

**LOCUS OF CONTROL AND ACHIEVEMENT  
MOTIVATION IN AGING: ASSESSMENT  
AND PRELIMINARY RESULTS ON  
TWO INSTRUMENTS<sup>1</sup>**

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**INTRODUCTION**

There is little data on both constructs in the aged. LUMPKIN (1985) reported the relationships between locus of control and health; ABEL and HAYSLIP (1987) have researched into the relationships between locus of control and retirement; CICIRELLI (1987) showed the role of the locus of control in the demands of the aged on the health services and also on going into hospital. Since the achievement motivation is a construct directed towards the study of behavioral efficiency in social- and work-competitive situations, its study in aging populations has been forgotten. However, we believe that its study has a special interest because motivational factors committed to achievement and performance play an important role in the success of preparation programs for retirement and also in the differential psychology of the aged. The relationships between both concepts would represent, on a theoretical level of analysis, the conjunction of two traditions of psychological thought which have been very important in personality psychology, and on a more pragmatical level, one might think about different suggestions: (a) The aged represent a sample of survivors of risk factors of cardiovascular accidents (risk factors connected with achievement motivation and

also with locus of control factors) because of which the study of the resulting personal structure can suggest new channels of access; (b) The achievement motivation can be seen as a cluster of factors which still play an important role after retirement, and because of that might be used as key elements to carry out programs for adaptation/modification faced with the new situation; (c) Both series of factors can be seen as foci or patterns of differential variables in infancy, adolescence and adults; (d) If we had adequate instruments, the knowledge of both these worlds would allow us to use the created instrumentation as diagnostic criteria, and so we can strengthen a differential psychology of the personality in the aged and (e) The adaptation of adequate instruments for the aged by means of constructs for which we have relevant information proceeding from previous developmental stages permit us to contrast the evolution not only of the isolated dimensions but also the structure of these dimensions through long life-spans. With all of these we can produce a true differential-evolutive psychology of personality, as necessary for differential psychology, as for personality psychology.

As part of a more ambitious research project we intend here to answer the following questions: **Firstly**, whether the locus of control in the aged is mono- or multifactorial; **Secondly**, whether the factors committed to performance in the aged for family and work areas have a mono- or multifactorial solution; **Thirdly**, whether there are relationships between both series of constructs in the aged, operationalized through the isolated empirical factors, and finally **fourthly**, whether it is possible to isolate significant factors with questionnaires and whether these factors have psychometric value for this population.

## METHOD

The sample is made up of 102 subjects (33 men and 69 women), with a chronological age mean of 70.81 years ( $SD = 10.13$ ). All had some type of contact with social welfare and/or health centers for the aged; 70 per cent of them took some drugs for illness or pains; there weren't any cases of severe psychopathology or neurological illness. More than half of them are illiterate and only one possessed further education qualifications. Almost all came from rural areas; however all of them lived in urban areas.

We have developed two instruments which were accomplished by the sample: (i) LUCAN questionnaire of locus of control for the aged developed from LUCAM questionnaire of locus of control for adults (PELECHANO and BAGUENA, 1983). The LUCAN has 72 items referring to the personal relationships in family and work areas. There are four response possibilities: never, sometimes, frequently, always. We know from previous factor analysis that the LUCAM questionnaire for adults is composed of 8 factors, three of them with

an external locus of control expectation; and (ii) the MAEAN questionnaire of achievement motivation for the aged. This one was developed from the MAE questionnaire (PELECHANO, 1975) for adults. It is formed by 72 items. Empirically, the MAE questionnaire for adults isolated six factors: four motivational (3 facilitating and 1 inhibiting factors for the performance) and two anxiety factors (one of them characterised by a behavioral inhibition faced with stress situations; another characterised by a behavioral activation in such situations). The response possibilities in this case are yes or no. Both questionnaires were filled in individually three times (the second two month after the first, and the last one 6 months after the first questionnaire).

We show data of 102 subjects for the first fulfillment; for the second the number fell to 41 and for the third there were only 19. This sample mortality was a result of the large drop-out of men, and of the impossibility of a previous appointment with the subjects.

The answers were codified as follows: for the LUCAN questionnaire, never = 0, sometimes = 1, frequently = 1 and always = 3. For the MEAN questionnaire, no = 0 and yes = 1. Each questionnaire was individually factorised in first and second order (first oblique rotation and second, varimax solution). The following criteria were used for the item selection in the first order matrix: (i) loading greater than 0.30 in a significant factor of the rotated matrix; (ii) if the item possessed a high loading in two factors we accepted the item only in the case of different signs in both and (iii) the number of factors in rotated matrix was limited to a maximum of seven in each questionnaire according to theoretical and empirical expectations. For the second order analysis the limit of factor loading was 0.40 and the number of expected factors was also limited to four for theoretical reasons.

We show the main factorial results for each questionnaire, the relations between the factors, and different reliability coefficients. After that, the relationships between the two series of factors and the final second order factor solution (the two questionnaires at the same time) were presented.

## RESULTS

### The LUCAN questionnaire (2)

The first factor was named **todayism and distrust towards people** (external orientation), because it is characterised by not paying attention to the future and a certain suspicion towards the human being (i.e. the items: "The main law for my life is: live in present because there is no tomorrow", "I believe that the failure of many people is produced by others meddle in everything in our society").

The second factor has shown 15 negative loadings. The content of the items suggests that the person with a high score in this factor makes a previous and precise analysis of the problems before decision-making and maintains the behavior until the goal is achieved. We have named this factor **responsibility in decision-making and persistency in goal-attainment** (internal direction).

The third factor is sampled by 10 items and seems to be a bipolar factor internal-external, as is shown clearly in the item: "If something is going wrong for a friend of mine I know how to analyse the problem and find the solution; but if I myself have problems, I hardly ever see the solution clearly". It also takes the idea of exoneration ("With regard to myself, the failures in punctuality, are not my responsibility", with a factor loading of 0.53), and at the same time, willingness ("If sometime I have won in sport, I believe that is because I have put all my strength in achieving it"). We denominate the factor **self-exoneration in failures and effort in success** (bipolar external-internal direction).

The fourth factor is defined by six items and seems clearly to be of **external control in personal relationships**. An item example is the following: "When I am with a group of friends and we want to go somewhere, I do not give my opinion because the decision always depends on the opinions of the others" or, "If sometimes I have lost a friend, I believe this has occurred through the circumstances, which have been contrary to this friendship".

The fifth factor is represented by 15 items, all of them with negative loadings and with four items which have also been present in the first factor, although with a different sign. The items refer to success or failure in emotional problems (i.e. "When I look at the past, I have the impression that my emotional problems haven't been through my own making, but they have been given to me", with a loading of -0.50) and in work matters (i.e. "Usually, the important thing to obtain a job isn't the validity of the people, but whom one knows", with a loading of -0.47). Tentatively we name this factor as **self-responsibility in personal and social matters**, with an alpha coefficient of 0.75.

The factor solution which has been selected by us, permit us to expect significant correlations between the isolated dimensions and, consequently, the possibility for a second order. The correlation matrix between the first order factors, and the second order factor analysis (varimax rotation) are shown in tables 1A and 1B.

The correlation matrix between factors gives results which in great part are expected: the "internal" factors show positive correlations themselves; the "external" factors also show positive intercorrelations and the coefficients between internal and external factors are negatives. Also, the magnitude of the correlations suggests that there is more than one subjacent pattern of variation. The second order factor solution is shown in table 1B: loadings higher than 0.40, eigen value, communality and the per cent of explained variance of this factor solution (85,5%).

We found three factors. The last two, are a repetition of the first order solution (external control in interpersonal relationships and the bipolar factor on self-exoneration-acknowledgment of effort in personal relationships); the first factor, which explains half of the observed variance, might be named **personal responsibility and trust in people**.

Diverse reliability coefficients can be found in table number 2. The internal consistency **alpha** might be interpreted as a weak indicator of cross-situational consistency (in verbal behavior); the test-retest one, as temporal stability. The analysis of these results can permit us to deduce the following:

(i) Whether we interpret reliability coefficients as proof characteristics, the results can't be explained satisfactorily, because they show a moderate range for each factor and because the observed variation affects the factors differentially: it is difficult to explain from the psychometric theory that the temporal stability of the factor of **todayism and distrust** has a range of between 0.59 and 0.74 at the same time that the factor named **self-exoneration in failures** is in the range of -0.05 and 0.76. However, with a different magnitude, this tendency is observed also with the **alpha** index which corresponds to the same factors. Possibly, an exclusively psychometric explanation of these results raises more questions than gives answers.

**TABLE 1A.- CORRELATION MATRIX OF THE LUCAN QUESTIONNAIRE**  
(N = 102)

First order factors	2	3	4	5
1. Todayism and mistrust towards people (external direction)	-.63***	.37***	.31***	-.72***
2. Responsibility in decision-making and persistency in goal attainment (internal orientation)		-.16*	-.38***	.43***
3. Self-exoneration in failures and effort in success (bipolar external-internal)			.17*	-.31***
4. External control in personal relationships (external direction)				-.22**
5. Self-responsibility (internal direction)				

Note: It has been omitted the zero in the correlations.

(\*) p < .05; (\*\*) p < .01; (\*\*\*) p < .001

**TABLE 1B.- SECOND ORDER FACTOR MATRIX OF THE LUCAN QUESTIONNAIRE (N = 102)**

FACTOR	F-I	F-II	F-III	h <sup>2</sup>
1. Todayism and mistrust	-0.88			.86
2. Responsibility in decision-making and persistency in goal-attainment	.73	-.44		.74
3. Self-exoneration in failures and effort in success			.96	.96
4. External control in personal relationships		.95		.94
5. Self-responsibility	.85			.78
Eigen value	2.02	1.09	.92	
% rotated variance	50.1	27.0	22.9	

Note.- In the factor matrix one has been written only the loadings > .40

(ii) It is possible to suggest the existence of a differential dynamic of the reliability coefficients (consistency and test-retest) as a function of the nature of the factors and/or the development of each isolated factor. If this were true, we could hypothetise that when the time interval rises, the reliability coefficients for the "internal" factors tend to decrease; and a similar tendency can be observed in the mixed bipolar factor (self-exoneration). Each one of the external factors follows a different way: progressively increasing for the external control in personal relationships and decreasing for the todayism and mistrust. In any case, we might suggest that in all except one factor (todayism) the stability and the internal consistency coefficients tend to decrease in accordance with the increase of the time interval.

(iii) The third possible explanation is related to the admission of individual differences in stability and consistency. At the beginning of the study we had a representative sample of the aged population and at the end only one fifth remained. Precisely, this last sample was the most collaborative. In other experiments (Pelechano and Botella, 1981a,b; Pelechano and Darias, 1989) we have demonstrated that the degree of collaboration in psychological experiments is a source of individual differences -intelligence and motivational variables play

a important role in such differences-. The results shown in table 2 are representative, perhaps only of the most collaborative aged in psychological studies.

We believe that the three lines of thought might be taken into account; in another analysis in which we have differentiated between one group with the highest collaboration and another with a lesser degree of collaboration, we have found that the collaborative degree hypothesis alone is not able to explain all the human data.

### he MAEAN questionnaire<sup>(2)</sup>

The same analysis were performed for the MAEAN questionnaire.

The first factor (oblique rotation) is formed by 18 items with an alpha of 0.86. The items content suggests that it is an **inhibition factor either faced with or in stress situations** accompanied by a tendency to only accomplish the tasks demanded, but not others. The following items are paradigmatic: "Many times I abandon my plans because I have not enough self-confidence to put them into practice" (with a loading of 0.63) or "After a test or confronted with a problematic decision on an important issue, I am under stress until I get to know the results" (loading of 0.63).

The second factor is sampled by 14 items and has an alpha of 0.62. The item contents refers to **activation of behavior when faced with stress situations** (i.e. "Slight sentiments of anxiety accelerate my thinking" with a loading of 0.72; or "A tension sentiment before a test or difficult situation help me to attain a better preparation", with a loading of 0.67).

The third factor is represented by 8 items (alpha of 0.66). The items content refer to a **positive motivation to work**, with the search for or acceptance of difficult tasks, task persistency and refusal of a life without work.

The fourth factor is defined by 8 items and seems to be **ambition and personal progress with a special acknowledgement of money rewards for the achievement of a better performance**, personal progress and ambition defences for work. The internal consistency is 0.65.

The fifth factor is defined by 4 elements and has an alpha of 0.20. It seems to be a factor which joins **work and entertainment** and relates them positively (more of one, brings with it also, more of the other).

The sixth factor is sampled by 10 items and has an alpha of 0.67. The main ideas of the items are poor performance and self-inefficiency in comparison with the other people. We identified this factor as a **sentiment of inefficiency and work anonimity**.

Also after that, we realize a second order factor analysis (varimax rotation). The correlation between the first order factors and the second order factor matrix are shown in tables 3A and 3B.

**TABLE 2.- RELIABILITY COEFFICIENTS THREE TIMES FOR THE LUCAN FACTORS**

	Num.	alpha			test-retest		
		A	B	C	A-B	B-C	A-C
		N = 102	N = 41	N = 19	N = 41	N = 19	N = 19
					(2m)	(4m)	(6m)
1. Todayism and mistrust	20	.83	.77	.39	.74***	.61**	.59**
2. Responsibility in decision-making	15	.79	.67	.69	.50***	.29	-.21
3. Self-exoneration in failures	10	.66	.57	.11	.76***	-.16	-.05
4. External control in personal relationships	6	.52	.56	.09	.35*	.47*	.69***
5. Self-responsibility	10	.75	.45	.37	.64***	.19	.25

Note.- Num = number of items in the factor; A, B, C = times of the assessment (first, second, third); A-B = test-retest with an interval of 2 months; B-C = test-retest with an interval of 4 months; A-C = test-retest with an interval of 6 months; m = months. (\*)  $p < .05$ ; (\*\*)  $p < .01$ ; (\*\*\*)  $p < .001$

The factor matrix shows that two factors of the second order are also first order factors (ambition and inefficiency in work situations). The first factor in the matrix is the strongest and seems to be a **reaction factor in stress situations**, primarily negative or with negative consequences and/or results (withdrawal, refusal of motivation to work) even with "contradictory" reactions (withdrawal and activation behavior in stress situations) and with the imagining of and memory of better results in former situations.

In table number 4 we find the consistency and test-retest coefficients for the factors.



**TABLE 3A.- CORRELATION MATRIX OF THE MAEAN QUESTIONNAIRE (N = 99)**

First order factors	2	3	4	5	6
1. Withdrawal reaction in stress situations	.25**	-.34***	.32***	-.01	-.14
2. Activatory reaction in stress situations		-.15	.08	-.01	.13
3. Positive motivation to work			-.33***	.07	-.06
4. Ambition and personal progress				.03	.14
5. Work and entertainment					-.02
6. Inefficiency and work anonimity					

Note.- It has been omitted the zero in the correlations.

(\*\*)  $p < .01$ ; (\*\*\*)  $p < .001$

**TABLE 3B.- SECOND ORDER FACTOR MATRIX OF THE MAEAN QUESTIONNAIRE (N = 99)**

	F-I	F-II	F-III	$h^2$
1. Withdrawal reaction in stress situations	.77			.70
2. Activatory reaction in stress situations	.45			.29
3. Positive motivation to work	-.72			.53
4. Ambition and personal progress	.67			.52
5. Work and entertainment			.98	.78
6. Inefficiency and work anonimity		.94		.89
Eigen value	1.94	0.88	0.97	
% rotated variance	51.7	23.2	25.1	

Note.- In the factor matrix one has been written only the loadings  $> .40$

**TABLE 4.- RELIABILITY COEFFICIENTS THREE TIMES FOR THE MAEAN FACTORS**

	Num.	alpha			test-retest		
		A	B	C	A-B	B-C	A-C
		N=99	N=41	N=19	N=41	N=19	N=19
					(2m)	(4m)	(6m)
1. Withdrawal reaction in stress situations	18	.86	.77	.43	.85***	.68**	.72***
2. Activatory reaction in stress situations	14	.81	.78	.77	.64***	.08	.39
3. Positive motivation to work	8	.66	.01	.22	.85***	.19	.48*
4. Ambition and personal progress	8	.65	.50	.43	.80***	.28	.56**
5. Work and entertainment	4	.20	.37	.64	.78***	.30	.59**
6. Inefficiency and work anonimity	10	.67	.59	.41	.66***	.35	.26

Note.- Num = number of items in the factor; A, B, C = times of the assessment (first, second, third); A-B = test-retest with an interval of 2 months; B-C = test-retest with an interval of 4 months; A-C = test-retest with an interval of 6 months; (m) = months; (\*)  $p < .05$ ; (\*\*)  $p < .01$ ; (\*\*\*)  $p < .001$

The results tend to be in a similar direction to those presented for the locus of control factors. Probably in this case one can show more clearly the independency between the alpha coefficients and the number of items in each factor (i.e. compare the first factor with the fifth factor and remember that the former has 18 elements and the latter only 4). Also one observes dissimilar correlational tendencies between (i) stability and internal consistency coefficients; (ii) positive and negative motivational factors; and (iii) furthermore one observes frequent relations in U-form between stability coefficients and time intervals (4/10 of such relations are non-linear). Also, as in the locus of control factors, the right and complete explanation of these results must await other studies.

## LOCUS OF CONTROL AND ACHIEVEMENT MOTIVATION IN THE EDERLY

At the beginning of this work we spoke on the possible relationship between factors of locus of control and the factors of motivation. In table number 5 one shows the correlation coefficients between the first order factor of both questionnaires and the corresponding factorial matrix (varimax from principal components) for both questionnaires together.

The correlations (table 5A) suggest that one could isolate some factors defined by motivational and locus of control variables although one would not expect high relations between both series of factors. This one is found in the factorial matrix (table 5B). In this factorial solution we have four factors. In the **first** there are significative loadings for all factors of the locus of control and the sign of them suggests that it is an **external locus of control and distrust**. The **second** factor is defined essentially by the achievement motivational variables and can be named as **inhibition faced with stress situations and failure of positive motivation towards work** and within it here appears a factor loading of locus (irresponsibility in decision-making). The third one is a disturbing factor of performance and of personal relationships; we can define this as **stress inhibition and working inefficiency with an external locus of control in personal relationships**. The **fourth** factor is verbally, a conjunction of work and entertainment, also with an exoneration in failures. Usually, it seems to be the person who find excuses for this failures and demands more entertainment if he must work more (the behavioral translation results in more and more entertainment) and in this sense, seems to be a **disturbing motivational factor with exoneration for failures** (personal and professional).

**TABLE 5A.- CORRELATION MATRIX OF LUCAN AND MAEAN QUESTIONNAIRES (N = 99)**

LUCAN FACTORS	MAEAN FACTORS					
	MA-1	MA-2	MA-3	MA-4	MA-5	MA-6
1. Todayism and mistrust	.35**	.18*	-.28**	.24*	-.09	.23*
2. Responsibility in decision-making	-.47***	-.27**	.40***	-.24**	.12	-.18*
3. Self-exoneration in failures	.08	-.14	-.06	.00	.19**	-.10
4. External control in personal relationships	.42***	.19*	-.08	.18*	-.02	-.05
5. Self-responsibility	-.24*	-.11	.09	-.15	-.08	-.21*

NOTE: It has been omitted the zero in the correlations.

MA-1 = Withdrawal reaction in stress situations; MA-2 = Activatory reaction in stress situations; MA-3 = Positive motivation to work; MA-4 = Ambition and personal progress; MA-5 = Work and entertainment; MA-6 = Inefficiency and work anonimity; (\*)  $p < .05$ ; (\*\*)  $p < .05$ ; (\*\*\*)  $p < .001$ .

**TABLE 5B.- FACTORIAL MATRIX OF LUCAN AND MAEAN QUESTIONNAIRES (N = 99)**

	F-I	F-II	F-III	F-IV	h <sup>2</sup>
Todayism and mistrust	.89				.84
Responsibility in decision-making	-.62	-.44			.69
Self-exoneration in failures	.57			.50	.69
External control in personal relationships			.56		.53
Self-responsibility	-.86				.75
Withdrawal reaction in stress situations		.58	.53		.70
Activatory reaction in stress situations				-.44	.33
Positive motivation to work		-.70			.50
Ambition and personal progress		.76			.62
Work and entertainment				.79	.66
Inefficiency and work anonimity			-.78		.76
Eigen value	3.27	1.29	1.05	0.99	
% rotated variance	49.5	19.6	15.9	15.0	

NOTE: In the factor matrix one has been written only the loadings  $> .40$

## CONCLUSIONS AND DISCUSSION

These results clearly answer the questions asked at the beginning of this study: it is possible to use questionnaires with the elderly; this type of instruments have psychometric validity; both locus of control and achievement motivation in the aged are multifactorial (we have found five- and six-factor solutions in first order and a three-factor solution in the second order for each construct. Also, some relations exists between both sets of factors but these relations do not permit us to confuse in the aged locus of control and achievement motivation (better, perhaps, achievement motivation as remembered).

Results coming from adult populations with similar instruments (Pelechano and Báguena, 1983) suggest that there are structural changes in the aged when we compare them with the adult factorial solution: locus of control structure became, in the aged, simpler (5 factors in the aged and 8 in the adults to explain a similar magnitude of variance). A similar phenomenon occurs for motivational achievement questionnaire (6 factors in adults and 5 in the aged). Despite these changes, however, there are some invariances: todayism in personal relationships, responsibility in decision-making, exoneration and *fatum* or attribution of external control in the failure of personal relationships remain in both populations. In performance motivation the following factors remain: two stress reactions (inhibitory and activatory), work-entertainment factor, ambition and inefficiency sentiment, but the functional relations between them are different in both cases (adults-aged). The main differences are also located in the relationships between the isolated factors (in the aged these are higher than in the adults and, consequently, not as differentiated as in adults). We conclude provisionally that between adults and the aged there are more differences in the factor structure and in relationships between the isolated factors that in the number and in the name of them.

Another topic of interest refers to stability and consistency, The results previously shown suggest that the three sources of variation (persons, factor class, and type of statistic and/or instrument quality) play an important role. These results could suggest that in questionnaires with aged subjects the isolated dimensions tend to become situationist or, alternatively, that the aged react in a situationist way to the stimuli of locus of control and performance motivation. However other results coming from experiments with the young and with adults demonstrate that the specificity hypothesis (to think that this phenomenon is idiosyncratic for the aged) is very difficult to maintain. Our own theoretical model (Pelechano, 1973; 1989, in press) suggests that we need to realize longer studies to isolate the **dynamics of reliability** in personality psychology. We assume that the human being is psychologically constituted by diverse functional systems, relatively independent among themselves and these systems are defined by

variables and parameters<sup>(3)</sup>, and when experiments of long duration have been made the results always pose problems for the usual theoretical models in personality psychology and demonstrate that one requires more and better theoretical efforts, efforts perhaps inspired in a parametric analysis and which resist and bear the criticism of experimental analysis.

## NOTES

(1) This work has been possible for grant number 25/22.04.85 of the Autonomous Government of Canary Islands (Spain).

(2) The original factorial matrix remain in the Department of Personality, Assessment and Psychological Treatments of the University of La Laguna (Spain).

(3) The parameter model supposes that there are functional systems defined by variables and which are conceptually limited by parameters in relation to their descriptive, explicative and predictive value. One distinguishes three types of parameters: stimuli, subject and response. In subject parameters there are two main axis (consolidation and individual-social); in the consolidation axis one has operationalised three operative levels for personality dimensions (situative factors, intermediate-motivational dimensions and basic dimensions of personality); in the individual-social axis we locate all subject factors between one of the two ends (individual content or social content). In relation to responses there are parameters to organize the different responses and response systems which are present in performance such as cuantitative-qualitative responses, success and different types of error. Stimuli parameters are: level of difficulty of the job, time of performance, type of practice and so forth. In the two bibliographic references cited one can find an extended formulation of the parameter model and also confirmatory experimental results for this model.

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