

Salience of positive and negative affect in the recognition of depression among elderly persons

Tina L. Harralson, PhD; M. Powell Lawton, PhD



Tina L. HARRALSON

Generally, depression is thought of in terms of negative affect. However, in the following paper, the contribution of positive affect (PA), as well as negative affect (NA), is demonstrated in the recognition of clinically significant depression. Affect and depression data were collected from 554 residents of a large, urban geriatric center. Statistical analyses demonstrated that both PA and NA were correlated with depression and measures of frailty, and that low PA and high NA were risk factors for depression 1 year later. Results suggest that low PA, or anhedonia, may be particularly important in diagnosing depression among older persons who may not readily report depressive symptoms such as sadness.

Keywords: depression; euthymia; positive affect; negative affect; elderly

Author affiliations: University of Pennsylvania School of Medicine, Division on Geriatric Psychiatry, Pa, USA (Tina L. Harralson); and Polisher Research Institute, Philadelphia Geriatric Center, Pa, USA

Address for correspondence: Dr Tina L. Harralson, University of Pennsylvania School of Medicine, Division of Geriatric Psychiatry, 3600 Market Street, Room 762, Philadelphia, PA 19104, USA (e-mail: harralso@mail.med.upenn.edu)

Characterizing patients' affect is an important component of the diagnosis of depression and assessing changes over time is important in evaluating treatment outcomes. Therefore, evaluating affect and following the course of affect throughout treatment is a major component of the clinical process. The purpose of this paper is to demonstrate the pertinence of measuring both positive affect (PA) and negative affect (NA) when assessing depression, and not to focus only on depression, anxiety, and other forms of negative affect.

As has been demonstrated by research findings and postulated by various circumplex models of emotion, positive and negative affective states are neither polar opposites ($r=-1.00$) nor totally unrelated ($r=0.00$).¹ In other words, one should not assume that a report of high NA means that the respondent is also experiencing low PA. Measuring both is necessary. Recently, Lawton and colleagues² have reported on the development of a brief Negative Affect Scale that evaluates annoyance, irritation, depression, worry, and feeling sad/blue, and a brief Positive Affect Scale that considers warmth, degree of interest, happiness, contentment, and energy.

Among a sample of 486 persons (mean age: 83.5 years) living in a residential care setting, PA and NA were found to be modestly negatively correlated ($r=-0.26$).² This degree of relationship exemplifies their relative independence while still being negatively correlated. Furthermore, concurrent correlations showed that NA was correlated with Geriatric Depression Scale (GDS, $r=0.61$),³ Profile of Moods States (POMS),⁴ POMS Anger subscale ($r=0.56$), POMS Vigor subscale ($r=-0.30$), total sum of the Cumulative Illness Rating Scale (CIRS, $r=-0.22$);⁵ and activities of daily living ($r=-0.29$).⁶ On the other hand, PA was correlated with GDS ($r=-0.68$), POMS Anger ($r=-0.30$), POMS Vigor ($r=0.74$), CIRS ($r=0.23$), and activities of daily living ($r=0.27$), but in the opposite direction.

Free papers

In the study noted above, older persons were asked specifically to rate the states defining NA and PA. However, in a clinical interview, the patient may not be asked to report affective states so succinctly. Unless asked directly, older persons may be reluctant to report negative affect. Lyness and colleagues⁷ found that persons older than 60 years who had been diagnosed as major depressives underreported their depressive symptoms. Similarly, Gallo et al⁸ warned of a subgroup of older persons who exhibit nondysphoric depression. They found that persons who reported other depressive symptoms, but denied sadness or dysphoria, were at a higher risk for death (relative risk, RR=1.70), impairment in activities of daily living (RR=3.76), impairment in instrumental activities of daily living (RR=5.07), psychological distress (RR=3.68), and cognitive impairment (RR=3.00) 13 years later.

Measuring affective states over time is also important in order to take individual differences in stability and lability of emotion into account, and repeated measurement could be beneficial in determining treatment outcomes. Lawton et al⁹ collected daily affect data for 30 days among a sample of 78 residential care persons (mean age: 82.8 years). Nineteen persons had been diagnosed with major depression, 21 had minor depression, and 37 were nondepressed. Intersubject variability was determined by summing the residents' individual scores over the 30-day period and computing z scores. As expected, mean levels of PA were highest in nondepressed persons and lowest in major depressives. NA was lowest in nondepressed persons and highest in persons with major depression. Intrasubject variability was also examined, and daily variability in PA was low, and at a very low level of positive feeling, among persons diagnosed with major depression, whereas daily variability in NA was least among nondepressed persons. There was a trend toward greater day-to-day variability in PA for persons with minor depression. These results indicate that persons diagnosed with major depression report persistent, invariant low PA, or anhedonia, rather than persistent NA, which is thought to be a marker of major depression. In contrast, nondepressed persons showed moderate variability in their reports of PA, but little change in their lack of NA.

Despite the significance of anhedonia as one of the classic criteria for diagnosing clinical depression, emphasis on dysphoria, anergia, and vegetative symptoms in depression has obscured recognition of the importance of the presence, absence, and dynamics of

Selected abbreviations and acronyms

BMIC	<i>Blessed Memory-Information-Concentration</i>
CIRS	<i>Cumulative Illness Rating Scale</i>
GDS	<i>Geriatric Depression Scale</i>
MSADS	<i>Modified Schedule for Affective Disorders and Schizophrenia</i>
NA	<i>negative affect</i>
PA	<i>positive affect</i>
POMS	<i>Profile of Mood States</i>
PSMS	<i>Physical Self-Maintenance Scale</i>
ROC	<i>Receiver Operating Characteristics</i>

positive feelings. Just as absence of enjoyment and other positive emotions is a hallmark of depression, the temporal flow of positive and negative feelings provides potentially valuable information regarding the ongoing course and prognosis for the disorder. We also suggest that some therapeutic interventions are uniquely capable of increasing the prevalence of positive feelings. For example, in their long program of research on the treatment of depression, Lewisohn and colleagues¹⁰ have demonstrated that people are capable of increasing their frequency of positive experiences, and that such a change in the mix of PA and NA has a measurable therapeutic impact. The present article will review recent work documenting the relevance of PA and NA to clinical depression and its course.

Methods

Affect data were collected from 554 residents (71% female) of a large, urban geriatric center as part of a longitudinal study. Mean age for the sample was 83.3 years (SD = 6.0). Sixty-nine percent of the participants resided in apartments and 31% resided in the nursing home. The Philadelphia Geriatric Center Positive Affect and Negative Affect Scale was used to assess affective states.² This 10-item measure consists of Positive and Negative subscales rated on Likert scales ranging from 1 to 5. Items representing PA and NA were noted above. Other assessments included a Modified Schedule for Affective Disorders and Schizophrenia (MSADS),¹¹ the Geriatric Depression Scale (GDS),³ Fuld's adaptation of the Blessed Memory-Information-Concentration task (BMIC),¹² Physical Self-Maintenance Scale (PSMS),⁶ and Cumulative Illness Rating Scale (CIRS).⁵

- The MSADS is a semistructured clinical assessment used in this case to determine patients' level of depression: major, dysphoric, or nondepressed.
- The GDS is a 30-item, self-report, "yes-no" format measure of depression developed specifically for older persons. The GDS does not contain somatic, vegetative symptoms of depression, which are often symptoms of age rather than depression in this population. Scores may range from no depression (0) to severely depressed (30) and a score of >10 suggests clinically significant depression.
- The BMIC is a 33-item measure of cognitive impairment, which is scored by the number of incorrect responses. It includes questions pertaining to memory and concentration. A score of >10 suggests cognitive impairment.
- The PSMS is a measure of activities of daily living, which assesses the degree of functional disability. It includes 8 items regarding the amount of assistance needed to complete everyday activities such as eating, bathing, and toileting. Items are scored "need no help" (1), "need some help" (2), and "need help or can't do alone" (3). A score of 12 or greater suggests clinically significant functional impairment.
- The CIRS is a summary of illnesses categorized into 13 independent body systems. Each system is rated by the patient's physician on a 5-point scale of severity ranging from none (0) to extremely severe (4).

	Mean (SD)	Range	rPA	rNA
GDS	7.51 (6.4)	(0 - 28)	-0.67*	0.62*
BMIC	7.71 (5.7)	(0 - 31)	-0.02	0.07
PSMS	10.46 (3.1)	(8 - 23)	-0.24*	0.30*
CIRS	1.66 (0.34)	(1 - 2.8)	-0.23*	0.21*
Pain	1.80 (1.1)	(0.83-5.0)	-0.20*	0.25*

Table I. Means of measures of frailty and geriatric depression scale and correlations of measures with positive affect (PA) and negative affect (NA). BMIC = Blessed Memory-Information-Concentration; CIRS = Cumulative Illness Rating Scale; GDS = Geriatric Depression Scale; PSMS = Physical Self-Maintenance Scale. * $P \leq 0.001$.

	Euthymic	Dysphoric	Major depressed	F ratio
PA	10.46 (3.8)	6.12 (3.5)	3.49 (3.4)	130.85
NA	0.68 (1.5)	3.50 (3.9)	6.50 (6.4)	157.00

Table II. Comparison of means of positive affect (PA) and negative affect (NA) among euthymic, dysphoric, and major depressed persons. All $P \leq 0.01$.

Means of these assessments are shown in *Table I*. In general, this sample is nondepressed, cognitively unimpaired, and functionally able despite moderate to moderately severe physical illness.

Results

Sample descriptive data and correlations with markers of frailty are shown in *Table I*. As expected, GDS, CIRS, PSMS, and Pain were negatively correlated with PA and positively correlated with NA (all $P < 0.001$). Cognitive impairment was not correlated with either PA or NA in this sample. In addition, the correlation between PA and NA was $r = -0.43$ for this sample. However, among nondepressed, or euthymic persons, the correlation between PA and NA was $r = -0.17$, which suggests that much of the strength of the negative relationships between the two in the population as a whole can be attributed to their associations with clinical depression. One-way analyses of variance (ANOVAs) were conducted to compare the means of PA and NA among euthymics, dysphorics, and persons with major depression. PA was highest among persons with euthymia and lowest among persons experiencing major depression. NA was highest among persons with major depression and lowest among euthymics (*Table II*). PA was relatively stable from baseline to 1-year follow-up ($r = 0.53$) and 2-year follow-up ($r = 0.51$) among euthymics.

Among persons with any depression, major or dysphoria, the correlation was $r = 0.48$ at the 1-year follow-up and $r = 0.28$ at the 2-year follow-up, indicating that PA was lower at follow-up in depressed persons. In contrast, NA was not stable over time among euthymics, whereas it appeared to be relatively stable in depressed persons. Stability correlations are shown in *Table III*.

Receiver Operating Characteristics (ROC)¹³ curves were calculated for PA and NA to determine their sensitivity and specificity in identifying any depression

	PA (r)		NA (r)	
	1-year	2-year	1-year	2-year
Total sample	0.61	0.55	0.45	0.26
Euthymic	0.53	0.51	0.16	-0.05
Depressed	0.48	0.28	0.41	0.51

Table III. Stability correlations of positive affect (PA) and negative affect (NA) among euthymic and depressed persons from baseline to 1-year and 2-year follow-ups.

Free papers

(determined by GDS scores >10 and/or MSADS diagnosis of any depression) and for identifying MSADS diagnosis of major depression, and were used to calculate cutoff scores for PA and NA (Table IV).

Using these cutoff scores, it was determined that 73% of persons with any depression had some form of affective disturbance (ie, high NA and low PA; high NA and high PA). Among persons with any depression with some form of affective disturbance, 33% reported experiencing both low PA and high NA. Eighty-two percent of persons with major depression reported some affective disorder and 52% reported experiencing low PA and high NA (Table V).

In addition to being a moderately good identifier of depression, both PA and NA contributed to the prediction of depression. Logistic regression analyses indicated that high NA and low PA (anhedonia) are associated with risk of depression after 1 year (model $\chi^2=12.91$,

	ROC cutoff	Sensitivity	Specificity
Any depression			
PA	<6	0.52	0.89
NA	>2	0.53	0.90
Major depression			
PA	<5	0.66	0.84
NA	>3	0.69	0.86

Table IV. Sensitivity and specificity of positive affect (PA) and negative affect (NA) as a screen for depression.

$P=0.002$). Low PA increases the odds of depression by 15% (Exp B=0.87, $P=0.02$) and high NA increases odds of depression by 38% (Exp B=1.38, $P=0.01$). Low PA and NA are also moderate indicators of treatment effect. When PA, NA, and the Hamilton Rating Scale for Depression¹⁴ were used to track changes among persons receiving pharmacological treatment for depression. Changes in Hamilton scores were correlated with both changes in PA ($r=-0.43$, $P=0.002$) and changes in NA ($r=0.40$, $P=0.004$).

Any depression			
Low NA	27%	18%	45%
High NA	22%	33%	55%
	49%	51%	100%
Major depression			
Low NA	18%	14%	32%
High NA	16%	52%	68%
	34%	66%	100%

Table V. Cross-tabulations of positive affect (PA) and negative affect (NA) responses among persons with any depression and major depression.

Discussion

Short measures of PA and NA can easily be utilized in the clinical setting. Subjects can complete them quickly and understand immediately the reasons for wishing to use them repeatedly. The above analyses demonstrate their concurrent validities and their moderately good predictive ability. PA in particular assesses attributes not often included in typical assessment for psychopathology. In particular, our findings indicate that the absence of PA is of equal importance to the presence of NA in identifying patients with clinically significant depression. We suggest that these brief parallel measures might be particularly useful when the course of illness is being followed over time and when increasing the prevalence of positive experiences is one of the explicit treatment goals. In conclusion, PA as well as NA are salient indicators of depression, and may tap into depression in older populations who may underreport depressive symptoms.⁸ PA and NA scales are a simple and conclusive way to measure affective states over time that may provide salient information regarding the ongoing course and prognosis of depression. □

REFERENCES

1. Plutchik R. The circumplex as a general model of the structure of emotions and personality. In: Plutchik R, Conte HR, eds. *Circumplex Models of Personality and Emotions*. Washington, DC: American Psychological Press; 1997:17-45.
2. Lawton MP, Kleban MH, Dean J, Rajagopal D, Parmelee PA. The factorial generality of brief positive and negative affect measures. *J Gerontol*. 1992;47:P228-P237.
3. Yesavage JA, Brink TL, Rose TL. Development and validation of a Geriatric Depression Scale. *J Psychiatr Res*. 1983;17:31-49.
4. McNair DM, Lorr M, Droppelman LF. *Profile of Mood States Manual*. San Diego, Calif: Educational and Industrial Testing Service; 1921.
5. Linn BS, Linn MW, Gurel L. Cumulative Illness Rating Scale. *J Am Geriatr Soc*. 1968;16:622-626.
6. Lawton MP, Brody EM. Assessment of older people: self-maintaining and instrumental activities of daily living. *Gerontologist*. 1969;9:179-188.
7. Lyness JM, Cox C, Curry J, et al. Older age and the underreporting of depressive symptoms. *J Am Geriatr Soc*. 1995;43:216-221.
8. Gallo JJ, Rabins PV, Lyketsos CG, Tien AY, Anthony JC. Depression without sadness: functional outcomes of nondysphoric depression in later life. *J Am Geriatr Soc*. 1997;45:1-9.
9. Lawton MP, Parmelee PA, Katz IR, Nesselroade J. Affective states in normal and depressed older people. *J Gerontol B Psychol Sci Soc Sci*. 1996;51:P309-P316.
10. Lewinsohn PM, Sullivan M, Grossup SJ. Changing reinforcing events: an approach to the treatment of depression. *Psychother Theory Res Pract*. 1980;17:322-334.
11. Spitzer RL, Endicott J. *Schedule for Affective Disorders and Schizophrenia*. New York, NY: New York State Psychiatric Institute; XXXDateXXX
12. Fuld PA. Psychological testing in the differential diagnosis of the dementias. In Katzman R, Terry R, Bick KL, eds. *Alzheimer's Diseases: Senile Dementia and Related Disorders*. New York, NY: Raven Press; 1978:185-193.
13. Centor RM. A Visicalc program for estimating the area under a receiver operating characteristic (ROC) curve. *Med Decis Making*. 1985;5:139-148.
14. Hamilton M. A rating scale for depression. *J Neurol Neurosurg Psychiatry*. 1960;23:56-62.

Puesta en valor de los afectos positivos y negativos en el reconocimiento de la depresión en sujetos de edad avanzada

La depresión se considera generalmente en términos del afecto negativo. El siguiente artículo demuestra la contribución, clínicamente significativa, tanto del afecto positivo (AP) como del afecto negativo (AN) en el reconocimiento de la depresión. Se recogieron los datos de afecto y depresión de 554 residentes de un gran centro geriátrico urbano. Los análisis estadísticos demostraron que los AP y los AN se correlacionaron con la depresión y con mediciones de fragilidad, y que un bajo AP y un alto AN fueron factores de riesgo de depresión al cabo de un año. Los resultados sugieren que un AP bajo, o anhedonia, puede ser particularmente importante para el diagnóstico de depresión en los sujetos de edad avanzada, quienes no refieren fácilmente síntomas depresivos como es la tristeza.

Valeur de l'affect négatif et positif dans la reconnaissance de la dépression du sujet âgé

D'une manière générale, la dépression est perçue en termes d'affect négatif. Cependant, ainsi que nous le montrons, l'affect positif (AP) contribue, au même titre que l'affect négatif (AN), à la reconnaissance de la dépression cliniquement patente. Des données concernant affect et dépression ont été recueillies chez 554 sujets âgés qui résidaient tous dans un grand centre gériatrique, implanté en milieu urbain. Les analyses statistiques ont démontré que AP et AN étaient tous deux corrélés à la dépression et aux paramètres reflétant la vulnérabilité psychique, et que des valeurs basses de AP et hautes de AN étaient prédictives de la survenue d'une dépression à un an. Ces résultats suggèrent qu'un AP faible, ou l'anhédonie, peuvent être d'une grande importance dans le diagnostic de la dépression du sujet âgé, quand font défaut les symptômes caractéristiques comme la tristesse.