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HR EXCELLENCE IN RESEARCH

La misurazione in ambito di gioco d'azzardo problematico: fondamenti psicometrici

Maria Anna Donati

24 Giugno 2026

- Ricercatrice di Psicometria presso il Dipartimento NEUROFARBA dell'Università di Firenze
- Insegnamenti presso:
 - Scuola di Psicologia
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- Psicologa iscritta all'Ordine degli Psicologi della Regione Toscana

○ Aree di ricerca

- Costruzione e adattamento di strumenti di misura
- Messa a punto e verifica di modelli esplicativi
- Costruzione e valutazione di interventi di prevenzione



○ Interessi di ricerca

- Gambling e videogaming (Loot Boxes)
- Uso problematico del cellulare
- Uso di alcol e fumo di sigarette
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Lab of Psychometrics - NEUROFARBA Department

The Lab of Psychometrics is part of the Department of Neurosciences, Psychology, Drug Research and Child Health (NEUROFARBA) University of Florence.

Research activities:

- the construction and adaptation of measurement tools for psychological assessment through Classical Test Theory (CTT) and Item Response Theory (IRT);
- the study of efficacy and effectiveness of preventive interventions.



Costanza
Gori



Laura
Di Leonardo

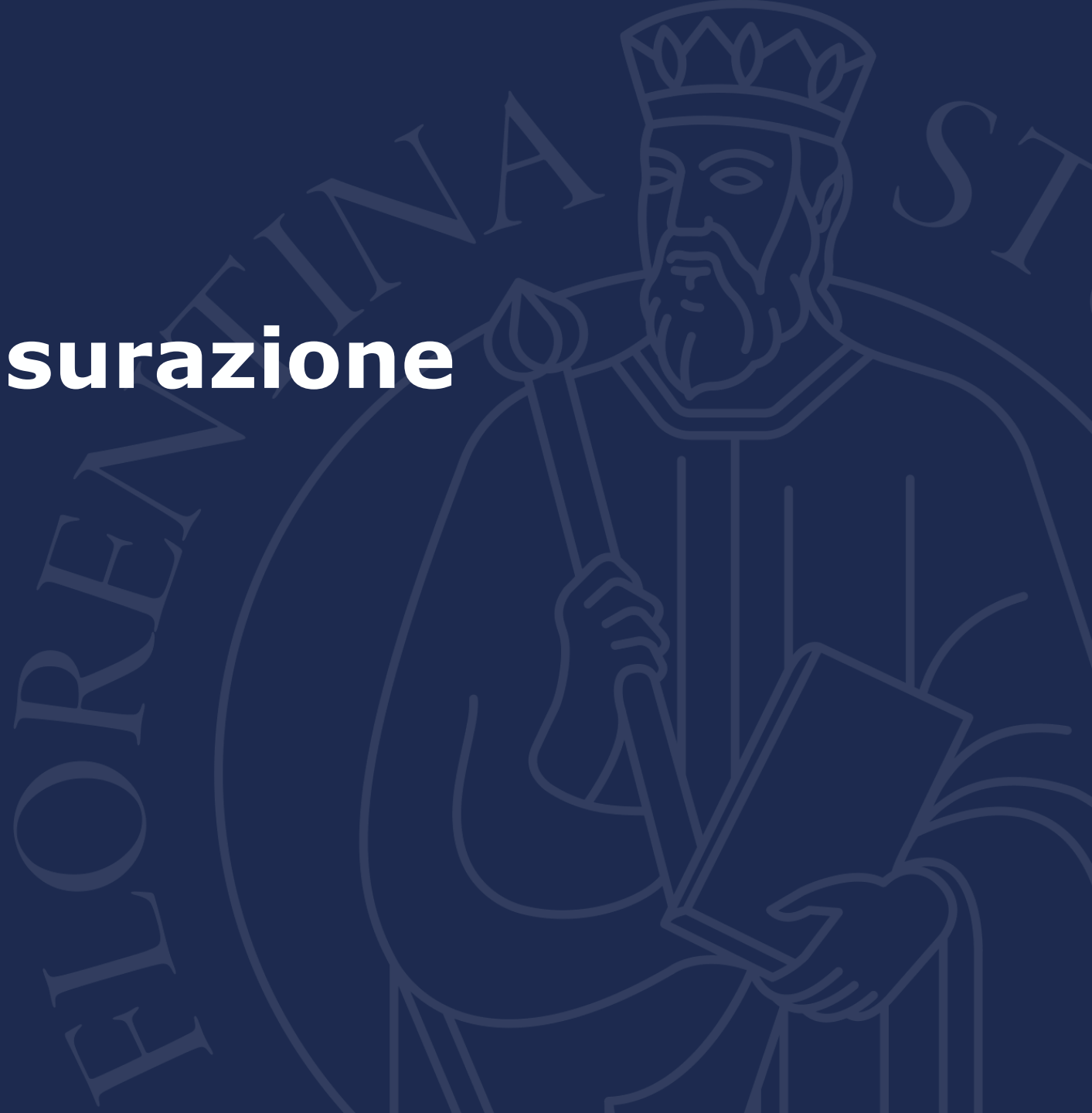


Sofia
Santisi



Chiara
Testi

#Misurazione



- **Cosa misuriamo? Variabili**

- Una variabile è qualsiasi attributo o caratteristica che può variare, cioè può cambiare: assumere **valori** o **categorie** diverse
 - La variabile è $\neq$ da una *costante*, che invece è una caratteristica che NON varia tra i casi

- **Su chi misuriamo? Casi**

- Caso o partecipante (non soggetti) è ciò a cui si attua la misurazione

- Ansia
 - Socialità
 - Aggressività
- Caratteristiche non direttamente osservabili:
COSTRUTTI LATENTI
- Possono essere misurati attraverso dei comportamenti osservabili
operazionalizzati in relazione a quel costrutto: **INDICATORI OSSERVABILI**
(comportamenti/stati
d'animo/sentimenti/pensieri)

- Gli indicatori devono essere definiti in base ad un modello teorico di riferimento
 - Spesso la definizione teorica di un fenomeno o costrutto varia da modello a modello
 - Spesso il disaccordo tra modelli rende problematica la misura del fenomeno
 - ***E' la teoria, descrivendo le caratteristiche del fenomeno, a determinare le sue misure***

- Costrutto e indicatori sono tenuti insieme attraverso il **processo di misurazione**
- **Misurazione** è quel procedimento che ci permette di rilevare le modalità con cui si manifestano le variabili
- Consiste in un insieme di **regole** usate per **assegnare dei numeri** in modo da riuscire a **rappresentare numericamente** le quantità/qualità di attributo presenti in quell'oggetto e quindi **classificare gli oggetti**

Chiorri, 2020

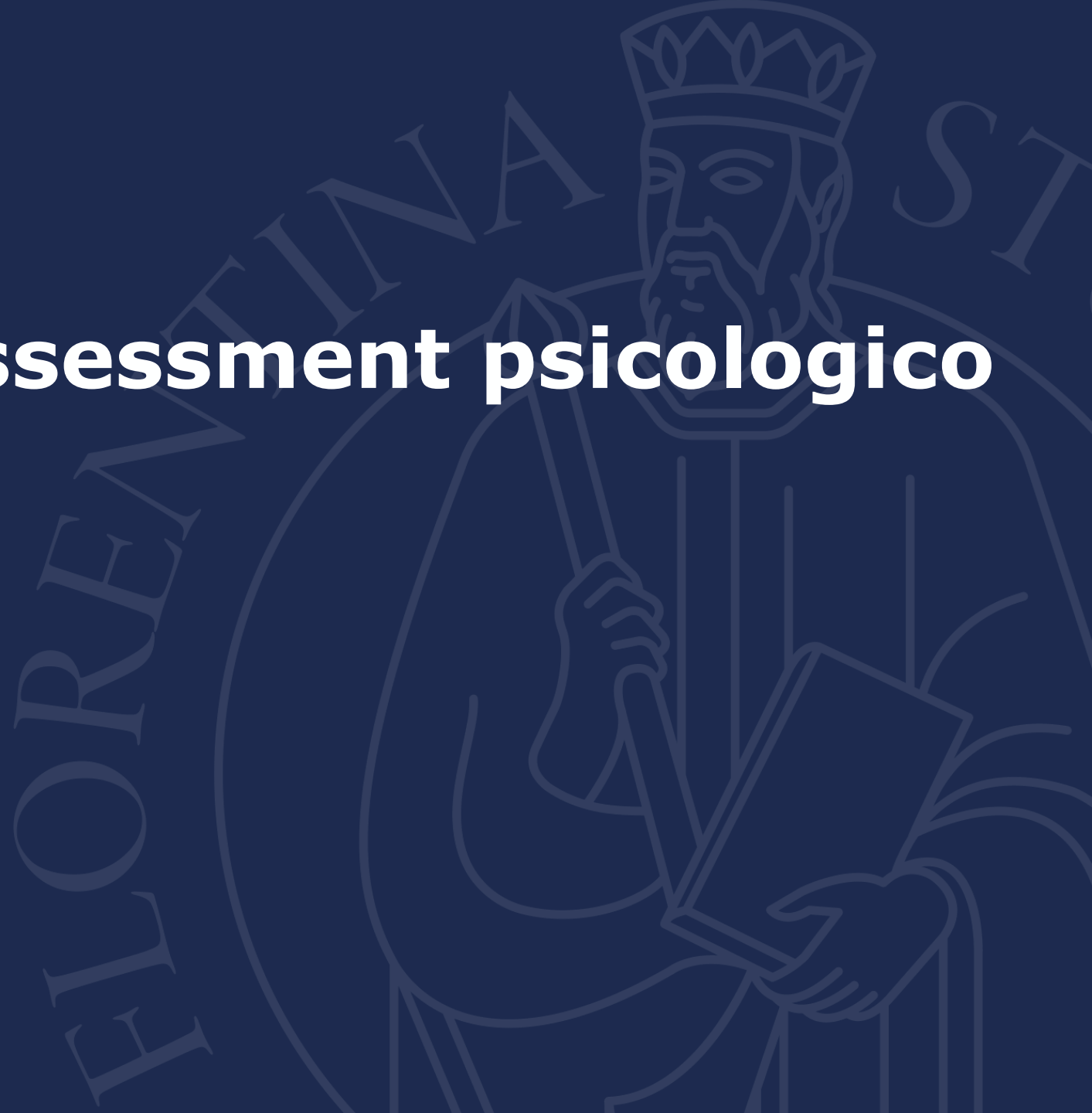
- Occorre stabilire una regola che permetta di mettere in corrispondenza il **sistema relazionale dei numeri** ed il **sistema empirico**, in modo da mettere in relazione certe **proprietà delle unità di analisi** con le **proprietà dei numeri reali** e *agire quindi su questi ultimi come se si agisse sui primi*
- Costruire una funzione che conserva la forma della relazione del **Sistema Empirico** nel **Sistema Numerico** (**OMOMORFISMO**)

Luccio, 2005

- Il risultato di questa corrispondenza è la **SCALA DI MISURA** della variabile:
 - la scala deriva dal fatto di aver individuato delle condizioni affinché ***il SE sia ben rappresentato, mediante omomorfismo, dal SN***
- In base alle *diverse proprietà dei numeri*, esistono *diversi livelli di misurazione* ovvero *diverse scale di misura* (Stevens, 1951)

Chiesi & Primi, 2002

#Assessment psicologico



- **Misurazione sistematica che comprende obiettivi e strategie di misurazione e le inferenze derivabili dalle misure ottenute**
- Insieme di metodi e procedure di **valutazione** che permettono di descrivere e spiegare la condizione psicologica dell'individuo/del gruppo, fare diagnosi e fornire **supporto alle decisioni** che l'* psicolog* deve prendere in merito a quella persona/quel gruppo
- **Processo articolato** basato sull'integrazione di informazioni provenienti da **varie fonti e strumenti**

- **Vari metodi:**
 - Osservazioni comportamentali
 - Colloquio psicologico
 - Test psicologici self-report
 - Test psicologici etero-valutativi
 - Interviste
 - Checklist
 - Rilevazioni fisiologiche
 - Performance a task comportamentali
 - Misura gamificate
 - Contesti immersivi della misurazione (virtual reality)

- «...An **objective and standardized measure** of a sample of behaviors» (Anastasi, 1982)
- «...Una **situazione standardizzata** nella quale il comportamento di una persona viene campionato, osservato e descritto producendo una **misura oggettiva e standardizzata** di un campione di comportamento» (Boncori, 1993)

○ **Standardizzati**

- Stimoli (item) uguali per tutti, presentati nello stesso ordine e selezionati in base a dei criteri
- Da somministrare in setting standardizzati e con istruzioni standardizzate
- Le risposte sono valutate in modo oggettivo e sono elaborate delle regole precise per la quantificazione dei risultati (*scaling psicometrico*)
- Condizioni ambientali standardizzate così come la somministrazione e il ruolo e le funzioni del somministratore

- Producono una misura **oggettiva** di un comportamento
- L'attribuzione e l'interpretazione dei punteggi ai test deve presupporre criteri quantitativi **indipendenti dal giudizio del valutatore**
- Producono **conoscenza** scientifica (pubblica e replicabile), **NON conoscenza intuitiva/comune (asistematica e spesso inconsapevole)**

- Per essere uno **strumento di misura utile per la ricerca su grandi campioni**, un test deve soddisfare le seguenti **proprietà psicometriche**:

- **Attendibilità**
- **Validità**

- Per essere uno **strumento di misura utile per profilare singole persone**, un test deve soddisfare le seguenti **proprietà psicometriche**:

- **Attendibilità**
- **Validità**
- **Standardizzazione**

- **Attendibilità**

- **Precisione** con cui un test misura una certa caratteristica, facendo fronte all'***errore di misurazione***

- ***Coerenza interna***

- ***Stabilità temporale***

- **Validità**

- **Accuratezza** della misura: una misura è valida quando misura ciò che intende misurare

- Di costrutto: convergente, discriminante

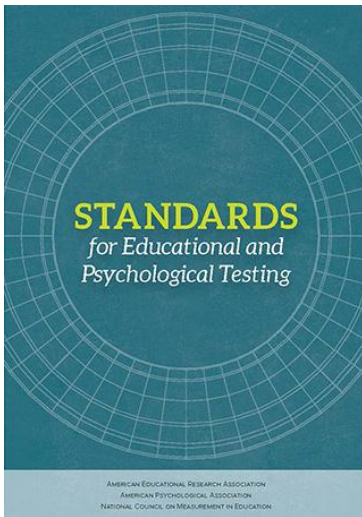
- Di criterio: concorrente, predittiva

- Nomologica

- **Attendibilità e Validità**
 - L'attendibilità è **un requisito necessario ma non sufficiente per la validità**: se una misura non è attendibile, non può essere valida; se una misura è attendibile, non è detto che sia valida
 - L'attendibilità può essere indipendente dalla validità: uno strumento può produrre misure precise ma non supportate a livello teorico

- **Standardizzazione (Taratura)**
 - Processo che porta a poter ricavare un **punteggio normativo** dalla somministrazione di un test
 - Punteggio normativo: serve a dare significato al punteggio che ***una persona*** ottiene ad un test, confrontando **il suo punteggio/la sua posizione** con i punteggi/posizioni del suo gruppo di riferimento (**campione normativo**)

- **Standardizzazione (Taratura)**
 - Il risultato ad un test psicologico assume ***significato per la persona*** solamente:
 - In relazione ad un punteggio di riferimento del suo specifico gruppo (sesso, età)
 - Quando siano note le caratteristiche della distribuzione dei punteggi del suo specifico gruppo (sesso, età)



- American Psychological Association (APA)
- American Educational Research Association (AERA)
- National Council on Measurement in Education (NCME)



- Gruppo di associazioni psicologiche, commissioni, case editrici ed altre organizzazioni che si impegnano a promuovere **politiche di testing ed assessment adeguate ed un uso appropriato dei test in ambito psicologico ed educativo**

- La caratteristica misurata è detta **costrutto**
 - Concetto ***astratto*** che indica un aspetto della vita psicologica, non osservabile direttamente, ma ***inferito da una serie di indicatori empirici osservabili***
- Proprietà del **costrutto**:
 - Caratteristica rispetto alla quale gli individui differiscono
 - Collocato in un modello teorico di riferimento
 - Definito in modo operativo
 - Indicatori

- Proprietà degli **indicatori**:
 - ***Variabile empirica osservabile*** che indica, appunto, il costrutto non osservabile, tramite una regola di corrispondenza:
 - Indicatore  Item del test psicologico

- Proprietà degli **item**:
 - ***Elemento minimale*** del test psicologico
 - Formato assertivo o a quesito
 - Diversi formati di risposta (dicotomico, politomico)
 - Risposte agli item combinate (somma o media) per ottenere un punteggio complessivo al test

- Proprietà del **punteggio complessivo al test**:
 - ***Combinazione statistico/psicometrica delle variabile empiriche osservabili*** che indica, appunto, il costrutto non osservabile, tramite una regola di corrispondenza:
 - Costrutto  Punteggio complessivo al test psicologico

#Gioco d'azzardo problematico



Su cosa interrogarci in base allo scopo

- Costrutto misurato
 - Modello teorico di riferimento e indicatori
 - Fraseggio (Traduzione)
 - Adeguatezza al target
- Scala di misura
 - Scala di risposta
 - Periodo di riferimento
- Proprietà psicometriche verificate in relazione all'uso che se ne vuol fare
 - Nella versione originale e in quella italiana
 - Nel target di riferimento

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BRIEF REPORT

The Suitability of the South Oaks Gambling Screen–Revised for
Adolescents (SOGS-RA) as a Screening Tool: IRT-Based Evidence

Francesca Chiesi, Maria Anna Donati, Silvia Galli, and Caterina Primi
University of Florence

The South Oaks Gambling Screen–Revised for Adolescents (SOGS-RA) is one of the most widely used measures of adolescent gambling. We aimed to provide evidence of its suitability as a screening tool applying item response theory (IRT). The scale was administered to 981 adolescents (64% males; mean age = 16.57 years, $SD = 1.63$ years) attending high school. Analyses were carried out with a sample of 871 respondents, that is, adolescents who have gambled at least once during the previous year. Once the prerequisite of unidimensionality was confirmed through confirmatory factor analysis, unidimensional IRT analyses were performed. The 2-parameter logistic model was used in order to estimate item parameters (severity and discrimination) and the test information function. Results showed that item severity ranged from medium to high, and most of the items showed large discrimination parameters, indicating that the scale accurately measures medium to high levels of problem gambling. These regions of the trait were associated with the greatest amount of information, indicating that the SOGS-RA provides a reliable measure for identifying both problem gamblers and adolescents at risk of developing maladaptive behaviors deriving from gambling. The IRT-based evidence supports the suitability of the SOGS-RA as a screening tool in adolescent populations.

Keywords: gambling, adolescents, screening, SOGS-RA, item response theory

Large-scale international prevalence studies have revealed that between 66% and 86% of youth reported gambling in the past year (Hardoon, Gupta, & Derevensky, 2004), and although there is a lack of consensus as to the actual adolescent prevalence of severe gambling problems, there is a general agreement on the fact that a high proportion of adolescents gamble excessively and that, as a group, adolescents constitute a high-risk population for developing gambling problems (Derevensky & Gupta, 2006; Jacobs, 2004).

Due to the societal importance of the phenomenon, much attention has been paid to the issue of measurement of youth gambling problems (for reviews, see Derevensky & Gupta, 2004, 2006), and there is a debate about the efficiency of the most commonly employed adolescent gambling screens, such as the South Oaks Gambling Screen–Revised for Adolescents (SOGS-RA; Winters, Stinchfield, & Fulkerson, 1993); the Massachusetts Adolescent

instruments, modifying some items to make them more age appropriate. These items focus on the behavioral indicators of problem gambling (lying, chasing), the emotional and psychological correlates of pathological gambling (withdrawal, guilt, preoccupation, loss of control), the adverse consequences of excessive gaming (illegal acts, school or work problems), and the economic and social problems directly associated with gambling (excessive losses, family problems).

Among these measures, the SOGS-RA (Winters et al., 1993), despite its widespread use (for a recent review, see Blinn-Pike, Worthy, & Jonkman, 2010), has been criticized for overdiagnosing problem gambling compared with other popular adolescent gambling severity measures. Comparison studies between the SOGS-RA, the MAGS, and the *DSM-IV-J* have indicated that the SOGS-RA may provide overly liberal estimates of problem gam-



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Test

Bambini e adolescenti ×

Dipendenze ×

Filtro

Acronimo del test



GBS-A Gambling Behavior Scale for Adolescents

di Caterina Primi, Maria Anna
Donati, Francesca Chiesi

2015

Disponibile come:

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ORIGINAL RESEARCH
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Gender Invariance of the *Gambling Behavior Scale for Adolescents* (GBS-A): An Analysis of Differential Item Functioning Using Item Response Theory

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As there is a lack of evidence attesting the equivalent item functioning across genders for the most employed instruments used to measure pathological gambling in adolescence, the present study was aimed to test the gender invariance of the *Gambling Behavior Scale for Adolescents* (GBS-A), a new measurement tool to assess the severity of Gambling Disorder (GD) in adolescents. The equivalence of the items across genders was assessed by analyzing Differential Item Functioning within an Item Response Theory framework. The GBS-A was administered to 1,723 adolescents, and the graded response model was employed. The results attested the measurement equivalence of the GBS-A when administered to male and female adolescent gamblers. Overall, findings provided evidence that the GBS-A is an effective measurement tool of the severity of GD in male and female adolescents and that the scale was unbiased and able to relieve truly gender differences. As such, the GBS-A can be profitably used in educational interventions and clinical treatments with young people.

Keywords: gambling disorder, adolescents, gender invariance, differential item functioning, item response theory

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INTRODUCTION

International studies found gender differences in gambling problem severity among adolescents, indicating that boys are more likely than girls to report gambling problems (see Splevins et al., 2010; Calado et al., 2017, for reviews). Gender differences have been evidenced with different-aged samples belonging to various cultural contexts and by using different measurement tools (e.g., Delfabbro et al., 2009; Molde et al., 2009; Donati et al., 2013; Gupta et al., 2013). These instruments include the most employed scales used internationally, such as the *South Oaks Gambling Screen-Revised for Adolescents* (SOGS-RA; Winters et al., 1993), the *Diagnostic and Statistical Manual—Fourth Edition* [DSM-IV; American Psychiatric Association (APA), 1994], *Adapted for Juveniles* (DSM-IV-J; Fergusson, 2003), and the *Modified Adolescent Gambling Screen* (MAGS; DSM-IV-J; Fergusson, 2003).

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Addictive Behaviors



Psychometric properties of the Gambling Related Cognitions Scale (GRCS) in young Italian gamblers



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HIGHLIGHTS

- The GRCS psychometric properties in an Italian youth sample have been analyzed.
- The GRCS factor structure in male and female adolescent gamblers has been verified.
- We further analyze the validity of the GRCS among young gamblers.
- The GRCS has good psychometric properties in Italian young gamblers.

ARTICLE INFO

Available online 14 January 2015

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Gambling-related cognitions
Cognitive distortions
Adolescents
Validity

ABSTRACT

Introduction: The involvement in gambling activities is increasing among adolescents, together with the risk of developing gambling problems. Given the important role of erroneous beliefs on adolescent problematic gambling behavior, the aim of this study was to investigate the adequacy of the Gambling Related Cognitions Scale (GRCS; Raylu & Oei, 2004) to assess gambling-related distortions among youth in Italy.

Methods: The scale was administered to 1656 Italian high school students (65% males, mean age = 16.15 years, SD = 1.44), and analyses were carried out with respondents who have gambled during the previous year (N = 1224).

Results: The adequacy of the five-factor model was confirmed (both among male and female adolescent gamblers), as well as the reliability of the total scale and subscales. Evidence for the validity of the GRCS among adolescents was provided confirming the relationship between gambling-related cognitions and problem gambling found in previous studies. Research on the validity of the scale was also extended by investigating the relationship between cognitive distortions about gambling and the frequency of engaging in different gambling activities.

Conclusions: Our results confirm that the GRCS is an effective multidimensional instrument which accurately measures young gamblers' cognitive distortions relating to gambling. As such, it can be used as a useful tool in the assessment and treatment of juvenile gambling.

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1. Introduction

A large number of adolescents are involved in gambling and a high proportion of them develop gambling-related problems (see Volberg, Gupta, Griffiths, Olason, & Delfabbro, 2010, for a review). Maladaptive beliefs on gambling have been identified as risk factors of problem gambling (e.g., Delfabbro, Lambos, King, & Puglies, 2009). Indeed, adolescent problem gamblers have been found to hold erroneous beliefs about

gambling outcomes (e.g., Turner, Zangeneh, & Littman-Sharp, 2006). Specifically, they have cognitive biases such as the perception of gambling as an activity involving a considerable element of skill (e.g., Gupta & Derevensky, 1998), and the belief that they can exercise control over the slot machines they play (Carroll & Huxley, 1994).

Given the importance of gambling-related cognitive biases, some attention has been paid to the issue of measurement (see Goodie & Fortune, 2013 for a review). One of the most recently developed assess-



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Research paper

How can we measure gambling craving among adolescent gamblers? Psychometric properties of the *Gambling Craving Scale*

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ABSTRACT

Background: Craving plays an important role in behavioural addictions such as Gambling Disorder (GD). However, it has only been included as a diagnostic criterion for substance addiction. Moreover, research on craving has focused mainly on adults, leaving out adolescents who can also be heavily involved in gambling behaviour. The purpose of this study was to investigate the psychometric properties of the most widely used craving assessment scale, the *Gambling Craving Scale* (GACS), in adolescent gamblers.

Method: For the current study, 1246 adolescent gamblers attending secondary school were recruited to complete a self-report questionnaire online. The psychometric properties of the GACS were examined: Confirmatory factor analysis was conducted; reliability was examined using the internal consistency method; in terms of validity, the relationship between the GACS total and subscale scores with some risk factors for problem gambling, gambling frequency and gambling problem severity was analyzed.

Results: The factor analysis supported the three-factor structure, and good internal consistency was found for the GACS total scale and its three subscales. As regards validity, the GACS subscales resulted to be significantly and positively associated with economic perception of gambling and outcome expectancy, gambling-related cognitive distortions, gambling frequency, and problem gambling.

Limitations: The findings of this study were based on self-report data and only criterion validity was analyzed.

Conclusions: The GACS is a valid and rapid self-report measure of gambling craving in adolescent gamblers. In terms of prevention, the multidimensionality of the GACS is important for interventions. Clinical samples of adolescents are needed to confirm the validity of the scale.

1. Introduction

Gambling Disorder (GD) is defined as a persistent and recurrent problematic gambling behaviour leading to clinically significant impairment or distress in the latest version of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5; American Psychiatric Association, 2013) and in the recently published eleventh *International Classification of Diseases* (World Health Organization, 2018). In both the classification systems, GD has been included as a non-substance addictive disorder, as a large body of evidence highlighted important similarities between substance-related disorders and non-substance related

dimension of relief from negative feelings as a consequence of the use of the substance/action of the behaviour, and the dimension of anticipation, that is, the intention to use the substance/to do a certain behaviour with the expectation that it will elicit positive affect states such as gratification and pleasure (Brand and Potenza, 2021; Cornil et al., 2018; Young and Wohl, 2009). In recent decades, it has become widely accepted that craving plays a fundamental role also in behavioural addictions (Hasin et al., 2013; Tiffany and Wray, 2012). Nevertheless, craving has been included as a diagnostic criterion only for substance use addictions and not for the diagnosis of GD (DSM-5; APA, 2013).

This is very surprising as craving plays a fundamental role in the



International Gambling Studies



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Measuring the pathways model through the *gambling pathways questionnaire*: the psychometric properties of the Italian version

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Alter Game: A Study Protocol on a Virtual “Serious Game” for Relapse Prevention in Patients With Gambling Disorder

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Cognitive behavioral therapy (CBT) is the most successful protocol in gambling disorder (GD) treatment. However, it presents some weaknesses, especially concerning relapse prevention (RP). RP is one of the most important therapeutic steps, aiming at managing cravings and to avoid future relapse increasing perceived self-efficacy. Encouraging results come from the blending of psychotherapy and virtual reality (VR), containing gambling cues. The goal of *Alter Game* (approved by the Ethical Commission, Prot. No. 69346) is verifying the efficacy of an innovative psychological treatment for GD based on the integration of traditional CBT therapy and an immersive VR cue exposure therapy using a serious virtual game, which is a game designed for purposes other than entertainment. RP in virtual cue-exposure therapy allows pathological gamblers to manage the urge to gamble and to avoid relapse by becoming aware of which internal and external triggers are related to craving. We hypothesize that the integrated intervention will be more effective than simple CBT with regard to self-efficacy, craving, and gambling-related distortions. Four virtual ecological environments were developed, and a virtual app, *Excludo*, interfaced with a computerized multiparametric acquisition system for biofeedback, was created. A sample of about 60 patients aged between 18 and 65 with GD referring to the Addiction Medicine Unit of Verona (Rossi Hospital) will be recruited. Patients will be randomly assigned to the CBT group (16 CBT sessions) or the CBT + VR group (8 CBT sessions + 8 VR cue-exposure therapy sessions). The MCMI-III, the BIS-11, and the SOGS will be used to evaluate inclusion and exclusion criteria, while the *Gambling Related Cognitions Scale* and the *Multidimensional Gambling Self-Efficacy Scale* will be used to verify changes as a function of the treatment. Craving will be evaluated through VAS, and psychophysiological variables will be assessed through biofeedback. A pre-test/post-test experimental design with a 1-month follow-up will be conducted. This study will examine an innovative psychotherapeutic protocol for GD treatment, and it will help in identifying new virtual tools to increase the efficacy of traditional therapeutic approaches that could also be applied to treat other addictions.

Keywords: gambling disorder, virtual cue-exposure therapy, serious game, relapse prevention, craving



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SAFESLOT: an experimental virtual reality protocol to examine flow, craving, and cognitive biases in gambling

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Gambling-related harm comes out from dynamic interactions between craving, cognitive distortions, and physiological responses to gambling outcomes. These processes happen rapidly during play and are strongly influenced by the structural features of slot machine, yet they are seldom captured in real time using ecologically valid methods. Traditional research has relied mainly on self-report measures and simplified gambling simulations, limiting the ability to assess moment-to-moment changes in motivation, cognition, and arousal. The present study aims to address these limitations by developing SAFESLOT: a virtual slot machine designed *ad hoc* to examine behavioral and psychophysiological mechanisms underlying gambling disorder risk and to test whether interrupting gambling activity can attenuate craving and cognitive distortions. The study will recruit approximately 200 university students who will participate in a controlled virtual reality slot-machine task. The virtual environment replicates a realistic Video Lottery Terminal. The task will be composed by five gameplay sessions, each emphasizing a distinct feature of slot machines. Participants will be randomly assigned to one of three conditions: uninterrupted gambling, gambling interrupted by brief reflective pauses with questions concerning craving and perceived winning probability, and gambling interrupted without self-reflective prompts. During the task, continuous multimodal data will be collected, including psychophysiological signals, behavioral indicators such as reaction times, betting patterns, and eye-tracking measures. Psychological self-report assessments will be administered before and after the virtual gambling experience. Data analysis will combine classical statistical methods with machine learning techniques in order to identify patterns associated with changes in craving and gambling-related cognitive distortions. Our study aims to clarify how specific gambling



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Grazie!

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