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RISK SEEKING AND ACHIEVEMENT MOTIVATION¹

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This study was carried out within the framework of decision making under risk. The main goal was to try to explain individual differences in risk behaviour taking into account a variable not explored in previous literature: achievement motivation. We discovered that when subjects have to choose between numerical stimuli representing money the task's degree of personal implication and the subjects' preferences are different than in situations in which they have to choose between verbal stimuli representing concrete gifts (with similar values to the numerical ones). These changes in subjects' preferences are explained, not only by an initial disposition to seek or avoid risk, but also by different levels in achievement motivation.

Key words: Achievement motivation, decision making under risk, risk seeking, risk aversion.

Atracción por el riesgo y motivación de logro. Este estudio ha sido llevado a cabo dentro del marco de las teorías sobre la toma de decisiones con riesgo. El objetivo principal ha sido tratar de explicar las diferencias individuales en la conducta de riesgo tomando en cuenta una variable que no ha sido explorada en la literatura previa: la motivación de logro. Se ha encontrado que cuando los sujetos tienen que elegir entre estímulos numéricos que representan dinero su grado de implicación personal en la tarea y sus preferencias son diferentes a cuando tienen que elegir entre estímulos verbales que representan regalos concretos (con valores similares a los de los estímulos numéricos). Los cambios observados en las preferencias de los sujetos son explicados, no sólo por una disposición inicial a asumir o rechazar riesgo sino, también, por los diferentes niveles de motivación de logro.

Palabras clave: Motivación de logro, toma de decisiones con riesgo, atracción y aversión al riesgo.

Within the different subfields which have been studied, risk behavior has always been understood as an act of decision-making whose consequences depend on a series of circumstances, of which the decision-maker knows their probability of appearance.

There exists a tradition in psychology in which this type of behavior has been studied with an attempt to establish the mechanisms and general laws according to which human

subjects behave. Most of the time, these mechanisms have been understood in a way similar to those used in psychophysics (Kahneman and Tversky, 1979). Recently, however, Lopes (1987) has proposed an explicative theory of risk behavior more centered on individual differences. Her explicative mechanisms are closer to those of the psychology of personality.

This author proposes an explicative model of risk behavior (R, from now on) postulating two factors. The first of these, of a dispositional nature, represents a basic attitude towards risk (SP, from now on). This disposition is delimited by two opposite

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poles: Security versus Potentiality. When a subject attempts to avoid the possible negative consequences of his/her decision, s/he is placed at the security-seeking pole. When, on the other hand, a subject values more highly the possible positive consequences, s/he is placed at the potentiality pole. Accordingly, subjects who are security-seeking express aversion to risk, while those who seek potentiality express attraction towards risk (risk seeking).

The second factor mentioned is of a situational nature and is called Aspiration Level (A, from now on). This factor, which is not necessarily independent of the previous one, attempts to express the influence of concrete circumstances in which subjects make their decisions.

The influence of both factors on decision-making with risk has been contrasted experimentally contrasted in several studies. Hence, Lopes (1987), León and Lopes (1988) and León and Gambara (1991) find that the SP factor explains differences in their choices of distinct pairs of lotteries. On the other hand, Lopes and Schneider (1987), León and Dueñas (1989) and León and Gambara (1992) report significant effects that different types of manipulations of the A factor produce on risk behavior in the same type of task previously mentioned.

Although such experiments imply an empirical support for the model, there are some questions which have not been cleared up yet. From our point of view, the most important question is related to the existence of individual differences.

Lopes' (1987) model only postulates a dispositional variable for the explanation of risk behavior. However, León and Gambara (1992) found that intra-subject variability, after the elimination of the dispositional factor, was still statistically significant. This fact implies that there could be other variables of a dispositional nature which could explain differences in risk behavior. Then the question could be formulated as follows:

what other dispositional variables could explain intra-subject variability in risk behavior?

To answer this question, we can take into account the line of discussion followed by Lopes (1987) in the formulation of her model. She took into consideration the *manner* in which classical studies, carried out within the framework of the achievement motivation (McClelland, Atkinson, Clark and Lowell, 1953), approached the problem rather than looking for an explanation of risk behavior from a motivational point of view. However, we think that a careful look into the *content* of those studies should be useful for our argument. Let us present a brief summary of those studies.

This group of authors (McClelland *et al.*, 1953) based their studies on the classification of human motivation developed by Murray (1938) which includes this type of motivation. After carrying out several experimental studies in which various motivational variables were treated (Atkinson and McClelland, 1948; Clark, Roby and Atkinson, 1949), they formulated the theory that achievement motivation was the final product of two opposite tendencies: one, approximation to success, which evokes pride, and the other, avoidance of failure, which would evoke shame (McClelland, *et al.*, 1953). Years later, Atkinson (1964) established a model which attempted to explain achievement behavior as a result of the product of three elements: a dispositional factor of achievement motivation and two elements which were dependent on each individual situation, one being the probability of success perceived by the subject, and the other being the degree of incentive which would suppose the achievement of success in a given task. The dispositional factor, at the same time, was formulated as a result of the two opposite tendencies already mentioned in the original theory: motivation to succeed and motivation to avoid failure.

Expressed in mathematical terms, the mo-

del explains the resultant tendency (T_r) in the following manner:

$$T_r = (M_s - M_{af}) (P_s \times I_s) \quad [1]$$

where M_s is the motivation to succeed, M_{af} is the motivation to avoid failure, P_s is the probability of success and I_s is the incentive that the task offers to the subject.

Atkinson (1964) sustains that when the subject performs intrinsically motivated—that is, without external reinforcement—the probability of success and the incentive are complementary:

$$P_s = 1 - I_s \quad [2]$$

This fact implies that motivation ($M_s - M_{af}$) maximizes its effect on achievement behavior in those tasks in which the probability of success perceived by the subject has values close to 0.5, since the product expressed in the situational element of the formula would take on maximum values. Given the fact that the motivational component of the model is the result of two dispositional variables—that is, it is conceived as a stable attribute of the subject's personality—the previously mentioned implication can be formulated as follows: people with a high level of achievement motivation—those whose motivation to succeed is greater than their motivation to avoid failure—choose tasks of intermediate difficulty, when given the opportunity.

This implication of the model attempted to pick up on some of the results already obtained by Atkinson (1957, 1958) and McClelland (1958) and has been repeatedly contrasted (Atkinson and Feather, 1966; Atkinson, 1983; see McClelland, 1985 for a revision).

Going back to the risk seeking theory, it is important to point out the fact that Lopes (1987) explicitly avoids supporting her model on the content of achievement motivation tradition:

«although the basic theoretical constructs of the new theory are quite similar to

those found in the achievement literature, I will make no particular attempt to bring the two approaches into tighter alignment since that could (and probably would) do disservice to the fact that the task domains have important differences, particularly those involving the skill/chance dimension». (p. 264).

However, we tend to agree more with Kogan and Wallach (1967). These authors affirm that certain individuals maintain their attraction towards risk both in tasks involving ability and those based on chance. Accordingly, we think that, although it belongs to the tradition of the study of achievement motivation, preferences of task difficulty could be understood in terms of risk behavior (R), and then achievement motivation could be postulated as another dispositional factor in order to explain individual differences in risk behavior.

Our objective involves introducing achievement motivation as a second dispositional factor to explain individual differences in risk behavior. This objective will be carried out through the paradigm of Lopes's two factor (SP/A) model and following previous work by León and Gambara (1992).

METHOD

Subjects: Fifty-one first year Psychology students.

Stimuli: A set of six lotteries with cash prizes as was used in León and Gambara (*op. cit.*). Another set of six lotteries with prizes in the form of gifts. Both sets were structurally identical.

A questionnaire was applied to assess subjects' levels in achievement motivation (Montero, 1989).

Design and Procedure:

1. The subjects were classified according to their disposition towards risk, using their responses to an initial presentation of lotteries with cash prizes. The lotteries were

RISK LESS (RL) LOTTERY		SHORT SHOT (SS) LOTTERY	
WALKMAN	I	SUN GLASSES	I I I I I I I I
PICTIONARY	I I	VIDEO CASSETTE	I I I I I
RADIO WITH ALARM	I I I	CONCERT TICKET	I I I
AMUSEMENT PARK TICKET	I I I I I	TWO MOVIE TICKETS	I I
MUSIC ALBUM	I I I I I I I I	NOTHING	I
PEAKED (PK) LOTTERY		RECTANGULAR (RC) LOTTERY	
WALKMAN	I	WALKMAN	I I I I
WRISTWATCH	I I I I I	WRISTWATCH	I I I I
VIDEO CASSETTE	I I I I I I I I	VIDEO CASSETTE	I I I I
TWO MOVIE TICKETS	I I I I I	TWO MOVIE TICKETS	I I I I
NOTHING	I	NOTHING	I I I I
BIMODAL (BM) LOTTERY		LONG SHOT (LS) LOTTERY	
WALKMAN	I I I I I I	DOWN JACKET	I
WRISTWATCH	I I I	SKATES	I I
VIDEO CASSETTE	I I	POCKET CAMERA	I I I
TWO MOVIE TICKETS	I I I	T-SHIRT	I I I I I
NOTHING	I I I I I I	NOTHING	I I I I I I I I

Figure 1: Set of 6 lotteries in form of gifts

Figura 1: Conjunto de 6 loterías en el que los premios son regalos

presented in pairs and subjects were asked which they preferred if they had the opportunity to freely choose one of them. The subjects' lottery preferences, which we assume express risk behavior, were measured according to the following formula:

$$R = [(Z_{RC} + Z_{BM} + Z_{LS}) - (Z_{RL} + Z_{SS} + Z_{PK})] / 2 \quad [3]$$

where each «Z» was calculated², v.g.:

$$Z_{RC} = \frac{(\text{Number-of-RC-lottery-choices}) - \mu_{RC}}{\sigma_{RC}} \quad [4]$$

Using formulas (3) and (4), the subjects were classified within the following categories:

RISK-ADVERSE: $R < -0.5$

NORMAL: $-0.5 < R < 0.5$

RISK-SEEKING: $R > 0.5$.

This classification was considered as an operationalization of the SP factor.

2. Afterwards, the subjects were classified according to their scores in the achievement motivation questionnaire.

LOW A.M.: $(M_s - M_{af}) < \text{median}$

HIGH A.M.: $(M_s - M_{af}) > \text{median}$

3. One month later, the subjects were tested on two aspiration level conditions, operationalized according to the following:

1) lotteries with cash prizes

2) lotteries with prizes in the form of gifts.

We had previously used a survey of the same subjects to be certain that the monetary value assigned to the gifts by the subjects was equal to that of the cash prizes.

The preference expressed in the presentation of the pairs of lotteries in both conditions was measured with formula (3) and constitutes the measurement of the dependent variable (R).

Therefore, our design was $3 \times 2 \times 2$, where the first variable, SP factor, was inter-subject and had three levels (risk adverse, normal and risk seeking); the second one, achievement motivation, was inter-subject and had two levels (high and low) and the third one,

Table 1
Summary of Anova

Variable	F value	Probability
SP factor	$F_{2,45} = 39.78$	0.00004
A factor	$F_{1,45} = 2.67$	0.1095
Motivation	$F_{1,45} = 0.01$	
SP \times A	$F_{2,45} = 4.57$	0.0156
SP \times Motivation.	$F_{2,45} = 2.35$	0.1065
A \times Motivation.	$F_{1,45} = 0.17$	
SP \times A \times Mot.	$F_{2,45} = 3.65$	0.0341

A factor, was intra-subject and also had two levels (cash and gifts).

Results:

Results of the performed ANOVA are presented in Table 1.

As the table above shows, results can be summarized as follows:

1.—Concerning the principal effects, only SP factor had a significant effect ($F_{2,45} = 39.78$; $p < 0.0001$).

2.—Among the double interactions, only the SP \times A was statistically significant ($F_{2,45} = 4.57$; $p < 0.05$).

3.—Finally, the triple interaction, SP \times A \times Mot, had a significant effect on risk behavior ($F_{2,45} = 3.65$; $p < 0.05$) and constitutes a very important result connected with our main hypothesis.

DISCUSSION AND CONCLUSIONS

In the first place, our attention was called to the absence of a significant effect of the aspiration level as manipulated in this study, and the absence of influence of the motivational variable.

Although we did not include the A factor effect in our hypothesis, we consider that it is important to discuss this result given the fact that all other studies showed that the A

factor produced a significant effect. Concerning the Aspiration level factor, what could have occurred is: firstable, that the proposed manipulation simply was not adequate; secondly, that the procedure used to change the cash prizes into various types of gifts could have been erroneous; finally, another possible explanation would be that, although the averages in both situations were not different, there could have been changes in risk behavior on the part of the subjects which—in terms of indexes of the central tendency—would have cancelled each other out; in other words, the effect of the manipulation of Aspiration level factor was not additive.

This third explanation can be easily confirmed by looking at the effects of the interaction of the SP and A factors, which turned out to be significant.

As can be appreciated in Figure 2, subjects' risk behavior changed with the change from cash prizes to gifts. There is a moderation effect such that risk-averse subjects approach the mean, assuming more risk when the situation changes from cash to gifts. On the other hand, risk-seeking subjects came closer to mean by taking fewer risks when the situation changed. We can say then that both groups became less extreme in their preferences when prizes changed.

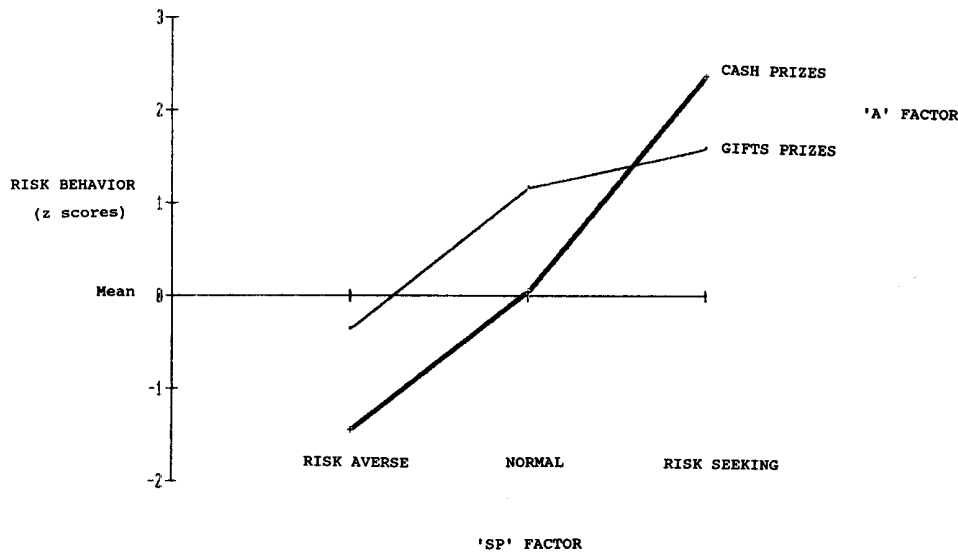


Figure 2: SP and A factors interaction

Figura 2: Interacción entre los factores personal (SP) y situacional (A)

Concerning the role of achievement motivation in the explanation of risk behavior, we can say, looking at the principal effect, that its influence can not be detected in isolation. We will discuss its effect through the triple interaction. In order to do so, the nature of this interaction will be examined more closely.

As can be seen in Figure 3, achievement motivation plays a role in the interaction between the SP and A factors. What appears to occur is that the moderation effect, which we spoke of previously when discussing this interaction, is produced differentially, depending on the achievement motivation of the subjects.

Given the fact of the absence of specific theoretical predictions for differences among the groups, we developed an attempt to discuss this result globally, supporting our comments on the graphic representation shown in Figure 3.

Let us to compare high motivation subjects with low motivation subjects to illustrate this fact more clearly:

a) When a subject scored high in achievement motivation and risk adverse in SP factor, then s/he shows no changes between situations (top-a section of the figure). On the other hand, when a subject was low in achievement motivation and risk adverse in SP factor then s/he shows a big change in risk behavior between situations (bottom-a section). This fact implies that the moderation effect observed in risk behavior for risk-adverse subjects occurs only among those that are, at the same time, low in achievement motivation.

b) When a subject scored high in achievement motivation and normal in SP factor, then s/he shows a big change between situations (top-b section). Whereas, when a subject scored low in achievement motivation and normal in SP factor no changes at all are present (bottom-b section).

c) Subjects both high and low in achievement motivation and risk seeking in SP factor have the same pattern of change between situations (top and bottom-c sections).

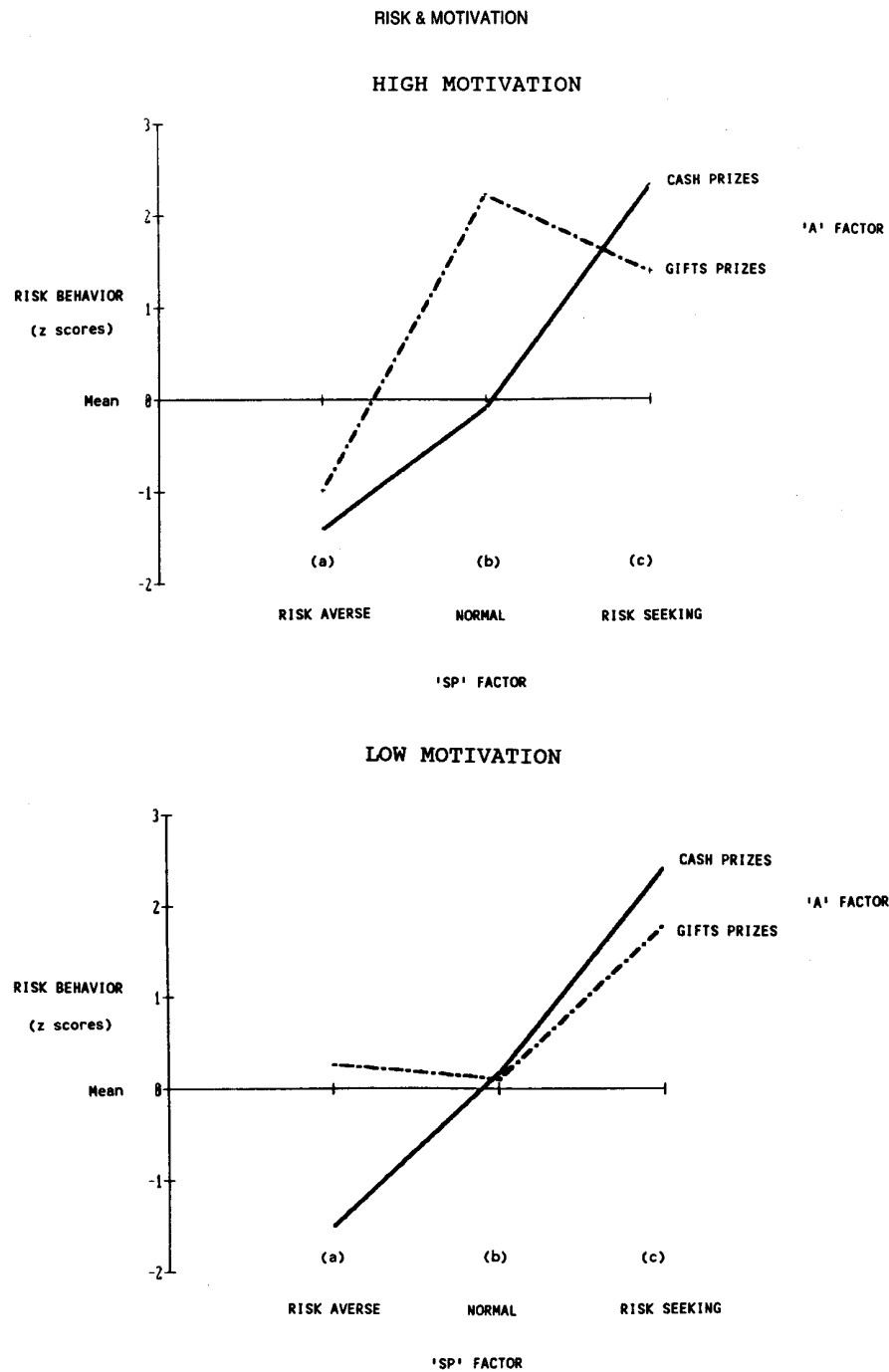


Figure 3: Triple interaction among achievement motivation, SP and A
 Figura 3: Interacción triple entre motivación de logro, SP y A

Until now, it was a general pattern in which risk seeking subjects respond clearly to changes in the A factor whereas risk adverse subjects respond poorly (Lopes & Schneider, 1987). Our results are consistent with such a pattern and show that achievement motivation can explain differences among subjects. Not all the risk adverse subjects respond in the same way. Those who are less motivated are sensitive to changes but the average among the others hide, in previous works, their modifications. Accordingly, the consideration of a new central category (normal), around the mean of the SP factor, also reveals that important differences among subjects can be explained by the influence of achievement motivation.

Finally, in the original formulation of her model, Lopes (1987) made some methodological connections to the achievement motivation tradition but rejected any theoretical similarity to that tradition. However, given the fact of the persistence of some residual and significant individual differences not explained by the SP factor, we have proposed the inclusion of achievement motivation as another dispositional factor. This addition

to the model would let us increase its explicative potencial. The results of this experiment supports this hypothesis, showing that subjects with different levels in achievement motivation behave in different ways within the same group of the SP factor.

We therefore believe that this study presents data which open up a line of research which, until now, has hardly been pursued. It appears that achievement motivation could be one of those variables not taken into account, while its recognition could help the understanding of some unexplained individual differences in studies on decision-making under risk.

NOTES

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(2) The parameters μ and σ were obtained from a population of 459 undergraduate students who became the sample used in this study.

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