Item Response Theory (IRT) analyses of DSM-5 criteria for internet gaming disorder adapted to electronic screen use disorder.
An exploratory survey in a suburban community sample

M. Boudard[1,2,3#], J-M. Alexandre[1,2,3#], C. Kervran[1,2,3#], L. Jakubiec[1,2,3], D. Schmulewitz[6,7], D. Hasin[6,7], L. Fournet[1,2,3], C. Rassis[2,3], P. Claverie[5], F. Serre[1,2,3], M. Auriacombe[1,2,3,4]

1 University of Bordeaux, F-33000 Bordeaux, France
2 SANPSY Laboratory, CNRS USR 3413, F-33000 Bordeaux, France
3 Pôle InterEtablissement d'Addictologie, CH Ch. Perrens and CHU de Bordeaux, F-33076 Bordeaux, France
4 Center for Studies of Addiction, Department of Psychiatry, Perelman School of Medicine, University of Pennsylvania, PA, 19104, USA
5 CLSPD de Martignas-sur-Jalles, F-33127 Martignas-sur-Jalles, France
6 New York State Psychiatric Institute, 1051 Riverside Drive, New York, NY, 10032, USA
7 Department of Psychiatry, Columbia University Medical Center, 1051 Riverside Drive, New York, NY, 10032, USA
# These authors contributed equally

INTRODUCTION

- Screen addiction: not currently recognized as a disorder in diagnostic nomenclatures (DSM, CIM)
- However, morbidity related to excess use of screens has been reported, thus some use of screens in excess could indicate a « screen use disorder (ScUD) »
- A pragmatic and operationalized approach to study a potential ScUD requires the use of common criteria, for all screens and activities done on screens

Martignas city council: request our lab to survey **local screen use**
– Sub-urban city in Nouvelle-Aquitaine, France (Bordeaux area)
– 7400 inhabitants
→opportunity to conduct a field survey under real-life conditions
With the support of the local community

Martignas sur Jalle location near Bordeaux, France

OBJECTIVES

- To describe screens use in a general population sample
- To test the unidimensionality, local independence, and psychometric properties of DSM-5 internet gaming disorder (IGD) criteria adapted to "screen use disorder" (ScUD)

METHODS

Task force: SANPSY Univ. Bordeaux France, Addiction Clinic CH Ch. Perrens – CHU Bordeaux, Nouvelle-Aquitaine region expert center on pathological Gambling, Martignas city council and population representatives

Cross-sectional survey

Target population: 7400 inhabitants Martignas city, France

Specific questionnaire designed by the task force
Adolescents/adults (≥12 y.o): self-questionnaire (with ScUD)
(Children (<12 y.o): filled by parents, without ScUD → data not shown)
Anonymous, close-ended responses
5-15 minutes to complete. Timeframe: last 12 months
note for presentation of the study and confidentiality

Data collected:
Television, computer, smartphone, tablets, handled game console
Screens use: for each screen, availability, frequencies & time spend, context, activities
ScUD: adaptation of the 9 DSM-5 *Internet Gaming Disorder* criteria

Analysis: – Description of sample and prevalence of ScUD
– Comparison of "*No problematic screen use*" group (No ScUD criteria) vs. "*Potential problematic screen use*" group (≥ 1 ScUD criteria) on screen types and activities on screen
– **Factor & IRT analysis**

RESULTS (1)

Sample
Survey response rate: 33.4%
N=300 adolescents/adults
Mean age=27 y.o. (SD=18.9), 43% Males

99% used any screen on every day
Widespread access and regular use ("*almost every day*") of all types of screens in daily life activities ; Regular users: up to 10 hours/day

Screen use disorder (ScUD)
Prevalence of each criteria ranged from 2% to **18%** ("*unable to cut back*")
All types of screens and activities
Main problems reported: sleep, vision & weightproblems, neglecting important activities, arguments with others

Screen use disorder criteria (cumulative; prevalence in sample)
0 : 55.3% (n=166)
≥ 1 : 44.7% (n=134) ← 1 or more ScUD criteria
≥ 2 : 19.3% (n=58)   "*Potential problem users*"
≥ 3 : 7.7% (n=23)
≥ 4 : 2.3% (n=7)
≥ 5 : 1.7% (n=5) ← proposed threshold for IGD
≥ 6 : 1.0% (n=3)   proposed "*Screen use disorder*"
7 : 0.3% (n=1)

RESULTS (2)

Main screens types and activities
Screen types used and screen activities differed between participants with no ScUD criteria and those with at least one ScUD criterion

Main screen and activity for participants with no ScUD criteria and at least one ScUD criteria. Description of Screen type and activities considered as problematic for participant with at least one ScUD criteria (ScUD: Screen use disorder)

Activities* (several answers possible)	Participants With no ScUD criteria n=166	Participants with one or more ScUD criteria n=134	Univariate analysis P value (Pearson)	Multivariate analysis Adjusted P value (Logistic regression)
Watching news and research of information	97 (58.4%)	91 (67.9%)	0.0916	0.002
Work-related activities	53 (31.9%)	48 (35.8%)	0.4781	NS (0.635)
Others	99 (59.6%)	75 (56.0%)	0.5222	NS (0.749)
Communication/Social network	47 (28.3%)	63 (47.4%)	0.0007	0.029
Video gaming	41 (24.7%)	76 (57.1%)	<0.0001	0.0021
Purchase	15 (9.0%)	15 (11.3%)	0.5214	NS (0.432)
Gambling	8 (4.8%)	5 (3.8%)	0.6552	NS (0.431)
Screen type* (several answers possible)				
TV	103(62.1%)	57 (42.5%)	0.0008	NS (0.062)
Smartphone	55 (33.1%)	60 (44.8%)	0.0392	NS (0.406)
Computer	24 (14.5%)	32 (23.9%)	0.0373	0.004
Tablet	20 (12.1%)	23 (17.2%)	0.2087	NS (0.7309)
Handheld console	7 (4.2%)	11 (8.2%)	0.1478	NS (0.301)

Adjusted on age and gender

Potential problem users (≥ 1 ScUD criteria) :
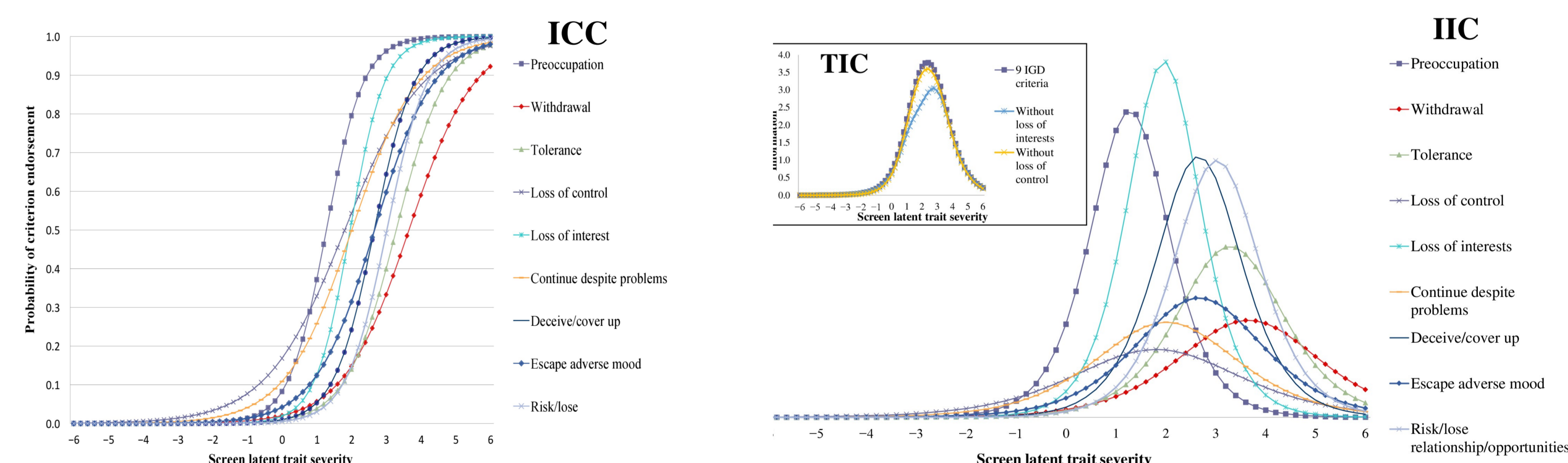– Most used screen type: computer
– Activities: video gaming, communication/social network watching news and research of information

Factor & IRT Analysis
– Unidimensionality and Local independence confirmed by all fit indices
– Criteria had relatively high factor loading
(all > 0.40 ; Max.: *preoccupation* 0.726 & *loss of interest*: 0.779)

Most discriminating criteria were *loss of interests ; Preoccupation ; Deceive/cover up ; Risk/lose relationship or opportunities*

These criteria also provided the most information on the measurement of the latent trait « ScUD »

DISCUSSION

Level of equipment and regular use important for all types of screens, for recreational & work related activities

Important proportion (44.7%) of adolescents & adults with at least 1 positive criteria in past 12-months

Potential problem users (≥ 1 ScUD criteria) reported more computer use and specific activities

"Addiction" was rare (≥5 criteria, **1.7%**)
Diagnosis would remain rare if threshold was lowered to 4 (same as Gambling Disorder)
All criteria needed? / Validity of adding a craving criterion?

ScUD diagnosis criteria: unidimensionality, good psychometric validity, discriminating
→ ScUD could qualify as a disorder, should be investigated further

PARTNERS