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A SOCIAL DESIRABILITY SCALE FOR THE MMPI-2. WHICH OF THE TWO: WIGGINS (WSD) OR EDWARDS (ESD)?

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Abstract

The objective of this research aims to comparatively analyze the diagnostic accuracy of two social desirability detection scales that have been obtained from the 567 items that comprise the Minnesota Multiphasic Personality Inventory-2 (MMPI-2): Wiggins Wsd Scale and Edwards ESD Scale. The 583 participants (232 men and 351 women) were differentiated into two groups according to their way of answering: Honest response group ($N = 310$) who replied truthfully following the guidelines of MMPI-2, and simulated response group ($N = 273$) who were instructed to intentionally and consistently show a positive image of themselves. The results have shown a higher diagnostic accuracy and predictive power, although less reliability (Cronbach's α) for the Wiggins (Wsd) Scale than for Edwards (ESD).

Keywords: MMPI-2, Social Desirability, Edwards (ESD) Scale, Wiggins (Wsd) Scale, Malinger.

Resumen

El objetivo de esta investigación pretende analizar comparativamente la precisión diagnóstica de dos escalas detectoras de Deseabilidad Social que han sido obtenidas de los 567 ítems que componen el Inventario Multifásico de Personalidad de Minnesota-2 (MMPI-2): la escala Wsd de Wiggins y la ESD de Edwards. Los 583 participantes (232 varones y 351 mujeres) fueron diferenciados en dos grupos según su forma de contestar: grupo sincero ($N = 310$), que contestaron de forma sincera siguiendo las directrices de MMPI-2, y simulador ($N = 273$), que fueron instruidos para mostrar intencionada y coherentemente una imagen favorable de sí mismos. Los resultados han demostrado una mayor precisión diagnóstica y poder predictivo, aunque menor fiabilidad (α de Cronbach), en la escala de Wiggins (Wsd) que en la de Edwards (ESD).

Palabras Clave: MMPI-2, Deseabilidad Social, Escala de Edwards (ESD), Escala de Wiggins (Wsd), Simulación.

Introduction

In the work on the psychological assessment of an individual's personal characteristics, both in the forensic (Andrews & Meyer, 2003), organizational (Salgado, 2005), or penitentiary field, is becoming more common to find situations where the assessed person may not be reporting emotional or psychological problems with the sincerity and honesty required by the test, if they know of the possibility of not being discovered and obtaining benefits such as: child custody, evasion of criminal prosecution or reduction of penalty severity, a vacant job, financial compensation, or sick leave injury benefits.

Malingering is defined by the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV, 1995) as "the intentional production of false or grossly exaggerated physical or psychological symptoms, motivated by external incentives such as avoiding work or military duty; obtaining drugs or financial compensation; or evading criminal prosecution. Under some circumstances, malingering may represent adaptive behavior for example, feigning illness while a captive of the enemy during wartime" (p. 698).

Social desirability has been a recurring theme in psychological assessment. To present a *socially desirable image* is an intrinsic feature of an individual's personality, but when normal limits are exceeded psychologists must be careful to detect the examinee's attempt to malingering.

Over the past 50 years research on social desirability and its involvement in various contexts of personality disorders assessment, has been a topic of great concern and interest to practitioners of psychology and behavior analysts. Generally it has been concluded that social desirability affects any methodology that is based on the assessment of personality, and this includes self-questionnaires (Edwards & Edwards, 1992; Jiménez & Sánchez, 2002; Preti et al, 2007, Rogers, 2008), ipsative measures (Cornell & Dunlap, 1994), and forced-choice questionnaires (Christiansen, Burns & Montgomery, 2005).

Different types of research on social desirability have a special impact according to their particular denomination and definition. For Bagby & Marshall, (2004) *self-deception* is characterized as a general willingness to think about themselves in a slightly favorable way. The *impression management* is defined by Barrick & Mount

(1996) as a deliberate attempt to distort their own responses with the intention of making a favorable impression on others" (p. 262). Crowne & Marlowe (1960) consider social desirability as simply to present oneself favorably. Either way there are many variables, both personal and situational, which may determine socially desirable responses in a person.

Given the importance of ensuring data reliability, some researchers have worked with diverse social desirability scales (Edwards, 1962; Elvekrog & Vestre, 1963; Fordyce, 1956; Hanley, 1956; Heilbrun, 1964), simulation condition groups in diverse contexts and with other types of complementary scales (Arce, Fariña, Carballal, & Novo, 2006; Graham, Watts, & Timbrook, 1991; Jiménez & Sánchez, 2003; Rogers 2008; Rogers & Bender, 2003). Other authors have taken interest in sensitivity and specificity analysis using the ROC curve method (Nicholson, Mouton, Bagby, & Buis, 1997; Pelegrina Ruiz-Soler, & Wallace, 2000), with the objective of detecting different manipulations of the provided data.

In the Minnesota Multiphasic Personality Inventory-2 (MMPI, Hathaway & McKinley, 1940, 1983), and in its following restructured version (MMPI-2, Butcher, Graham, Tellegen, Dalhstron, & Kaemmer, 1989), interest has been drawn to the development and inclusion of a set of validity scales that can detect exaggeration or minimization of psychopathology (often referred to as fake-bad and fake-good, respectively), creating a second generation of scales for the detection of distortions in response-patterns in the MMPI-2 (simulation and defensiveness).

The new revision of the MMPI-2 (Butcher, Graham, Tellegen, Dalhstron & Kaemmer, 2001) in its configuration of the validity scales, combines traditional scales (L, F and K) with other new experimental scales, such as: Edwards Social Desirability (Edwards, 1957), the Wiggins Social Desirability (Wiggins, 1959) and the Other Deception scales (Nichols & Greene, 1991).

The first version of the Social Desirability Scale *ESD* of Edwards (1953) was developed with 79 items. In the process of refining the scale, years later, Edwards (1957) conducted a study with 10 judges to select those items in the MMPI that evoke socially desirable responses. He selected items that could differentiate between individuals scoring high or low on the scale, thereby reducing its length to 39 items, 12 of which correspond to the Infrequency Validity Scale (*F*), and 9 to the Welsh Anxiety Scale (*A*) that should be answered as *false* if wished to be considered as *socially desirable*.

Finally, a further restructuration by Greene (2000) reduced the scale to 37 items. This adjustment reflects, in general, "absence of psychopathological problems, good attention and concentration skills, and acceptable social relations" (p. 102), solving in turn the problem of saturation of psychopathological symptoms, which is one of the most frequent critics made on this types of scales when trying to assess social desirability (Crowne & Marlowe, 1960, Ferrando & Chico, 2000).

Wiggins' Social Desirability Scale *Wsd* (1959) was developed in order to discriminate between a group of subjects ($N = 178$) trained to respond to the *MMPI* in a manner as to appear *socially desirable* (or what was considered in American culture as *socially desirable*), from another group ($N = 140$) who was instructed to respond truthfully under the standard instructions of the *MMPI* manual. Baer, Wetter, Nichols, Greene, & Berry (1995) found that the *Wsd* added complementarity to the Lie Scale (*L*), and the Defensiveness Scale (*K*), differentiating well between students instructed to provide a favorable image of themselves, from those who responded honestly to the *MMPI-2*. Despite the existing evidence and limited research on the Wiggins scale, Graham (2000) suggested it was a good quality scale worthy of being included in the second generation of *MMPI-2* validity scales group.

When both scales are compared they appear to be different. The item composition for each scale was analyzed. Founding, on one hand, that 7 (21.21%) of the 33 items that constitute the Wiggins scale (*Wsd*) correspond with the *MMPI-2* Lie Scale (*L*), 4 (12.12%) with the *MMPI-2* Hypomania (*Ma*) items, and 3 (9.09%) with the MacAndrew Alcoholism Scale (*Mac-r*), the same items presented by the controlled-Hostility (*O-H*) scale. On the other hand, for the 37 items of the Edwards scale (*ESD*), 6 (16.22%) correspond to the *MMPI-2* Masculine Gender Role (*GM*) scales, 5 (13.51%) with the Defensiveness Scale (*K*), 4 (10.81%) with the *MMPI-2* Ego-strength scale (*Es*) and the same values all correspond with the Variable Response Inconsistency (*VRIN*) scale.

From these data three important elements can be noted: 1) the two scales do not share any items. 2) There are only two validity scales of the *MMPI-2* considered in each scale, the Lie Scale (*L*; 21.21%) in Wiggins, and the Defensiveness Scale (*K*; 13.51%) in Edwards. 3) None of them have a special impact on psychopathology indicative scales.

For the development of their scales, both Wiggins (1959) and Edwards (1953), used the 567 items that comprise the *MMPI-2*, although each different in number (33

for Wiggins and 37 for Edwards) and between them. Professionals using the MMPI-2 as an assessment tool may be interested in knowing which of the two scales offers better diagnostic accuracy, with the intention to choose one over the other. Based on this question, this research has a twofold objective: 1) To verify that both scales (*Wsd* and *ESD*) detect and discriminate, to a significant degree, people who simulate their responses on the MMPI-2 answering in a socially desirable manner; 2) To determine which one is better in terms of greater diagnostic accuracy, offering greater confidence to professionals in their psychological evaluations.

This matter was studied through the responses given by two groups of participants, each one instructed to respond to the MMPI-2 in different directions: the *honest response group* replied in an open and honest way, and the *simulated response group* did a simulated performance trying to present a more socially favorable image.

Method

Participants

The total number of participants for this study was $N= 583$ normal subjects (232 males and 351 females), with no evidence of any psychiatric or psychological disorder. The mean age of the sample was 28.34 years ($SD= 9.56$), with a range of 19 to 63. The sample was divided into two groups: honest response group and simulated response group.

The honest response group had to replied in an open and honest way following the instructions of the MMPI-2 manual, and is made up of $N= 310$ subjects (118 males and 192 females), with a mean age of 29.69 ($SD= 11.09$) for males and 29.28 ($SD= 9.72$) for women. The "Simulated Response Group" was given specific instructions to respond trying to present a socially favorable image of themselves, and is composed of $N= 273$ subjects (114 males and 159 females) with a mean age of 27.95 ($SD= 9.37$) for males, and 26.47 ($SD= 7.95$) for women. Demographic variables such as educational level, occupation, religion, ethnicity or socio-cultural level are not considered in the present study since they are not expected to have a particular impact on the results. All participants reside in different regional communities of the Spanish geography.

Materials and experimental design

In order to evaluate verbal cues, we used a video-recording, approximately 2 minutes long, about a robbery. Specifically, the film depicted a supermarket car-parking and the arriving of a pick-up; some hooded and armed men get down the pick-up and assault a security van; unexpectedly, two plainclothes policemen get down a parked jeep and a gun battle between robbers and policemen begins; one of the robbers tries to come up the pick-up holding a bag stolen from the security van, but he/she is shot by one of the policemen; another robber tries to get back the bag, but he/she drops it at once under the policemen's fire and comes back to the pick-up, leaving at high speed.

Instruments

The Spanish adaptation of the Minnesota Multiphasic Personality Inventory-2 (MMPI-2) (Ávila & Jimenez, 1999, Butcher et al., 1989) was used in the study. All the 37 items of the Edwards Scale ESD, and the 33 of the Wiggins Scale Wsd were extracted from the 567 that comprise the MMPI-2.

Procedure and design

The methodological approach has followed two lines: a quasi-experimental (post hoc) investigation since participants were assigned to groups before starting the study (Salkind, 1998), and a descriptive investigation to compare main differences between the social desirability scales, with the intention to prove which of them could show better diagnostic accuracy.

All participants responded voluntarily the MMPI-2 questionnaire. The honest response group was asked to follow guidelines on sincerity and self-reference. The simulated response group was given the following instruction in order to ensure the achievement of a proper socially desirable image: "You have in front of you a questionnaire with truth or false questions, to which you must answer giving a good positive image of yourselves".

Aiming to bring greater objectivity and consistency to the study, MMPI-2 protocols with a sum of double marks and blank responses above ≥ 30 , and those who reached a raw score of ≥ 15 (equivalent to 72T) in the VRIN variable, were eliminated.

Data analysis

All questionnaires were read by optical readers (Datascan, 2500) and scored with a specific software program (Leycotest). For the statistical analysis of the variables the SPSS 16.0 version was used. Based on the primary objective of the study, both scales, Edwards (ESD) and Wiggins (Wsd), were comparatively analyzed. Specifically, for each scale, analysis on the degree of homogeneity and reliability (Cronbach's α) were conducted. An analysis of their structure (factor analysis) was also done, and to simplify its interpretation, only the four factors with the greatest variance were selected, deleting in the Varimax Rotation absolute values lower than 0.40. Differences between the mean scores for each group were drawn. And their correlations with the traditional validity scales (L, F, K, VRIN) and the basic clinical scales of the MMPI-2 were obtained and analyzed as well. A Receiver Operating Characteristic (ROC) analysis was also conducted to determine accuracy of the scales.

Firstly developed in the 50s within the Theory of Decision (Swets & Pickett, 1982) and originally designed to detect radar signals, ROC analysis was latter on applied to the field of biomedicine (Zweig & Campbell, 1993), providing a good method to discriminate accuracy of assessment instruments. Therefore, with ROC values, it can be determined the specific contributions on diagnostic accuracy, sensitivity, specificity and predictive power for each of the two scales considered in the study.

Results

Using Cronbach's α as a measure of homogeneity of items, a significant difference between the two scales was found: 0.298 for Wiggins with 33 items ($N= 533$; 91.4% valid) and 0.745 for Edwards with 37 items ($N= 540$; 92.6% valid).

Table 1. Factor structure of the scales. Total variance explained.

Factors	Wiggins Scale (Wsd)		Edwards Scale (ESD)	
	Variance %	Accumulated %	Variance %	Accumulated %
1	18.823	18.823	18.911	18.911
2	5.862	24.684	4.461	23.372
3	4.694	29.379	3.797	27.169
4	4.274	33.652	3.633	30.801

Table 1, shows the factorial structure of items in which there is a remarkable similarity between the two scales across the variance of their first four factors. The first factor in each scale, is shown with an almost 19%.

In Table 2, the four factors with the greatest variance are presented. The first Wiggins element is composed of 8 items, four of which correlate with the Lie Validity Scale (*L*). Edwards's first element, with the same variance (18.9%), is composed of 4 items two of which correlate with the Masculine Gender Role (*GM*) Scale.

It becomes difficult to make an interpretation on the diagnostic implications of each scale (Wiggins and Edwards), for qualities such as: being sure of yourself, hardworking and laborious, realistic, controlled over their own feelings, sociable and polite, honest and altruistic, can be established by Wiggins scale. While being an open person, expansive, sociable, insensitive to criticism, eased in tense situations, and resistant to depression, might be the features that Edwards Scale could denote. But when it comes to diagnosis, both lack in the use of the psychopathological dimensions of the MMPI-2.

Table 2. Factorial structure of the scales. Rotated component matrix.

Wiggins Scale (<i>Wsd</i>)					Edwards Scale (<i>ESD</i>)				
<i>Factors</i>					<i>Factors</i>				
Items	1	2	3	4	Items	1	2	3	4
Wsd25				.441	So8	-.658			
Wsd29	.489				So31				.515
Wsd40		-.442			So48				.408
Wsd77	.501	-.535			So127	.480			
Wsd93	.599				So146	.619			
Wsd100		.579			So168				.727
Wsd133				.675	So172		.403		
Wsd184		.441			So221				.449
Wsd194	-.543				So238		.708		
Wsd201				.694	So243			.669	
Wsd203	.536				So289			.569	
Wsd207			.430		So299		.444		.405
Wsd211		.617			So335			-.722	
Wsd248	-.566				So420	.520			
Wsd326	.698				So469		.480		
Wsd341	.659								
Wsd345			.485						
Wsd351		.601							
Wsd354			.740						

Table 3 shows descriptive statistics by gender for each group in relation to each scale. The size effect ($d= 1.68$) obtained from the sincere response group ($N= 310$) and the simulated response group ($N= 273$) was acceptable. Significant differences are observed between mean scores of each study group and by gender.

Not assuming the homogeneity of variance (Levene's $F= 11.743$ for Wiggins and 29.763 for Edwards, $p<0.001$ in both), the t -test with the appropriate degree-of-freedom correction shows results of $t(509.611)= -28.421$; $p<.001$, between the two groups for the Wiggins scale, and, $t(570.430)= -16.117$; $p<.001$, for the Edwards scale.

Regarding to gender, differences are also significant. Assuming the homogeneity of variances in Wiggins [Levene's $F= 3.717$, $p= 0.054$], there are differences found between men and women, $t(581)= 2.410$, $p<.05$. In Edwards the results are on the limits of statistical significance, but still, not assuming the homogeneity of variance [Levene's $F= 5.047$, $p<.05$] the *degree-of-freedom correction* implies the existence of differences although not as intense, $t(528.564)= 1.974$, $p<.05$.

Table 3. Descriptive statistics for groups and gender.

Groups	Gender	Scales	Mean	Standard Deviation
Honest	Males	Wiggins (Wsd)	14.68	3.218
	(n = 118)	Edwards (ESD)	26.31	5.464
	Females	Wiggins (Wsd)	13.18	3.330
	(n = 192)	Edwards (ESD)	24.78	5.659
	Both	Wiggins (Wsd)	13.75	3.363
	(n = 310)	Edwards (ESD)	25.36	5.626
Simulator	Males	Wiggins (Wsd)	23.09	4.296
	(n = 114)	Edwards (ESD)	31.93	4.261
	Females	Wiggins (Wsd)	22.92	4.396
	(n = 159)	Edwards (ESD)	32.07	4.362
	Both	Wiggins (Wsd)	22.99	4.347
	(n = 273)	Edwards (ESD)	32.01	4.313

Table 4 shows correlations for Wiggins (*Wsd*) and Edwards (*ESD*) scales in both groups and with the Clinical Validity Scales of the MMPI-2. In general, results show a sign and value parallelism between groups.

First, a considerable negative correlation of both Social Desirability scales with most of the MMPI-2 Clinical Scales is present. These data confirms that none of these scales are positively related with any of the MMPI-2 pathology indicative variables. Second, in regards to the Validity Scales, both the *Wsd* and the *ESD*, showed higher and

significant correlations in the Simulated Response Group, with high values for *L*, *K* and *F* scales (the latter with a negative value).

For the Simulation Group, Wiggins scale had a greater association of $r = .668$ with the Lie scale (*L*), and less with the Defensiveness Scale (*K*), $r = 0.320$. By contrast, for the same group, Edwards had a better correlation with *K* scale ($r = .735$), and somewhat lower with the *L* scale ($r = .558$).

Table 4. Correlations of social desirability scales: Wiggins (Wsd) and Edwards (ESD), with the main MMPI-2 variables.

Honest (n = 310)			Simulators (n = 273)	
MMPI-2	Wiggins (Wsd)	Edwards (ESD)	Wiggins (Wsd)	Edwards (ESD)
Validity Scales				
Wsd	1	.089	1	.375**
ESD	.089	1	.375**	1
L	.466**	.286**	.668**	.558**
F	.028	-.639**	-.307**	-.776**
K	.040	.738**	.320**	.735**
VRIN	-.038	-.335**	-.192**	-.626**
Basic Clinical Scales				
Hs	.032	-.274**	-.322**	-.372**
D	-.157**	-.547**	-.148*	-.421**
Hy	-.070	-.080	-.148*	.098
Pd	-.121*	-.254**	-.228**	-.249**
Mf	-.269**	-.180**	-.017	-.013
Pa	-.025	-.486**	-.108	-.471**
Pt	-.129*	-.705**	-.152*	-.373**
Sc	-.029	-.655**	-.276**	-.544**
Ma	.192**	-.202**	.126*	-.238**
Si	-.244**	-.630**	-.486**	-.735**

Note: ** $p < .01$ (two tailed test); * $p < .05$ (two tailed test); L= Lie; F= Infrequency; K= Defensiveness; VRIN= Variable Response Inconsistency; Hs= Hypochondria; D= Depression; Hy= Hysteria; Pd= Psychopathic Deviate; Mf= Masculinity/Femininity; Pa= Paranoia; Pt= Psychastenia; Sc= Schizophrenia; Ma= Hypomania; Si= Social Introversion.

With the *ROC* method, the diagnostic accuracy of both scales was evaluated. A maximum value of accuracy of 1.00 and a minimum of 0.5 was established for the Area Under the Curve (*AUC*). In this analysis the honest response group was considered as negative and the Simulated Response Group as positive. Table 5 shows values of the comparative analysis between Social Desirability Scales. The *AUC* diagnostic accuracy

index for the Wiggins scale was higher showing significant difference between AUC areas (0.099, Standard Error = 0.019; $p < .001$).

Coordinates of *sensitivity* (probability of correctly diagnosing an individual with a particular disorder or disease) and *specificity* (probability of correctly diagnosing an individual with no disorder or disease) are also obtained. A cutoff point at 18 in Wiggins shows sensitivity (true-positives) close to 85%, meaning that, of 100 subjects with Social Desirability bias, 85 are correctly detected and the remaining 15 would be considered *false-negatives*. For Edwards, sensitivity is somewhat higher (close to 90%), being able to diagnose correctly almost 90% of those who actually have Social Desirability bias. In this matter, a good sensitivity index is highly valued, but proportions of false-negatives, may be considered clinically preoccupying the more serious the disorder or disease.

Table. 5. Statistics related to diagnostic accuracy between Wiggins (Wsd) and Edwards (ESD).

Statistics	Wiggins Scale (Wsd)	Edwards Scale (ESD)
Area under the curve (AUC)	0.939*	0.840
Standard Deviation	0.011	0.017
Confidence interval (95%)	0.916 - 0.957	0.808 – 0.869
Cutoff point	> 18	> 27
Sensitivity	84.98%	89.38%
Specificity	91.94%	64.19%
Positive predictive power (PP+)	90.3%	68.7%
Negative predictive power (PP-)	87.4%	87.3%

* $p < 0.001$

In the same way, the specificity shown by Wiggins was close to 92% (percentage of subjects with no Social Desirability bias), with a remaining 8%, that would be considered false-positives (scale does not detect existence of bias when present). For Edwards a lower specificity value was obtained (approximately 64%), suggesting greater probability of committing diagnostic errors.

Finally, the *Positive Predictive Power (PP+)* considered as the probability of a social desirability masking effect when the scales used confirm its presence, showed different results, indicating higher values for Wiggins scale 90.3% while Edwards was 68.7%. However when considering the *Negative Predictive Power (PP-; shown in Table 5)*, as the likelihood of absence of social desirability when the test says otherwise, is nearly equal for both. Figure 1 shows the ROC curve of each scale with reference of its

True-Positive and False-Positive coordinates, suggesting higher accurately for Wiggins Scale.

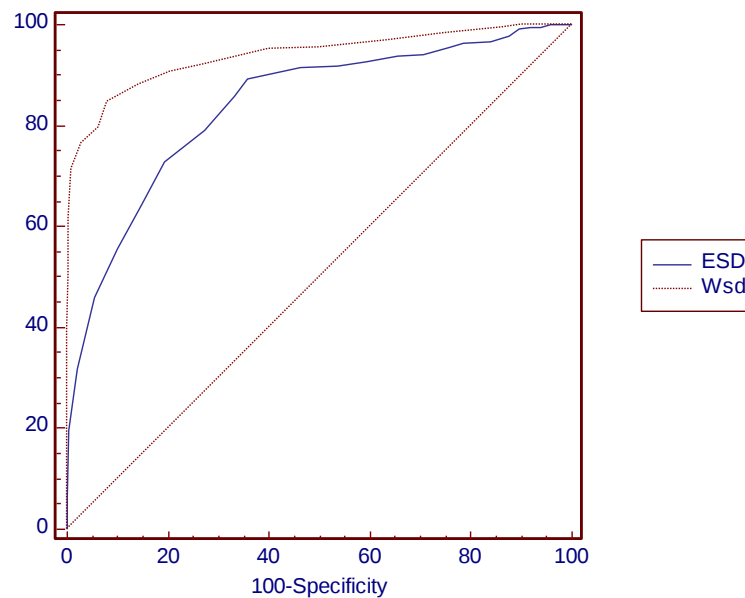


Figure 1. Diagnostic Accuracy of Wiggins (Wsd) and Edwards (ESD) Scales. ROC Curve

Discussion

This study found that both scales, Wiggins (Wsd) and Edwards (ESD), selecting different items, can discriminate between those who have responded honestly to the MMPI-2 and those who have tried to present a socially favorable image. It was also detected the absence of statistically significant differences between genders, regardless of their differentiative analysis.

Both, Edwards and Wiggins, were careful not to choose items with psychopathological connotations (Greene, 2000). Perhaps the only variable that occurs with some incidence in the Wsd and the ESD is the MMPI-2 Hypomania (Ma), but correlations in general, of both scales in each group, were all found to have a negative association with most of the Basic Clinical Scales of the MMPI-2 (see Table 4).

A previous attempt to overcome the limitations encountered in Edwards scale (1957) was made by Crowne and Marlowe (1960) with their Social Desirability Scale (SDS), developed with 39 MMPI items that contained several psychopathological implications. This limitation is still important when professionals seek to assess

personality traits with a technique such as the MMPI-2. For the person involved, it may seem too obvious and easy to present the best of itself or try to deny or underestimate any psychopathology, if benefits can be obtained. This technique makes it too easy despite receiving instructions on sincerity and honesty.

Difference found related to the homogeneity among items carried out by a Cronbach α coefficient, showed a higher item dispersion in Wiggins, quite different from that seen in Edwards. By contrast in the factorial structure of these scales, remarkable similarities were found in both the variance of the first factor (Table 1), as in the composition of items for each of the four factors, who all seemed to denote the same favorable image but in different context situations (Table 2). This implies that while Wiggins would identify a person as being sure of him- or her-self, hardworking and laborious, realistic, controlled over their own feelings, sociable and polite, honest and altruistic, in the same way, Edwards would identify it as being insensitive to criticism and anxiety, quiet, self-assured, emotionally positive, sociable, open and expansive. What is the difference then? It would be necessary to use the scales that make up their items to find any discrepancies.

In the composition of items presented on Edwards (ESD), 6 correspond to the Masculine Gender Role (GM) Scale, and do not exist in Wiggins. Their interpretation is based on clinical judgment associated with positive attributes that are socially desirable. In the same way, the 4 items that correspond to the Ego-strength Scale (ES) are presented as a general indicator of mental health associated with spontaneity, good contact with reality and the ability to cope with everyday life problems and recover from its consequences. Other correlations indicate that Wiggins has a high association with the Lie Scale (L) and Edwards with the Defensiveness Scale (K). Paulhus (1986) had interpreted that the Wsd scale seems to be related with the manipulation of personal image in the attempt to deceive others, while ESD seemed to refer to a similar manipulation but in the attempt to deceive one's self. No data is available in this study to contrast this opinion.

Aiming to compare which scale showed a better diagnostic accuracy, a ROC analysis was performed contrasting the responses of each group to both social desirability scales (Wiggins and Edwards). Diagnostic accuracy is reported by a number of statistics presented in Table 5. The indicator that best summarizes it is the area under the curve value (AUC), on which one can appreciate that both scales show good accuracy, though significantly higher in Wiggins scale. Figure 1 refers that superiority,

interpreting that the more the curve gets closer to the diagonal that runs from the lower left corner to the upper right corner, the lower is the diagnostic accuracy of the examined scale.

Results reported by Wiggins (1959, quoted by Greene, 2000) on a cutoff point that could identify 75% respondents showing a favorable social image, from those who answered the MMPI-2 honestly (98%), are remarkably similar to results obtained in this study. Similarly, the study by Baer, Wetter, and Berry (1992, quoted by Greene, 2000) on Edwards scale, about people who underestimated their disease, found an optimal cutoff point of 35 that could correctly identified 79% of simulators and 63% of honest respondents. The results in Table 5 show similar values to correctly discriminate simulators.

In Table 5, it can also be observed the values of predictive power (positive and negative), indicating the superiority of the Wiggins scale. But as data shows, its diagnostic accuracy is far from 100%.

When using the MMPI-2 to detect Social Desirability simulators, personality evaluation professionals, should take into account the existence of other validity scales (L, K, VRIN) that should be complemented with the data on Wsd and the ESD scales supplied by this study. Being both adequate at identifying social desirability, the Wsd of Wiggins gives a better contribution to reach an accurate diagnosis on this matter in the MMPI-2.

By referring to the found superiority and preferred implementation of one scale over the other on the MMPI-2, this study is implicitly suggesting no complementarity between the two scales, for the simple reason that, although each scale uses different items on the MMPI-2, doesn't seem appropriate to have two scales measuring the same construct. Complementarily is linked to the already existing values of the Infrequency Validity Scale (F), or the Defensiveness Scale (K).

This study took account of the exclusion criteria listed by the traditional normalization protocols of the Spanish adaptation of the MMPI-2 (Ávila & Jimenez, 1999), that in turn are based on those proposed by Butcher (1995, quoted by Butcher, 2006, p. 29). "It must be admitted that the absence of TRIN, although it's a scale used to detect the tendency to give true or false answers regardless of the content of the item" (Butcher, 2006, p. 29), should have been considered in this study in order to exclude protocols.

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