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## The South Oaks Gambling Screen (SOGS): A rebuttal to critics

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## Abstract

A review of the literature reveals strong support for the construct validity of interpretations based on scores obtained with the original and more recent versions and/or variants of the South Oaks Gambling Screen (SOGS). Criticisms of the SOGS are shown to lack merit, to be offset by more important criteria, or to be no longer relevant. The evidence reviewed indicates that the construct of pathological gambling as represented by the SOGS and its variants provides a robust definition and implies that the SOGS meets the important criterion of validity generalization. The construct of chasing and behaviors related to chasing is shown to provide powerful measures by which to discriminate between the presence and absence of pathological gambling. The viability of the SOGS to continue to make important contributions to the understanding of pathological gambling is discussed in terms of the criteria for selecting a research instrument.

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## Introduction

The South Oaks Gambling Screen (SOGS) ([Lesieur & Blume, 1987](#)) has been the subject of a number of critical reviews (e.g., [Battersby, Thomas, Tolchard, & Esterman, 2002](#); [Gerstein et al., 1999](#); [Shaffer & Korn, 2002](#); [Volberg, 1999](#); [Walker & Dickerson, 1996](#)), beginning with [Culleton's analysis of methods \(1989\)](#). This has led to calls for replacement of the SOGS as the primary research instrument used in prevalence studies of the general population.

Although [Lesieur \(1994\)](#) and [Gambino \(1997\)](#) have provided responses to some of the issues, it is clear that a more detailed response is needed. Our goal is to demonstrate that the SOGS remains an important and viable choice among current alternatives by arguing the case that the major criticisms lack merit, are outweighed by other criteria, or are simply no longer relevant.

The SOGS is a 20-item instrument initially developed to screen clinical populations, for example, substance abusers, for the presence of pathological gambling. Responses to the 20 items are summed, and endorsement of 5 or more items is interpreted as evidence of the presence of pathological gambling. Criteria

from the DSM-III and DSM-III-R were used in the development of the SOGS; the interested reader will find the original validation data in [Lesieur and Blume \(1987\)](#). The first use of the SOGS as a screen to detect pathological gambling in the general population was by [Volberg and Steadman \(1988\)](#). It is impossible in a short report to do justice to a review of the SOGS. We have therefore limited our response to what we believe are the most relevant and important issues. A more detailed report by the second author is available by request at [hlesieur@lifespan.org](mailto:hlesieur@lifespan.org). This includes an extensive list of references through early 2003 and a set of summary tables. In part, the criticisms leveled at the SOGS reflect the scarcity of systematic reviews and evaluation of the literature, i.e., meta-analysis. The references compiled by the second author should provide an excellent starting point for those investigators planning such analyses.

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## A brief review

A wide selection of validation strategies have been employed to demonstrate the validity of the SOGS. These include the use of single-stage (e.g., [Gambino, 1997](#); [Poulin, 2002](#)) and multiple-stage (e.g., [Abbott & Volberg, 1996](#); [Abbott, Williams, & Volberg, 1999](#); [Gambino, 1999a](#)) designs, a description of the mathematical models for evaluating the accuracy of estimates based on these designs ([Gambino, 1997, 1999a](#)), and methods for evaluating the precision and cost-efficiency of these designs ([Gambino, 1999b](#)). Other investigators have employed statistical modeling techniques for the purpose of validation, including factor analysis (e.g., [Winters, Stinchfield, & Fulkerson, 1993](#)), logistic regression (e.g., [Poulin, 2002](#); [Welte, Barnes, Wiczorek, Tidwell, & Parker, 2001](#)), Rasch analysis ([Strong, Lesieur, Breen, Stinchfield, & Lejuez, 2004](#)), and stratification analysis (e.g., [Tavares, Zilberman, Beites, & Gentil, 2001](#)).

Evidence supporting the psychometric soundness of the SOGS, while less extensive than evidence that supports the validity of the many applications of the SOGS, continues to be accumulated (e.g., [Abbot & Volberg, 1996](#); [Lesieur & Blume, 1987](#); [Stinchfield, 2002](#); [Winters et al., 1993](#)). These include measurement of internal validity (e.g., [Stinchfield & Winters, 2001](#); [Volberg, 2002](#); [Welte et al., 2001](#)), the use of concurrent validation strategies (e.g., [Doiron & Nicki, 2001](#); [Westphal & Johnson, 2000](#)), postdictive or retrospective criterion validity (e.g., [Gambino, Fitzgerald, Shaffer, Renner, & Courtnage, 1993](#); [Ladouceur, Jacques, Giroux, Ferland, & Leblond, 2000](#)), and the use of convergent and discriminant validation strategies (e.g., [Lesieur & Blume, 1987](#); [Stinchfield, 2002](#)). Convergent validity as demonstrated by the correlation between the SOGS and its variants with the DSM, both earlier and current versions, is impressive in its consistency and ranges from moderate (e.g., [Sproston, Erens, & Orford, 2000](#)) to high (e.g., [Welte et al., 2001](#)). These correlations hold for both clinical ([Stinchfield & Winters, 2001](#)) and general ([Stinchfield, 2002](#)) population samples as well as comparisons among

both adult and adolescent versions (e.g., [Volberg, 1996, 1998](#)).

Much of the criticism of the SOGS has its roots in the failure to recognize what qualify as statements of validity ([Gambino, 2003a](#)). For example, the proposed relationships between pathological gambling and frequency of gambling (e.g., [Hing & Breen, 2001](#)), duration of gambling (e.g., [Wong, McAuslan, & Bray, 2000](#)), distance to gambling (e.g., [Gerstein et al., 1999](#)), and expenditures on gambling ([Cox, Kwong, Michaud, & Enns, 2000](#)), are *all statements of construct validity* ([Cronbach, 1988](#)). Recent epidemiologic studies have provided additional support by employing the SOGS to measure the strength (relative risk) and magnitude (attributable risk) of the relation of pathological gambling to suspected indicators of enhanced risk such as age, adults versus adolescents; severity, clinical versus general populations (e.g., [Shaffer, Hall, & Vanderbilt, 1997](#)); and comorbidity, e.g., substance use disorders (e.g., [Feigelman, Wallisch, & Lesieur, 1998](#)).

Several investigators have used the SOGS to search for the putative causes of pathological gambling in terms of genetic (e.g., [Walters, 2001](#)) or neurobiological (e.g., [Ibáñez, Blanco, de Castro, Fernandez-Piqueras, & Saiz-Ruiz, 2003](#)) factors; track its natural history (e.g., [Shaffer & Korn, 2002](#)); and measure the progression from gambling onset to diagnosis of pathological gambling (e.g., [Tavares et al., 2001](#)). Others have employed the SOGS to examine the construct of pathological gambling from a theoretical perspective, e.g., the debate over whether to view pathological gambling as an obsessive-compulsive or addictive disorder ([Frost, Meagher, & Riskind, 2001](#)).

If pathological gambling lies on a continuum of severity ([Shaffer & Korn, 2002](#)), then strong support for the validity of the SOGS would be found by showing that predictions of pathological gambling, in terms of the likelihood that a specific score discriminates the pathological from the nonpathological gambler, should increase as scores on the SOGS increase. Evidence in support of the SOGS is presented in [Table 1](#) employing the likelihood ratio (LR). The LR is a measure recommended by clinical epidemiologists for validating clinical indicators and instruments ([Kraemer, 1992](#)). LRs can be used to validate individual clinical indicators, diagnostic and screening tests, or a range of test scores. The interested reader will find more detailed descriptions elsewhere ([Chu, 1999](#); [Koch, Capurso, & Llewelyn, 1995](#); [Kraemer, 1992](#); [McGee, 2000](#); [Sackett, Haynes, & Tugwell, 1991](#); [Schmitz, Kruse, & Tress, 2000](#); [Zhou, Obuchowski, & McClish, 2002](#)).

The LR provides an empirical measure of the goodness of a test definition (or individual criterion) by defining the odds of finding a particular test result in those with versus those without the disorder. It is this *difference* of frequency of occurrence that is looked for when assessing the validity of a symptom, sign, or test result ([Koch et al., 1995](#)). It measures the degree of certainty with respect to the diagnosis being confirmed. Larger values for the LR are interpreted as

indicative of greater certainty that the presumptive diagnosis is correct; i.e., one may have greater confidence in the diagnosis. Values of LR equal to one mean that the results have no diagnostic value, and values of LR less than one indicate that the disorder is less likely to be present.

The LR is defined as the true-positive rate (sensitivity) divided by the false-positive rate (1 – specificity). Estimates of sensitivity and specificity were obtained following well-established procedure ([Zhou et al., 2002](#)). Sensitivity was estimated by assuming that gamblers in treatment represent individuals known to have the disorder; specificity was estimated by assuming that gamblers from the general population represent individuals free of the disorder. These are surrogate definitions since there will be some probability that some gamblers in the general population will be false negatives and some probability that some gamblers in treatment will be false positives. The use of these two populations as surrogates is reasonable since the analysis assumes that these labels apply on average, and not in any individual case ([Schlesselman, 1982](#)). This form of validation is equivalent to correlating test items with the total score. The LR provides an empirical estimate of the power of an instrument, one or more items, or a range of scores to discriminate the pathological gambler from the nonpathological gambler. The LR is interpreted as a measure of the credibility of the instrument or item(s) in accounting for the empirical evidence ([Clayton & Hills, 1996](#)).

[Table 1](#), based on a reanalysis of [Stinchfield's data \(2002\)](#), provides evidence to support this view and demonstrates that the SOGS meets this strong criterion for validity as indicated by increasing estimates of the LR with increasing scores on the SOGS.

The evidence clearly demonstrates support for the validity of the SOGS as an instrument for research on both clinical and general population samples (e.g., [Volberg, 1994](#)), its usefulness in case finding in clinical (e.g., [Petry & Armentano, 1999](#)) and correctional settings ([Walters, 1997](#)), the identification and testing of hypotheses about the determinants of pathological gambling (e.g., [Cox et al., 2000](#); [Gambino et al., 1993](#)), and its usefulness in evaluating treatment outcomes (e.g., [Stinchfield & Winters, 2001](#)) and tracking long-term changes in prevalence rates among adults ([Volberg & Moore, 1999](#)) and adolescents ([Winters, Stinchfield, Botzet, & Anderson, 2002](#)), among others.

In sum, the SOGS has been employed for a multitude of purposes, in a wide array of settings, with diverse populations and cultures, and has been translated into at least 36 languages for use on six continents (contact the second author for a list of SOGS translations). These studies have found consistent replicable relationships between pathological gambling, as measured by the original and revised versions of the SOGS; personal attributes across times, places, communities, and clinical settings; and comparison with other instruments. The consistency of these findings

provides strong support for the construct validity of the SOGS (e.g., [Beaudoin & Cox, 1999](#); [Hodgins & el-Guebaly, 2000](#)).

Our review of the evidence in support of the validity of the SOGS is not presented as an argument that efforts to develop alternatives are misguided. Indeed, the continuing appearance of studies designed to validate improved alternatives is to be encouraged and represents a welcome challenge (e.g., [Cunningham-Williams & Cottler, 2001](#); [Fisher, 2000](#); [Gerstein et al., 1999](#); [Smith & Wynne, 2002](#); [Stinchfield, Govoni, & Frisch, 2001](#)). Comparisons among alternative instruments will continue to help identify the strengths and weaknesses in contrasting and related views on how to define the construct of pathological gambling; it may be expected that the SOGS will continue to contribute to this important task.

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## Criticisms of the SOGS

**The initial evaluation.** The criticism that the SOGS was validated on clinical samples, thus making invalid its application to the general population, was reasonable, but it should not have been implicitly accepted in the absence of support for or against the application's validity. The apparent unquestioning acceptance of this criticism represents a failure to understand that it is not the test that is being validated, but inferences and conclusions based on test score interpretations ([Rubin, 1988](#)). This criticism has subsequently been shown to be unwarranted in view of the strong support for the construct validity of findings employing the SOGS and its variants in studies of the general population. More specifically, recent research has validated the SOGS with general population samples in a number of settings and cultures (e.g., [Abbott & Volberg, 1996](#); [Volberg, Abbott, Ronnberg & Munck, 2001](#); [Stinchfield, 2002](#); [Volberg & Vales, 1998](#)

**Items on the SOGS.** An additional set of criticisms revolve around the specific items on the SOGS, particularly its emphasis on borrowing. [Table 2](#) presents an analysis of the 20 SOGS items, based on the data reported by [Stinchfield \(2002\)](#), that rebuts this criticism. The primary measure employed in [Table 2](#) is the LR described earlier. An interpretation of the LR has been provided by [Jaeschke, Guyatt, and Sackett \(1994\)](#). These investigators propose the following interpretive guidelines: greater than 10 (large, often conclusive), 5 to 10 (moderate), 2 to 5 (small but sometimes important), and 1 to 2 (small, rarely important). The data show clearly that exceptionally high LRs were obtained for all items.

Two findings are of special interest. First, chasing as defined in the [Stinchfield \(2002\)](#) study ([Table 2](#)) is a strong discriminant (LR = 57.1) for separating pathological and nonpathological gamblers. Second, the five most discriminative items and seven of the top ten were items assessing borrowing. In view of the

importance of the concept of chasing as a major characteristic of the pathological gambler ([Lesieur, 1984](#)) and the obvious relationship between chasing and the need to obtain money to chase, the discriminatory power of items on borrowing should not be surprising. These results provide additional strong support for the concepts embedded in the SOGS.

It needs to be emphasized that not all forms of borrowing discriminate between pathological and nonpathological gamblers; only forms of borrowing that discriminate between these two groups were included in the original SOGS (second author). It has been suggested that a better alternative is to replace the questions on borrowing with an omnibus question. The above analysis indicates that this may be expected to result in the generation of false-positive responses. In a similar vein, analysis of DSM-IV (first author), employing the validation results reported by [Stinchfield et al. \(2001\)](#), revealed that while chasing was the second most endorsed item (88%) by gamblers in treatment, slightly less than preoccupation (91%), it was the second poorest discriminant (LR = 12.1), reflecting the high proportion of nonpathological gamblers who endorsed this item (7.3%).

[Lesieur \(1984\)](#) has noted the importance of the distinction between short-term chasing, which is common among regular gamblers, and long-term chasing, which is not. In addition, research conducted for the original SOGS (contact the second author) found chasing “most of the time” after losses effectively discriminated, while chasing “less than half the time” the gambler lost did not! Accordingly, “less than half the time I lost” is not given a point in the SOGS while “more than half the time” is accorded a point in the 20-item screen. It is critical for researchers to take care to properly word the item to reflect this important distinction. Failure to do so will, as in the case of using an omnibus question on borrowing described above, generate additional false-positive responses.

**Changing criteria.** Arguments that the changing nature of the definition of pathological gambling has invalidated the SOGS are not persuasive. First, the lack of a gold standard for pathological gambling leaves unanswered the question, on what basis is the replacement of one set of criteria, e.g., DSM-III, DSM-III-R, with another definition, e.g., DSM-IV, justified? Recent examples of debate over the changing of diagnostic criteria that illustrate the issues include acute myocardial infarction (e.g., [Pell et al., 2003](#)) and diabetes mellitus (e.g., [Borch-Johnson & Vej, 1998](#)). The question of replacing old criteria with new criteria is an important one, but remains a difficult one to resolve due to the lack of accepted standards for evaluation ([Zhou et al., 2002](#)).

Second, the selection of which criteria to validate is typically the result of agreement by a panel of experts ([Koch et al., 1995](#)). The problems with the use of experts to establish diagnostic criteria have been detailed elsewhere ([Kupfer & Regier, 2002](#)), but in the main reflect the lack of rigorous diagnostic standards and

the biases inherent in subjective judgments. Additional problems facing the experts include such factors as the historical lack of funding to support a series of rigorous validation studies (e.g., [Cunningham-Williams & Cottler, 2001](#); [Zhou et al., 2002](#)), the lack of a consensus on a conceptual model of pathological gambling (e.g., [Walker & Dickerson, 1996](#)), and limitations imposed by the amount and quality of extant research available for evaluation (e.g., [Lesieur & Rosenthal, 1991](#)).

**Liberal versus conservative estimates.** A related issue is the argument that the SOGS provides more liberal estimates than DSM-IV. This argument is misleading for three reasons. First, it implies that DSM-IV estimates are more accurate, i.e., valid, than the SOGS, or that those gamblers identified by DSM-IV are somehow more clinically relevant. In the absence of a gold standard, and in the face of such evidence as the ability of the items on the SOGS to discriminate true positives from false positives, neither implication can be justified.

Second, the emphasis on crude prevalence rates is misplaced ([Gambino, 2003b](#)). Crude prevalence rates are always a function of stratum-specific rates, e.g., gender differences, and will always overestimate some stratum-specific rates, e.g., females, and underestimate others, e.g., males. Stratum-specific rates are generally more informative for the purposes of identifying risk determinants, planning interventions such as screening programs, and designing prevention programs ([Abramson, 1996](#)).

Finally, stratum-specific rates may be converted into measures of relative risk and attributable risk percent ([Shaffer et al., 1997](#)). The use of these measures provides a means of comparing instruments (e.g., the SOGS and DSM-IV) that has the advantage of being independent of crude prevalence rates. For example, if the rates for males and females are 4% and 2%, respectively, using SOGS, but only 2% and 1% using DSM-IV, the relative risks will be two to one for both instruments while attributable risk percent will be  $(2 - 1)/2 \times 100 = 50\%$  ([Gambino et al., 1993](#)).

**The use of lifetime measures.** The argument that only lifetime measures are used is no longer relevant; researchers now routinely employ current measures of prevalence, such as 6-month ([Abbott & Volberg, 1991](#)), past-year ([Welte et al., 2001](#)), and lifetime prevalence rates ([Volberg, 1994](#)). This argument was based, in part, on the failure of lifetime measures to discriminate between current cases and those in remission. The additional argument that lifetime measures are of no practical value is based on a misunderstanding. Lifetime measures are of limited use unless tied directly to age-specific strata; otherwise they cannot be properly interpreted ([Abramson, 1996](#)). Lifetime measures remain important indicators of the potential burden on the community; for example, with the advent of Internet gambling, former pathological gamblers may be more susceptible to relapse in the context of this medium. Under these conditions, the use of current estimates would clearly underestimate the potential burden in the community. An additional issue,



often overlooked, is that sensitivity will decrease and specificity will increase as the time frame for measurement decreases ([Gambino, 2005](#)). This serves to mitigate the original argument, based on lifetime measures, that the SOGS generates too many false positives ([Culleton, 1989](#); [Dickerson, 1993](#); [Shaffer & Korn, 2002](#)). It should also be emphasized that the original false-positive criticism ([Culleton, 1989](#)) rested on an invalid premise and is by extension an invalid argument ([Gambino, 1997](#)).

**Choosing an instrument.** Finally, and we believe most important, the choice of instrument should not be based *solely* on the most recent diagnostic criteria. There are a number of reasons to select a specific research instrument ([Gambino, 1997](#)). These include replication, comparability, knowledge of the properties and performance of the instrument under specific conditions, the goals of the study, the interests of the researcher, or simply the preference of funding sources ([Robins, 1995](#)).

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## Discussion

Validity refers to the usefulness of interpretations of test scores as these are applied for a specific purpose ([Messick, 1988](#)). This view is credited to [Vernon \(1963\)](#) and raises an important issue. As Kline observes, “a truly scientific psychometric test would be valid *per se* [author's italics], that is, for all purposes to which the test might legitimately be put” (2000, p. 34). A strict interpretation of the specificity argument states that changing one word or one question creates the need for a new validation study.

This may be true in the technical sense, but has not been found to hold in practice where consistent relations between scores on the SOGS and indicators of enhanced risk have emerged. The consistency and replicability of the observed relationships with different forms of the SOGS indicate that the general construct of pathological gambling as represented by the SOGS and its variants is robust. This implies that the validity of the SOGS is generalizable across situations, settings, samples, variants, and versions. Validity generalization ([Schmidt & Hunter, 1998](#)) has received strong endorsement in the most recent revision of the standards for testing as an important measure of support for validity ([American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 1999](#)) and is the subject of a recent edited volume ([Murphy, 2003](#)). Considering the time, costs, and resources needed to conduct each new validation study, this robustness of the SOGS is a valuable asset.

For example, investigators may take advantage of the robustness of the SOGS to improve future versions by amending those items that show moderate to low levels of discrimination between gamblers in treatment (true positives) and gamblers in

the general population (false positives). The relatively high proportions of false positives for the last four items in [Table 2](#) suggest the need to reword these items to make them more specific. For example, the item most frequently endorsed by gamblers in treatment (92%), “gamble more than you intended,” was also endorsed by 5.5% of gamblers from the general population. This question might be reworded, following [Lesieur's \(1984\)](#) recommendation on defining chasing, in terms of the frequency of occurrence of this behavior, e.g., more than half the time (positive) versus less than half the time (negative), in order to better discriminate true positives from false positives.

We emphasize that our defense of the SOGS does not imply any argument that the SOGS *must* or *should* be used instead of, or in place of, DSM-IV or other instruments. That would be not only an unrealistic position, but one without merit. The issue that faces the clinician or researcher is “how to choose among the riches” ([Robins, 1995](#), p. 243). The case we have sought to make is that it is premature to reject the SOGS, particularly in view of the projected publication of DSM-V in 2010 or later ([Kupfer et al., 2002](#)). To do so would result in the loss of valuable information about the relations we study.

A more productive strategy is to supplement the SOGS (DSM-IV), when feasible (e.g., budget constraints), with a second test, e.g., DSM-IV (SOGS) (e.g., [Volberg, 1996](#); [Welte et al., 2001](#)). This has a number of advantages, such as permitting the investigator to obtain estimates of test accuracy in the form of measures of sensitivity and specificity ([Gambino, 1999a](#)). It also provides a bridge between the SOGS, DSM-IV, and the transition to DSM-V by helping to establish a solid foundation of validated knowledge based on multiple tests, i.e., convergent validation. An example is the use of the SOGS together with criteria from DSM-III-R and DSM-IV to develop and validate a new scale for the purposes of measuring the severity of pathological gambling ([Koeter, de Fuentes-Merillas, Schippers, & van den Brink, 2003](#)).

We close with three observations. First, “it is important to build on the foundation of work already done” ([Volberg, 1999](#), p. 40). Second, the use of the SOGS has served researchers well in their study of pathological gambling and its correlates; it should continue to do so when applied to those situations in which conditions support its relevance and usefulness, e.g., replicability of previous research based on the SOGS. Since the majority of prior studies have been conducted employing variants of the SOGS, this is a particularly important criterion for choice of instrument.

Our third and final observation is a historical one. The original intent of Lesieur and Blume in development of the [SOGS \(1987\)](#) was its application to the screening of substance abusers for the presence of pathological gambling. The historical, social, and economic factors that resulted in the overwhelming selection of the

SOGS as the instrument of choice over the last 18 years could not have been anticipated. With hindsight and evidence in hand, however, it would appear that the choice was clearly a productive one in terms of knowledge gained. We need only point to the many studies employing the SOGS, or one of its variants, that appeared in the final report by the National Research Council on pathological gambling ([Committee on the Social and Economic Impact of Pathological Gambling, 1999](#)).

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## Tables

**Table 1**

LRs based on general population and gambling treatment samples

Score on SOGS	Se	1 – Sp	LR
> 0	1.00	.159	6.49
> 1	.996	.066	15.09
> 2	.991	.043	23.04
> 3	.988	.028	35.28
> 4	.985	.017	57.92
> 5	.976	.013	75.04
> 6	.948	.008	118.5
> 7	.893	.006	148.83
> 8	.841	.001	841
> 9	.765	.000	∞

Se = sensitivity, based on responses of treatment sample ( $N = 327$ );  $1 - Sp = 1 - \text{specificity}$ , based on responses of general population sample ( $N = 845$ );  $LR = Se / (1 - Sp)$ .

**Table 2**

LRs based on general population ( $1 - Sp$ ) and gambling treatment (Se) samples

SOGS item	Se	1 – Sp	LR <sup>a</sup>
Cashed in stocks	17.0	0.0	∞
Borrowed from loan sharks	5.0	0.0	∞
Borrowed money and not paid them back	52.0	0.1	520.0
Borrowed from banks	40.0	0.1	400.0
Sold personal or family property	35.0	0.1	350.0
Lost time from work	49.0	0.2	245.0
Felt like you wanted to stop but didn't think you could	81.0	0.4	202.5
Borrowed from relatives or in-laws	48.0	0.4	120.0
Borrowed from checking account	54.0	0.5	108.0
Had money arguments centered on gambling	64.0	0.6	106.7
Felt you had a problem	91.0	0.9	101.1
Hid betting slips	74.0	0.9	82.2
Borrowed from credit cards	44.0	0.7	62.9
Borrowed household money	70.0	1.2	58.3
Went back another day to win back money (chasing)	80.0	1.4	57.1
Borrowed from spouse	33.0	0.6	55.0
Criticized by others for your gambling	83.0	3.0	27.7
Felt guilty	90.0	3.7	24.3
Gambled more than you intended	92.0	5.5	16.7
Claimed to be winning money gambling but weren't	52.0	4.5	11.6

Se = sensitivity, based on responses of treatment sample ( $N = 327$ );  $1 - Sp = 1 -$  specificity, based on responses of general population sample ( $N = 845$ ) of gamblers who did not meet criterion;  $LR = Se/(1 - Sp)$ .

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Keywords:

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construct validity

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validation strategies

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validity generalization

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diagnostic criteria

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pathological gambling

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South Oaks Gambling Screen

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SOGS

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