -0.433$), so the hypothesis is incorrect;

For avoidant negative effects, the positive effects are significant ($P < 0.05$, $\beta = -0.507$), which shows that the hypothesis is correct; the negative effects show obvious positive effects ($\beta = 0.193$, $P < 0.05$), which shows the hypothesis is incorrect;

For avoidant negative effects, the effect of positive effects is obvious ($P < 0.05$, $\beta = -0.507$), which shows that the hypothesis is correct; the negative effects show obvious positive effects ($P < 0.05$, $\beta = 0.193$), which indicates that the hypothesis is not correct.

TABLE 12. PATH COEFFICIENT

path			Standardized estimates	Unstandardized estimates	S.E.	C.R.	P	Result
Rational	<---	Positive Affect	0.227	0.226	0.06	3.77	***	establish
Rational	<---	Negative Influence	-0.351	-0.386	0.069	-5.606	***	establish
Intuitive	<---	Positive Influence	0.379	0.34	0.055	6.23	***	establish
Intuitive	<---	Negative Influence	-0.25	-0.247	0.059	-4.181	***	establish
Dependent	<---	Positive Influence	0.109	0.092	0.052	1.776	0.076	Not established

Dependent	<---	Negative Influence	-0.433	-0.402	0.063	-6.348	***	establish
Spontaneous	<---	Positive Influence	0.517	0.456	0.058	7.831	***	establish
Spontaneous	<---	Negative Influence	-0.11	-0.107	0.057	-1.881	0.06	Not established
Avoidant	<---	Positive Influence	-0.507	-0.469	0.057	-8.2	***	establish
Avoidant	<---	Negative Influence	0.193	0.197	0.058	3.406	***	establish

4 RESULTS

Form the study, it can be concluded that positive emotions would increase rational decision making negative emotions would decrease .

Rational decision making could be enhanced by positive emotions and be limited by negative decision making.

Intuitive decision making could be enhanced by positive emotions and be limited by negative decision making.

Dependent decision making could be limited by negative decision making but will not be affected by positive emotions.

Spontaneous decision making enhanced by positive emotions but is not affected by negative emotions.

Avoidant decision making could be limited by positive emotions and be enhanced by negative decision making.

5 CONCLUSION

From this research, organizations could elicit more positive emotions from employees, which would allow them to come up with more rational decisions that are important for business. Other dimensions of decision making (intuitive, spontaneous, dependent, and avoidant) are also relevant to business decision making, so organizations may find some way to manipulate employees' emotions to help them, and eventually the organization, make a better decision.

Whether or not participants realize their true emotions in general and the accuracy of the decision-making process they recalled will influence the result of the research. So, a study that does not require participants to recall or report their behavior needs to be conducted.

REFERENCES

[1] Ali,O.E.A.,Magadley,W(2019, March 7). An Exploration of the Relationship Between Emotional Intelligence and Job Performance in Police Organizations. Journal of Police and Criminal Psychology.

[2] Becker, H. S(2020, May 15). Notes on the concept of commitment. American Journal of Sociology.

[3] Brumbrach. Performance Management [M].London: The Cron-well Press.

[4] Bukik,N.O(2010).Emotional intelligence in the workplace: exploring its effects on occupational stress and health outcomes in human service workers. International Journal of Occupational Medicine and Environmental Health .

[5] Burke , M. J.(2003). On the skilled aspect of employee engagement.Industrial and Organizational Psychology.

[6] Chan, S.C.H.,& Mak,W.M.(2010). Benevolent leadership and follower performance:The mediating role of leader-member exchange (LMX).Asia Pacific Journal of Management.

[7] M.S., Garza ,A. S.,& Slaughter,J.E.(1995). Work engagement; a quantitative review and test of its relation with task and contextual performance. Personal Psychology.

[8] David,S.A.(2002).Emotional intelligence: Developmental antecedents,psychological and social outcomes. Doctoral dissertation.University of Melbourne ,Melbourne,Australia.

[9] Dickie C.(2021). Exploring workplace friendships in business: Cultural variations of employee behaviour. Research and Practice in Human Resource Management.

[10] Dotan H.(2001). Friendship ties at work: Origins,evolution and consequences for managerial effectiveness. Los Angeles: University of California.

[11] Garder L J, Stough C(1988). Exploration of the relationship between workplace,emotional intelligence,occupational stress and employee health. Austrian Journal of Psychology.

[12] Grawitch,M.J.,Munz,D.C & Kramer,T.J(2005). Effects of member mood states on creative performance in temporary work groups. Group dynamics: Theory,research,and practice.