Psychological Determinants of Abnormal Nutritional Habits and Obesity
Food Addiction Construct

Susana Jiménez Murcia, PhD
Professor, University Barcelona,
Head of Behavioral Addictions Unit
co-Chair of Group CIBEROBN
Department of Psychiatry
University Hospital of Bellvitge,
Barcelona, SPAIN
e-mail: sjimenez@bellvitgehospital.cat

UNIVERSITAT DE BARCELONA

IDIBELL
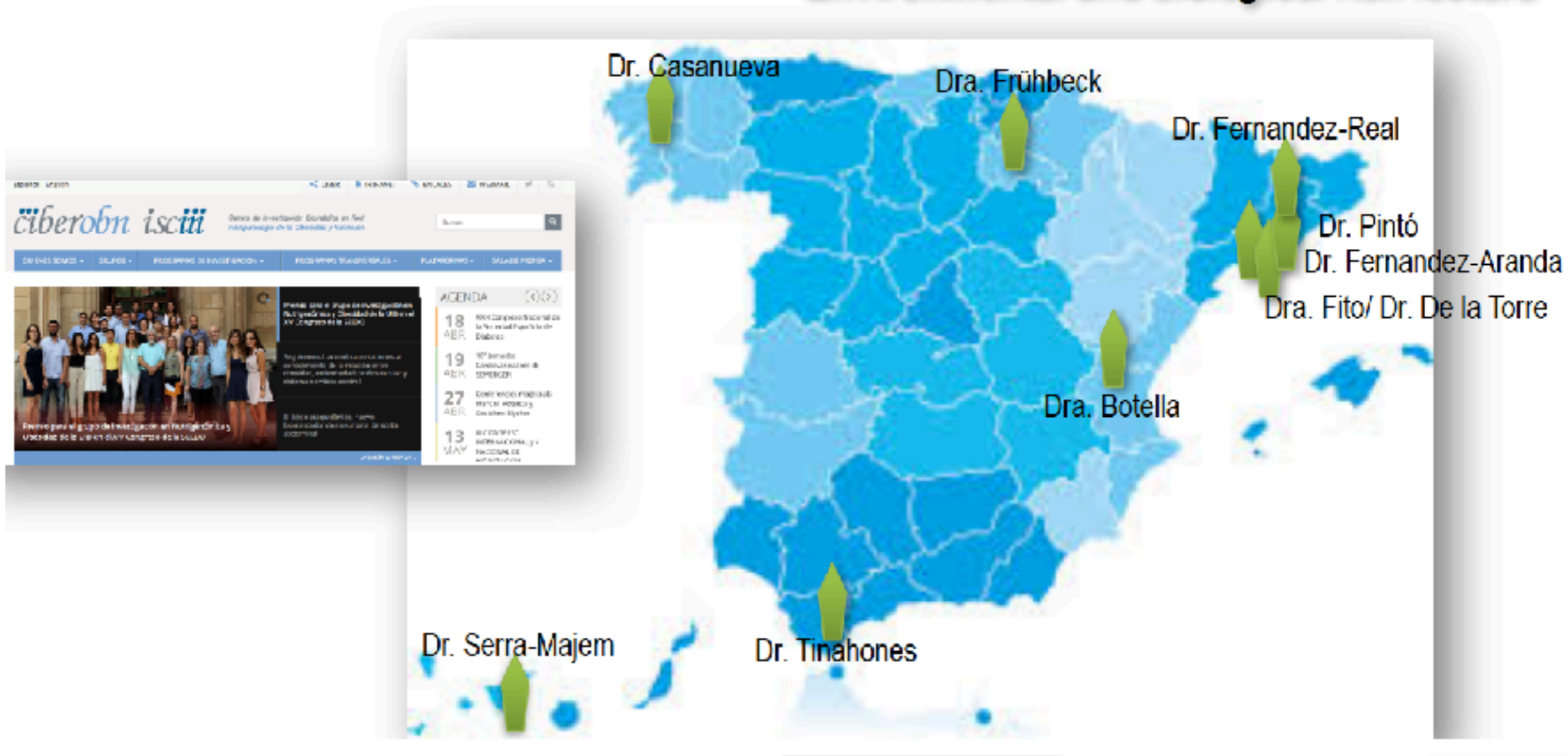Institut d'Investigació Biomèdica de Bellvitge

ciberobn

GOBIERNO DE ESPAÑA
MINISTERIO DE CIENCIA E INNOVACIÓN

Instituto de Salud Carlos III

European Union
European Regional Development Fund

Faculty Disclosures

Obesity

P4-Neurocognition
Environmental and biological risk factors

Food Addiction Topic
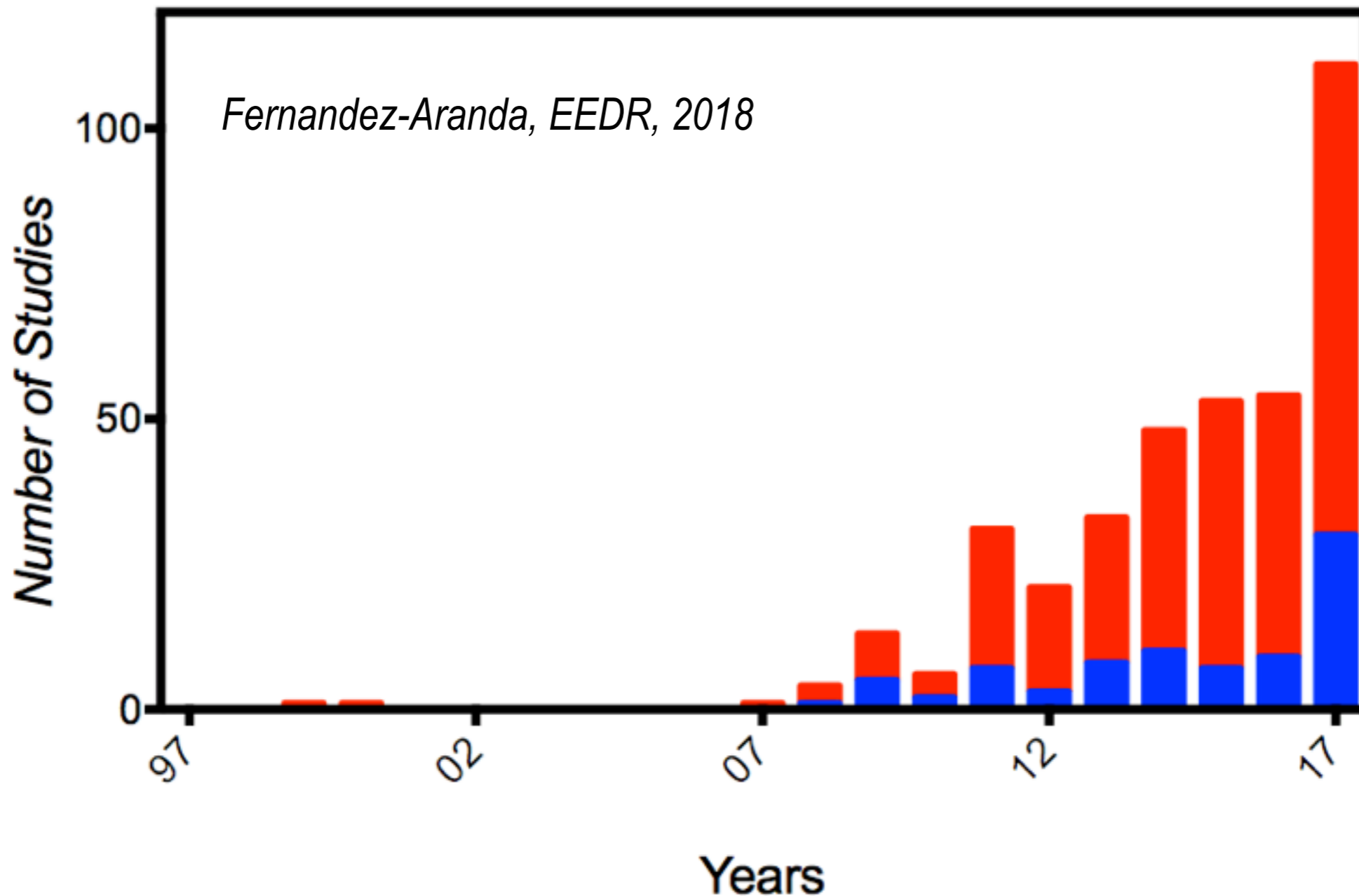*Historical remarks*

Jiménez-Murcia, Dublin, 2019

Food addiction to corn, wheat, coffee, milk, eggs, and potatoes (Randolph, 1956)

Overeaters Anonymous

Addiction-like eating and addictive personality in bulimia (Feldman & Eysenck, 1986; de Silva & Eysenck, 1987)

Chocolate addiction (Bruinsma & Taren, 1999; Hetherington & Macdiarmid, 1993; Tuomisto et al., 1999)

Animal models of sugar and fat bingeing (Avena et al., 2008; Johnson & Kenny, 2010)

1950 1960 1970 1980 1990 2000 2010

"Food addiction" widely used term (Hinkle et al., 1959)

Anorexia as starvation dependence (Szmukler, 1984; Marrazzi & Luby, 1986)

Brain imaging studies in obesity and BED (Wang et al., 2001)

Assessment of food addiction (Gearhardt et al., 2009)

Meule, 2015

Food Addiction Topic
Publications' Trend

Fernandez-Aranda, EEDR, 2018

Obesity and Addictive Processes

Jiménez-Murcia, Dublin, 2019

Transdiagnostic

Obesity

Food Addiction

AN-R

AN-BP

BN/BED

OCD

BDD

Kleptomanía

Other ICDs

Compulsive buying

Gambling Disorder

ADHD

SUD

Compulsive

Impulsive
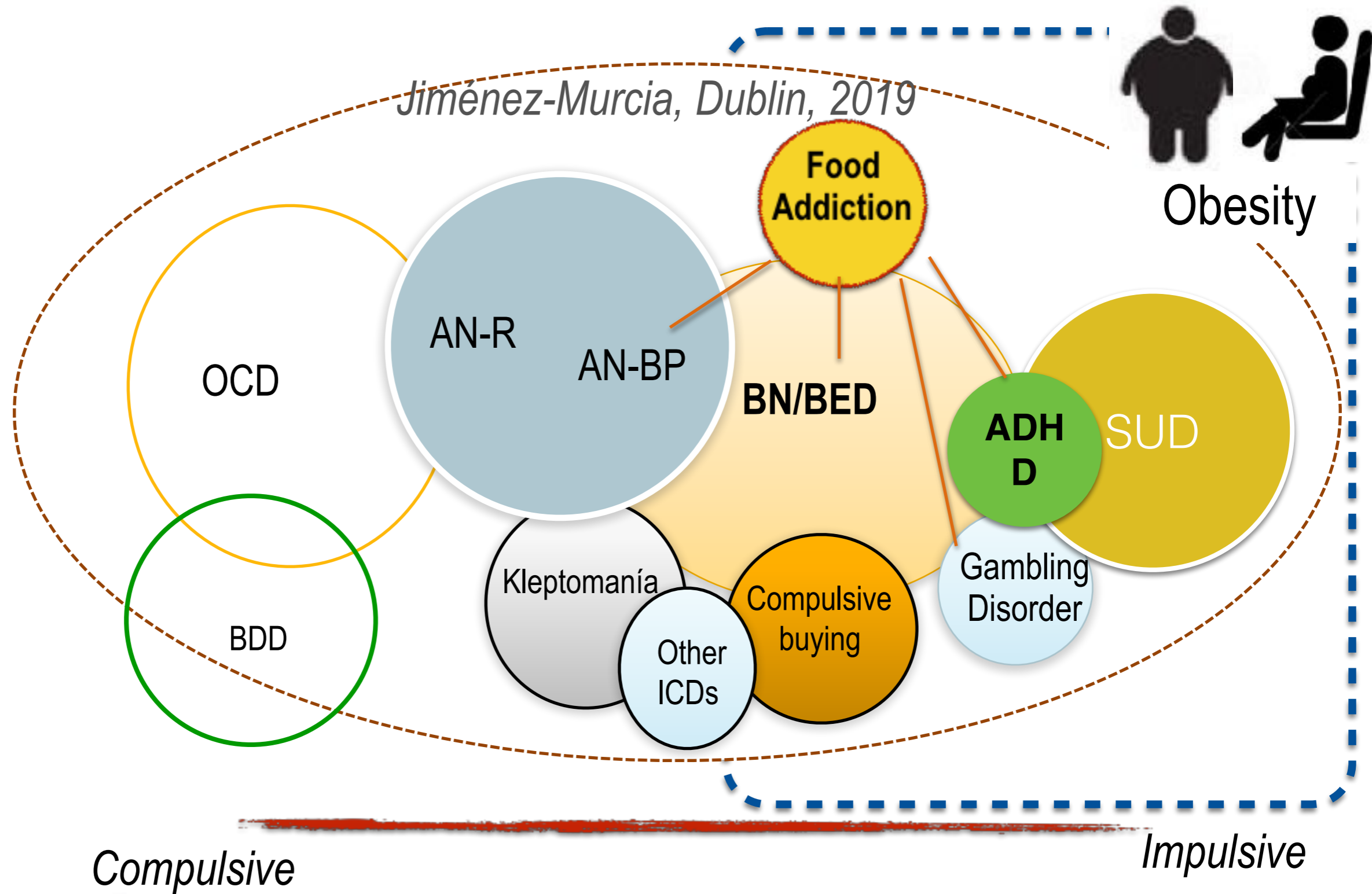
FA transdiagnostic construct

Jiménez-Murcia, Dublin, 2019

OBE
25%

SUD

AN

GD

BED
70%

FA

HC

BN
85%

OSFED
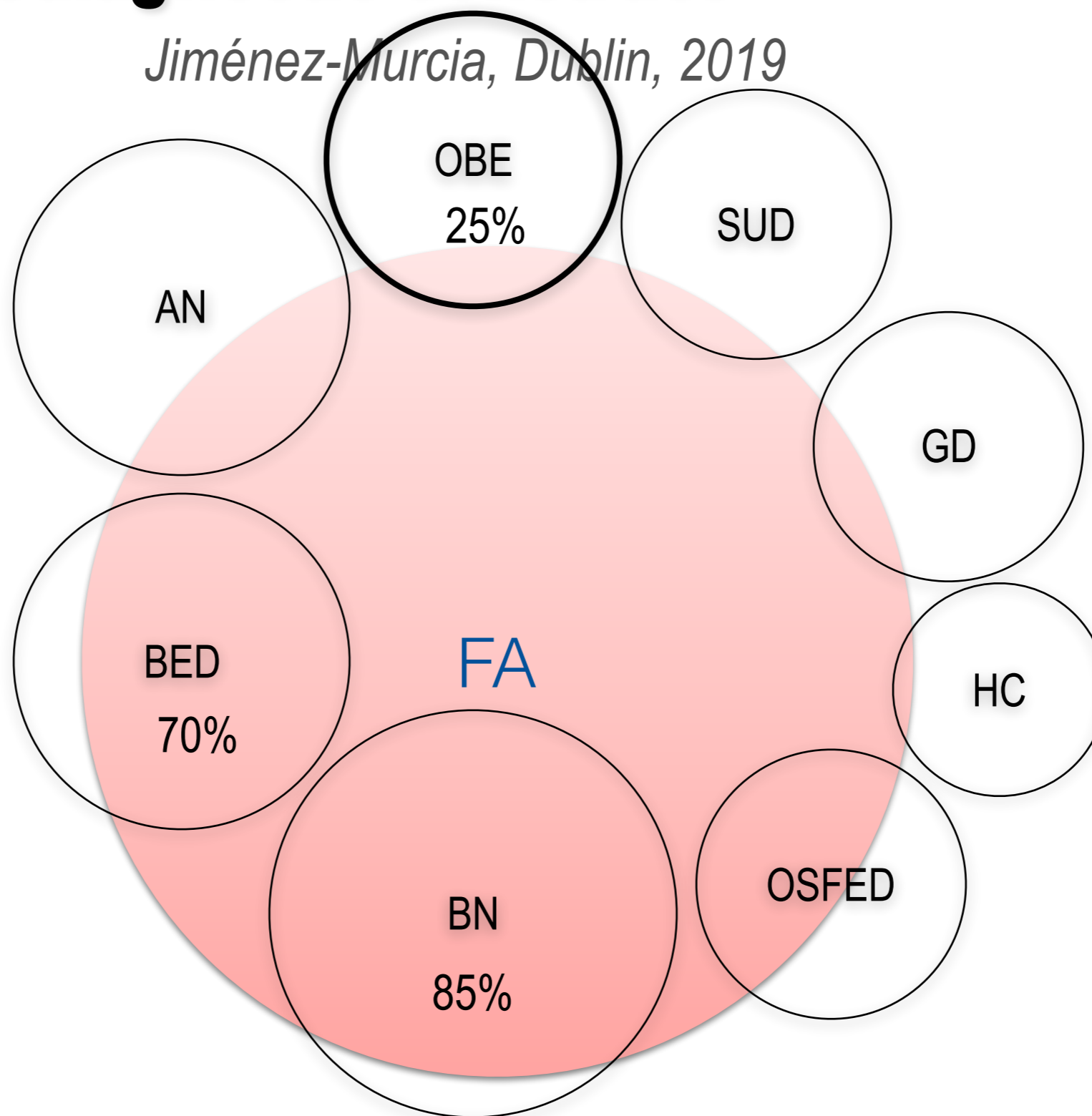
Do we know exactly what we are talking about?

Biopsychosocial model of FA

Food Addiction and ED/Obesity
Current Facts

Jiménez-Murcia, Dublin, 2019

- Neuroimaging studies suggest that similar neuronal circuits, modulated by dopamine, are activated in addiction and obesity.
- YFAS scale is the first validated tool, based on the 7 substance dependence criteria (3 out of 7).
- FA rarely in HC (2-12%) and mainly present in obesity, BN and BED.
- FA associated with higher ED severity and psychopathology.
- FA most likely improves when BN symptoms remit.
- However, food addiction remains a highly controversial and heavily debated issue.

DSM 5 Criteria for Substance Dependence

Jiménez-Murcia, Dublin, 2019

Substance use leading to 3 or more of the following:

1. Tolerance
2. Withdrawal
3. More substance taken than intended
4. Persistent desire or effort to cut down
5. Great deal of time spent acquiring, using or recovering from the effects of substance
6. Important activities given up because of use
7. Continued use despite persistent problems

Food Addiction Construct

Jiménez-Murcia, Dublin, 2019

- FA diagnosis according to a scale (YFAS and YFAS 2.0) based on SUD criteria (DSM-IV and DSM5).
- Collinearity of FA with other well established disorders (e.g. ED).
- FA associated with ED severity, higher psychopathology and BMI.
- Lack of internal validity when considering other abnormal eating patterns (emotional eating, grazing, hyperphagia).
- Lack of biomarkers and biological evidence.

Food Addiction and ED
Current Facts

Jiménez-Murcia, Dublin, 2019
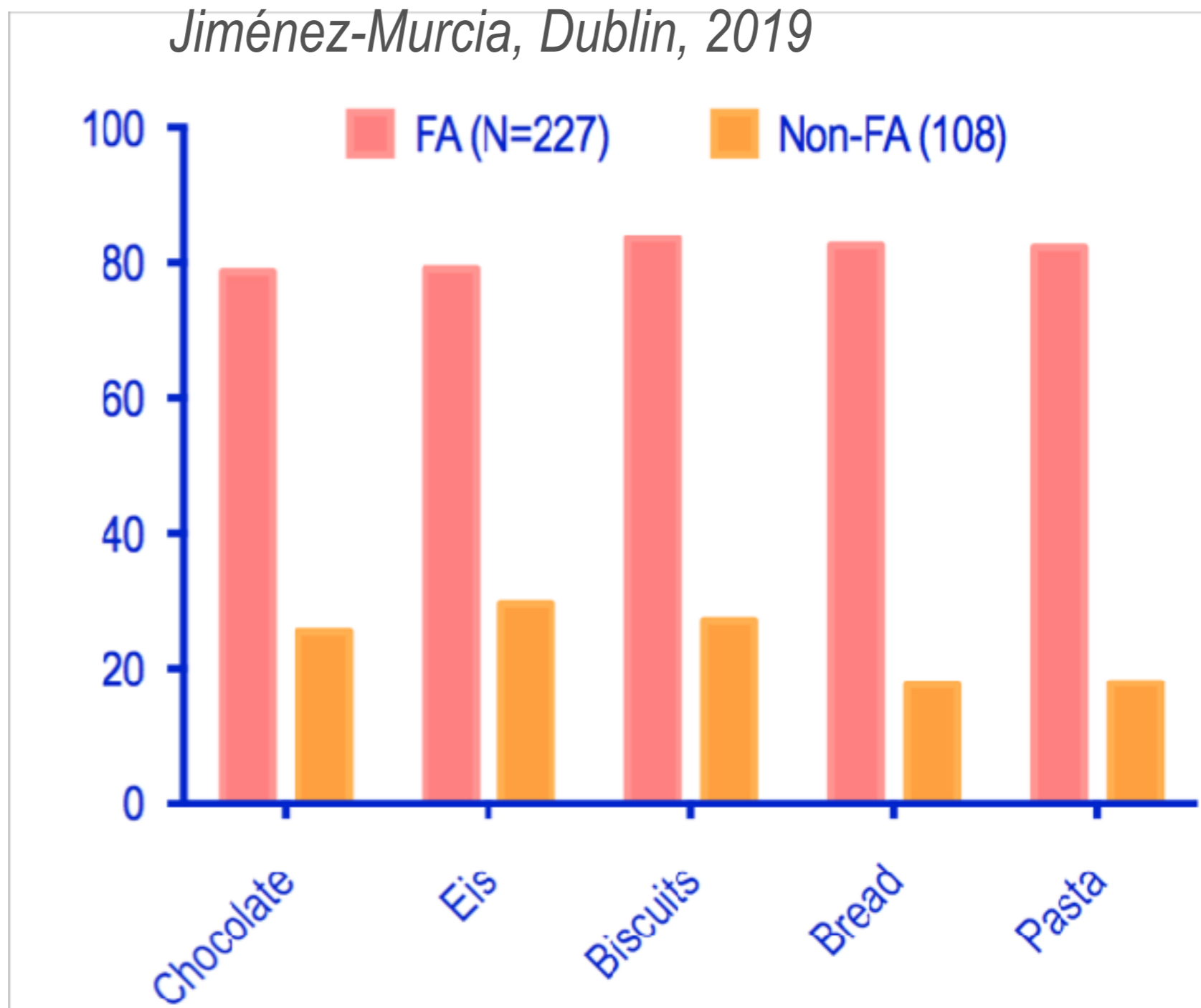
Food Addiction and ED

**Food Addiction in a Spanish Sample of Eating Disorders: DSM-5 Diagnostic Subtype Differentiation and Validation Data**

Roser Granero[1,2+], Ines Hilker[3−], Zaida Agüera[2], Susana Jiménez-Murcia[2,3,4], Sarah Sauchelli[3], Mohammed A. Islam[2], Ana B. Fagundo[2,3], Isabel Sánchez[3], Nadine Riesco[3], Carlos Dieguez[2,5], José Soriano[5], Cristina Salcedo-Sánchez[6], Felipe F. Casanueva[2,7], Rafael De la Torre[2,8], José M. Menchón[3,4,9], Ashley N. Gearhardt[10] & Fernando Fernández-Aranda[2,3,4*]

Granero et al., European Eating disorders Review, 2014; 22-6

40 AN
54 BN
18 EDNOS
13 BED
82 HC
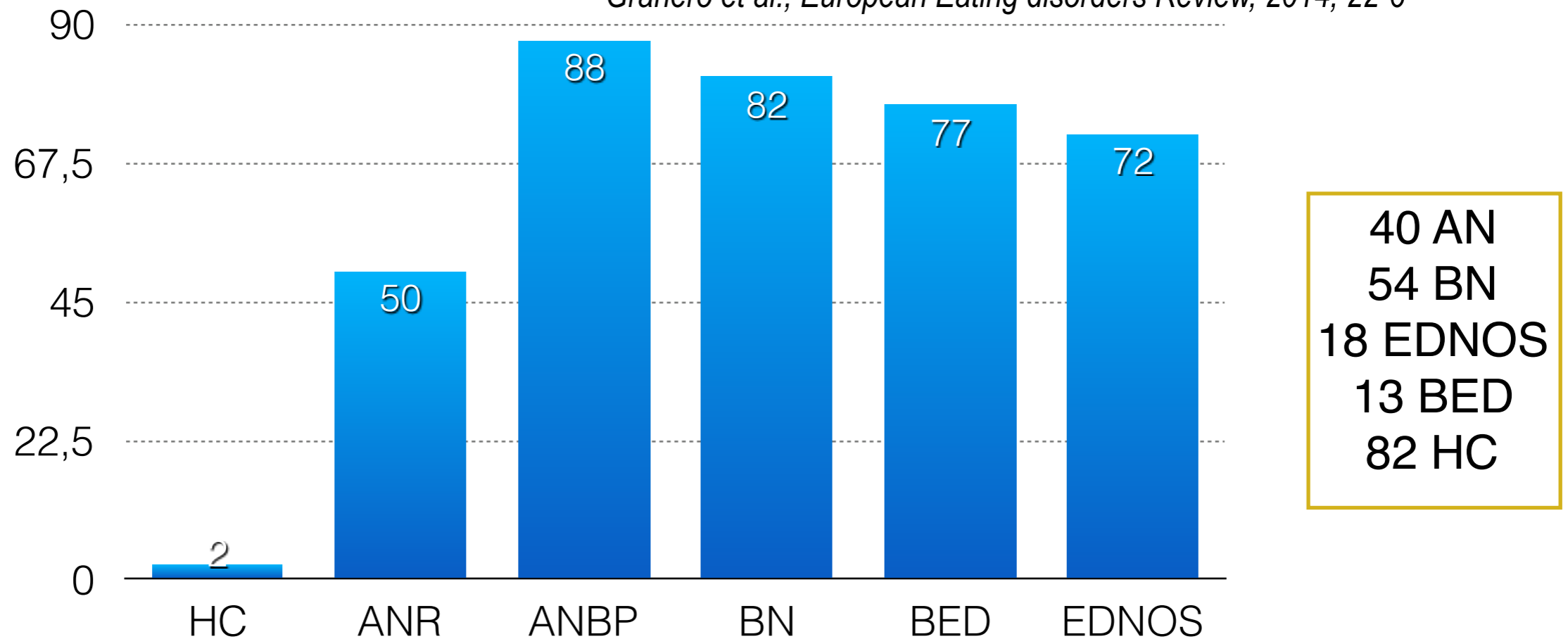
Food Addiction and ED
Personality Traits Associated

| | Adjusted means; SD | | | | ANOVA | | | | |
| | FA=negative | | FA=positive | | (adjusted by age and ED subtype) | | | | |
	n=70		n=208		$F_{df=1;275}$	^1p	eta^2	MD	$\|d\|$
TCI-R: Novelty seeking	100.57	15.07	100.89	15.83	0.02	.915	.000	0.32	0.02
TCI-R: Harm avoidance	113.89	19.54	120.91	21.08	5.24	.080	.019	7.02	0.35
TCI-R: Reward dependence	99.44	16.89	101.82	15.62	0.99	.562	.004	2.38	0.15
TCI-R: Persistence	106.18	18.37	106.52	22.68	0.01	.915	.000	0.34	0.02
TCI-R: Self-directedness	125.03	21.63	115.08	20.46	11.17	**.007**	.040	-9.95	0.47
TCI-R: Cooperativeness	136.71	17.33	134.28	16.24	1.02	.562	.004	-2.43	0.14
TCI-R: Self-Transcendence	63.53	13.28	64.09	14.27	0.07	.915	.000	0.57	0.04
UPPS: lack premeditation	23.58	6.08	23.49	6.24	0.01	.912	.000	-0.10	0.02
UPPS: lack perseverance	21.39	5.45	23.49	5.96	6.22	**.033**	.023	2.10	0.37
UPPS: sensation seeking	26.94	8.01	24.71	8.80	3.41	.110	.013	-2.23	0.26
UPPS: positive UR	26.94	8.79	28.99	8.99	2.34	.159	.009	2.05	0.23
UPPS: negative UR	29.50	6.70	34.20	6.56	24.50	**<.001**	.085	4.70	**0.71***
EDI-2: Total score	80.52	42.94	107.86	42.99	20.24	**<.001**	.069	27.34	**0.64***
SCL-90R: PSDI score	2.04	0.55	2.42	0.58	21.08	**<.001**	.072	0.38	**0.67***

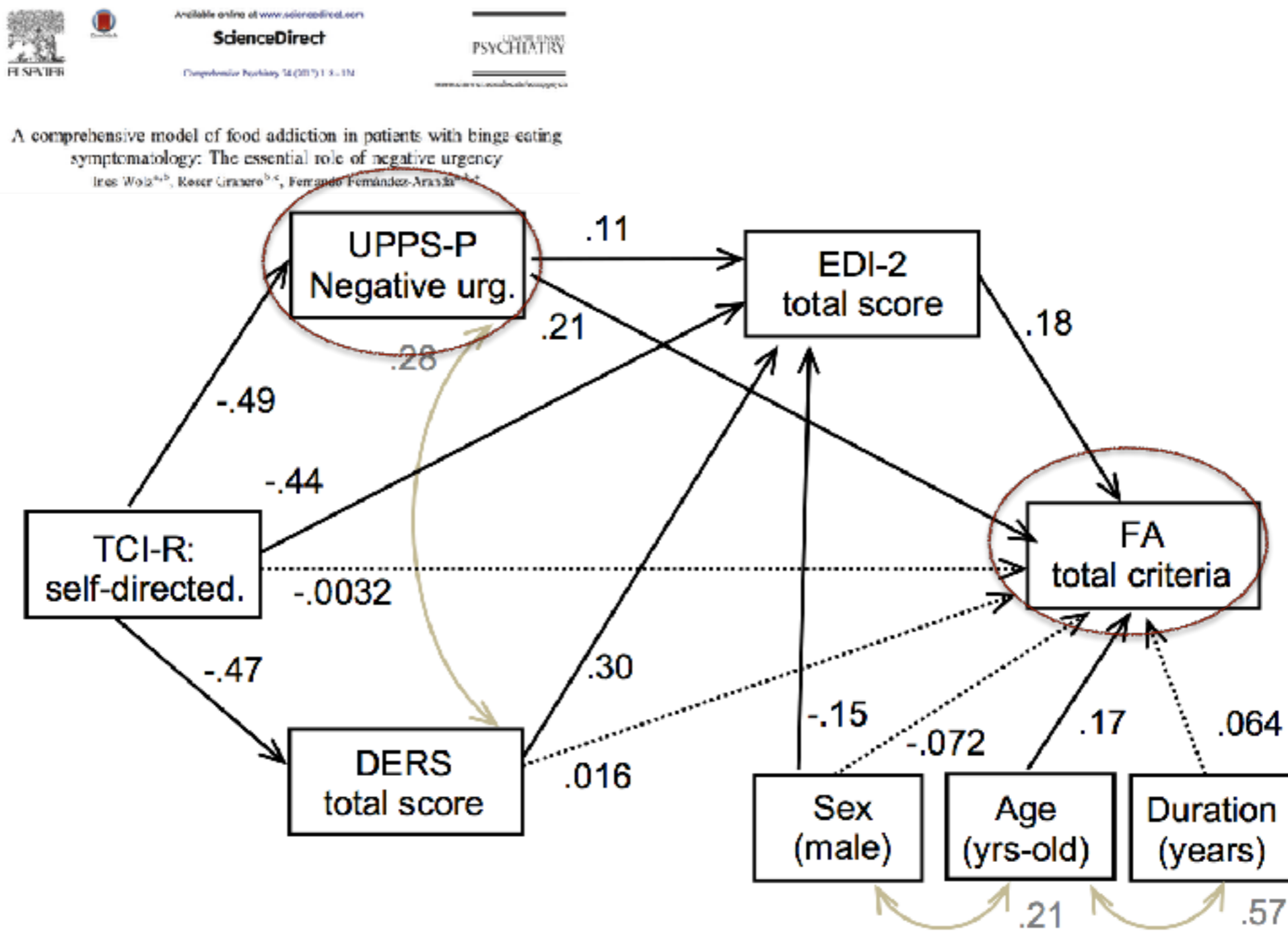FA: food addiction screening. ED: eating disorder. MD: mean difference. *eta^2*: Partial eta^2.

^1p: includes Bonferroni-Finner correction for multiple statistical comparisons.

Bold: significant comparison (.05 level). *Bold: moderate ($|d|$>0.50) to high (($|d|$>0.80) effect size.

Wolz et al.,Frontiers in Psychology, 2016

Food Addiction and ED
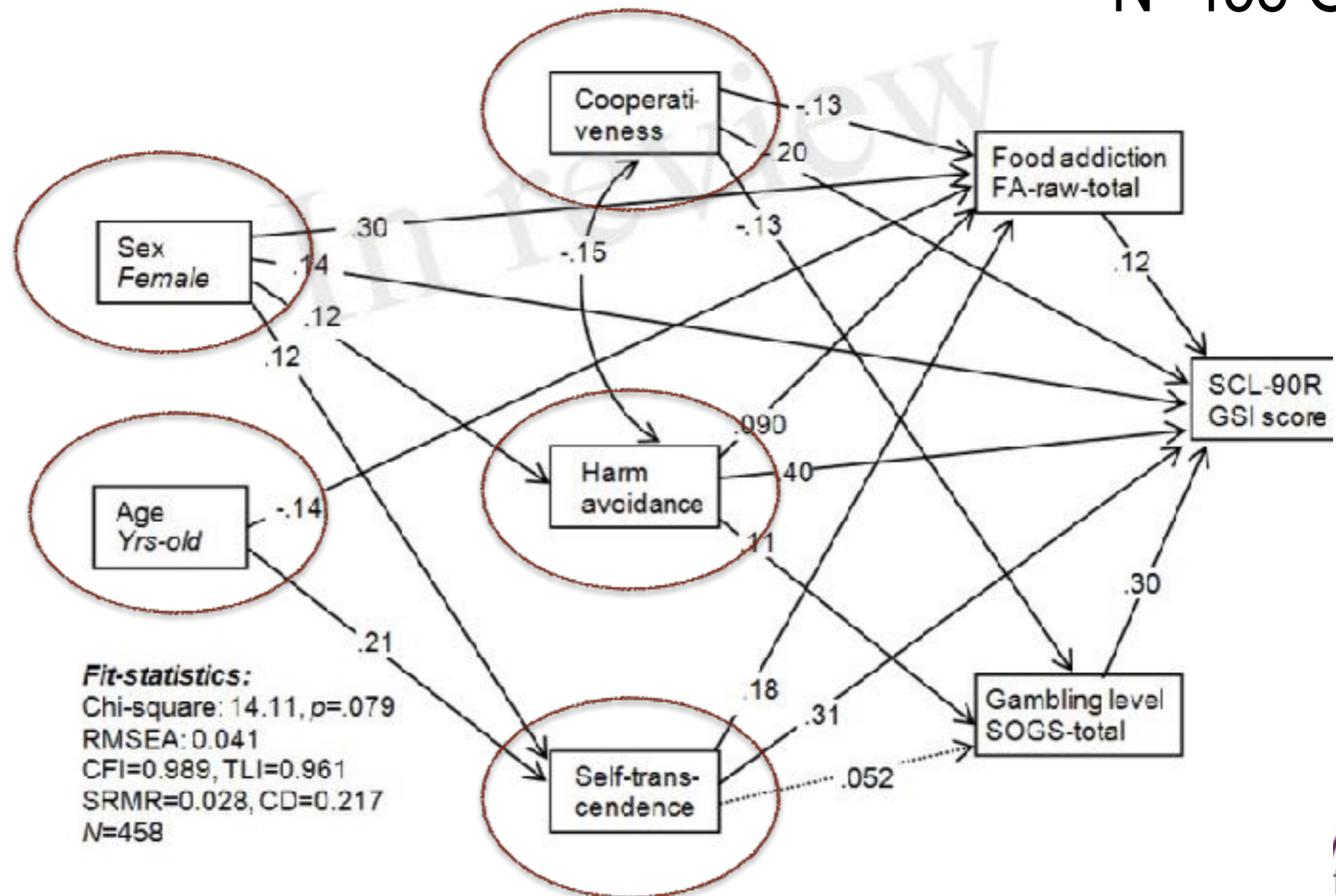## *Current Facts*

Gambling Disorder and Food Addiction

Food Addiction in Gambling Disorder: Frequency and Clinical Outcomes

Susana Jiménez-Murcia[1,2,3], Roser Granero[1,4], Ines Wolz[1,2], Marta Baño Alcázar[2], Gemma Mestre-Bach[1,2], Trevor Steward[1,2], Zaida Agüera[1,2], Anke Hinney[5], Carlos Blaguer[1,6], Felipe F. Casanueva[1,7], Ashley N. Gearhardt[8], Andreas Hakansson[9], Jose M. Menchon[1,3,10], Fernando Fernández-Aranda[1,2,3]

30% females vs. 6% males

N=458 GD

Fit-statistics:
Chi-square: 14.11, p=.079
RMSEA: 0.041
CFI=0.989, TLI=0.961
SRMR=0.028, CD=0.217
N=458

Food Addiction among ED and GD

Granero et al.,*Frontiers in Psychiatry*, 2018
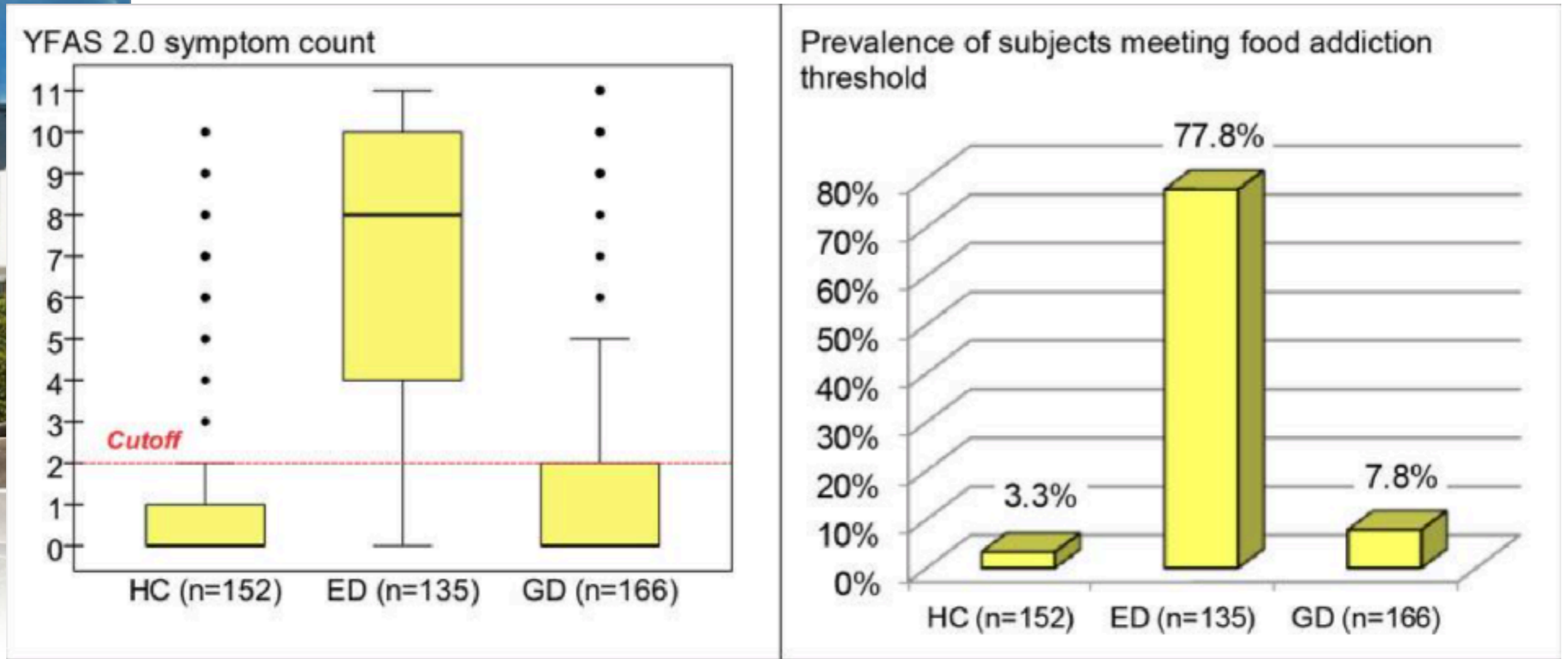
Psychoeducational GT for BN and Food Addiction
Structure and design

Jiménez-Murcia, Dublin, 2019

European Eating Disorders Review **beat!**

Research Article

Food Addiction in Bulimia Nervosa: Clinical Correlates and Association with Response to a Brief Psychoeducational Intervention

Ines Hilker, Isabel Sánchez, Trevor Steward, Susana Jiménez-Murcia, Roser Granero, Ashley N. Gearhardt, Rita Cristina Rodríguez-Muñoz, Carlos Dieguez, Ana B. Crujeiras, Iris Tolosa-Sola, Felipe F. Casanueva, José M. Menchón, Fernando Fernández-Aranda ✉

First published: 4 September 2016

DOI: 10.1002/erv.2473

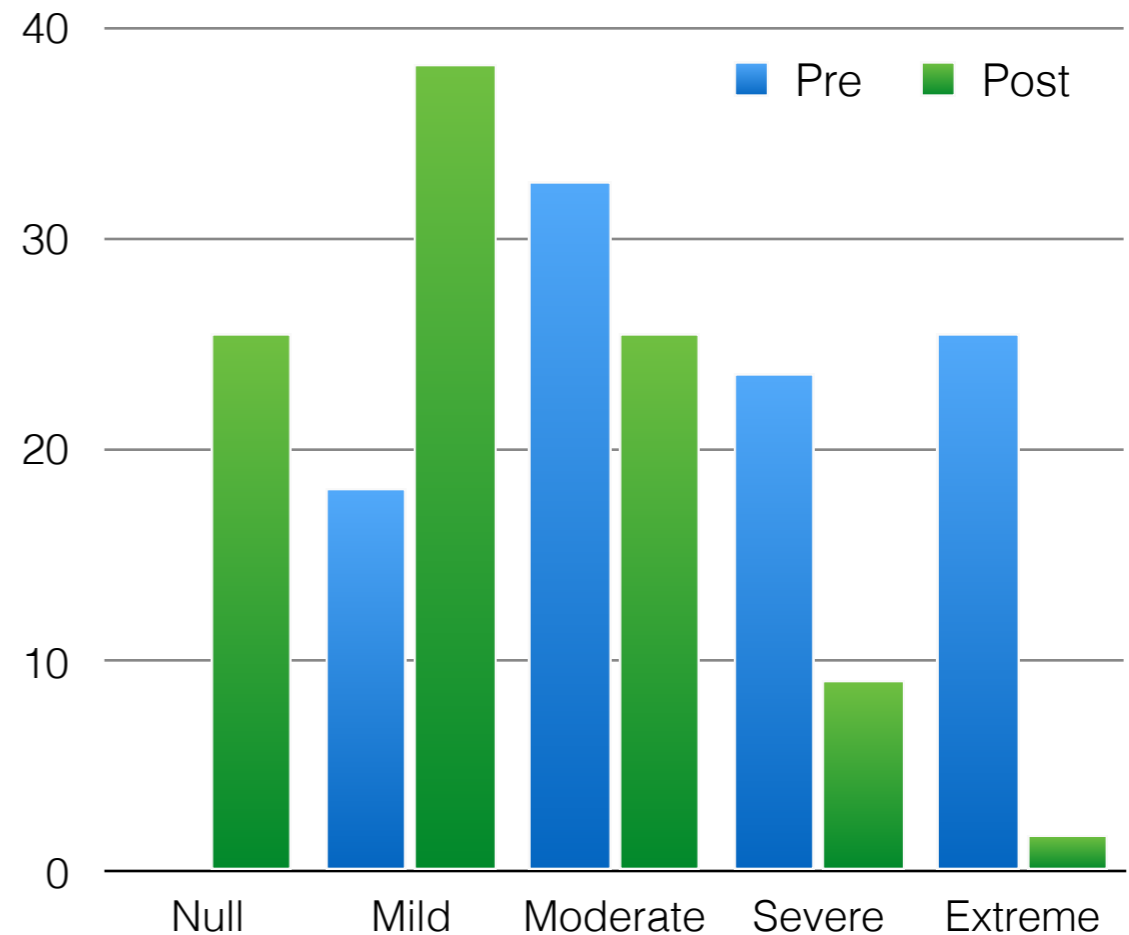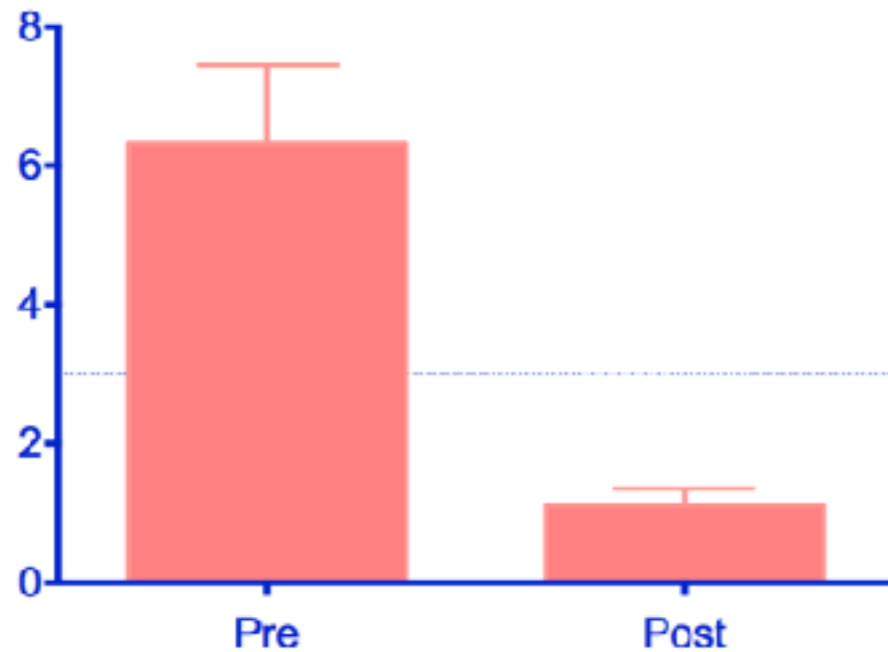6 WEEKLY SESSIONS
90 MIN. DURATION
8-10 PATIENTS

Goals:
• General information about Bulimia nervosa, negative consequences
• Nutritional patterns and monitoring
• Self-management concerning binge eating and vomits
•Cognitive rationale
• Problem solving strategies
• Response prevention strategies

Hilker, I., (2016) Food Addiction in Bulimia Nervosa: Clinical Correlates and Association with Response to a Brief Psychoeducational Intervention. Eur. Eat. Disorders Rev., 24: 482–488. doi: 10.1002/erv.2473.

Results
Comparison pre-post average scores on FA criteria   N=66 BN

	Pre-therapy		Post-therapy		Pre-post comparison						
	Mean	SD	Mean	SD	MD	SE	$t_{df=54}$	p	95%CI MD		$|d|$
FA: total criteria	6.13	1.13	5.02	1.95	1.11	0.243	4.56	**<.001***	0.62	1.60	**0.70†**

Note. SD: standard deviation. MD: mean difference/change pre-post.
*Bold: significant pre-post change. †Bold: moderate ($|d|$>0.50) to high effect size ($|d|$>0.80).

Results

Comparison pre-post average scores on FA positive scores and sub scales variation

	Prevalence (%)			
	Pre-treatment (%)	Post-treatment (%)	*p*	|*d*|
Substance taken for longer period than intended	81.3	60.4	.021[†]	0.50[‡]
Persistent desire or repeated unsuccessful attempts to quit	100.0	95.8	.500	0.29
Much time/activity to obtain, use, recover	93.8	75.0	.006[†]	0.53[‡]
Important social-occupational-recreational activities reduced	92.2	77.1	.039[†]	0.43
Use continues despite knowledge of adverse consequences	73.4	50.0	.006[†]	0.50[‡]
Tolerance	84.4	81.3	.999	0.08
Characteristic withdrawal; substance taken to relieve withdrawal	89.1	68.8	.013[†]	0.51[‡]
Food addiction: positive diagnosis	90.6	72.9	.012[†]	0.50[‡]

Note: Exact McNemar test
[†]Significant pre–post change.
[‡]Moderate (\|*d*\| > 0.50) to high effect size (\|*d*\| > 0.80). (*n* = 55).

Criteria	B	S.E.	Wald	*p*	OR	95% CI (OR)		R^2	AUC
Being into the good responder group	−0.619	0.440	1.98	.159	0.54	0.23	1.28	.077	.604
Abstinent binges/vomits	−0.622	0.28	4.85	**.018**	0.54	0.31	0.93	.146	.682
Dropout from treatment	−0.043	0.276	0.02	.877	0.96	0.56	1.65	.001	.500

Note. R^2: Nagelkerke's-R^2 coefficient. AUC, area under the receiver operating characteristic curve; 95% CI, 95% confidence interval; OR, odds ratio; B, estimated logistic regression coefficient; SE, standard error.
Bold: significant predictive capacity (.05 level).
Good responders: change to a lower severity group after treatment. (*n* = 55).

Food Addiction and EWL in BS patients

Guerrero et al., EEDR, 2018

SPECIFIC FOOD ADDICTION PHENOTYPES USING SOCIODEMOGRAPHIC AND CLINICAL CLUSTERING ANALYSIS
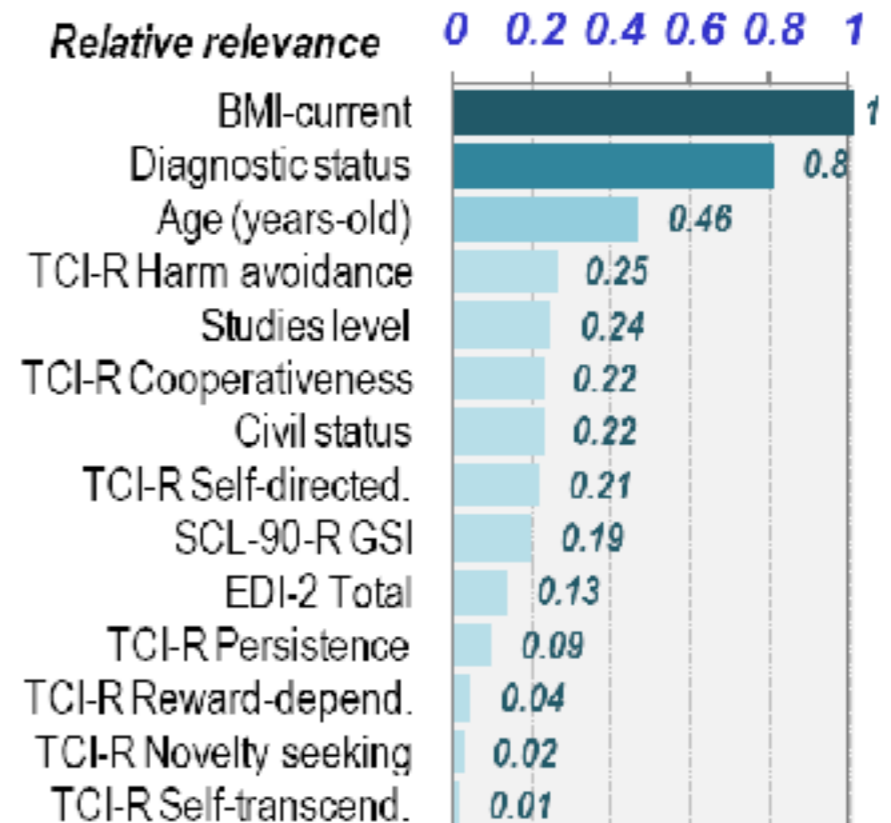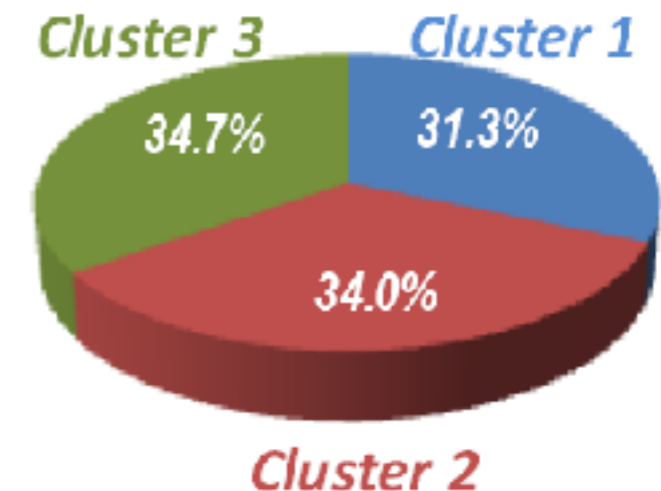
Jiménez-Murcia, Dublin, 2019

- **Sample.** Initial sample included *n*=165 participants who met criteria for positive FA score in the YFAS-2 scale.
Males were excluded (*n*=18). The final sample comprised *n*=47 women [53 with Bulimia nervosa (BN), 30 with Binge Eating Disorder (BED), 36 with Other Specified Feeding or Eating disorder (OSFED) and 28 with obesity (OBE)]. All ED were diagnosed according to DSM-5 criteria (APA, 2013).

- **Statistical analysis.** Two-step cluster (SPSS)

- Food Addiction Scale (YFAS-2.0)
  (Gearhardt et al., 2016; Granero et al., 2018)

- Symptom Checklist-90 Items-Revised (SCL-90-R)
  (Derogatis, 1990)

- Temperament and Character Inventory–Revised(TCI-R)
  (Cloninger, 1999)

- Eating Disorders Inventory (EDI-2)
  (Garner et al., 1991)

Three clusters identified

Cluster 3 34.7% | Cluster 1 31.3% | Cluster 2 34.0%

Relative relevance   0   0.2 0.4 0.6 0.8   1

BMI-current	1
Diagnostic status	0.8
Age (years-old)	0.46
TCI-R Harm avoidance	0.25
Studies level	0.24
TCI-R Cooperativeness	0.22
Civil status	0.22
TCI-R Self-directed.	0.21
SCL-90-R GSI	0.19
EDI-2 Total	0.13
TCI-R Persistence	0.09
TCI-R Reward-depend.	0.04
TCI-R Novelty seeking	0.02
TCI-R Self-transcend.	0.01

SPECIFIC FOOD ADDICTION PHENOTYPES USING SOCIODEMOGRAPHIC AND CLINICAL CLUSTERING ANALYSIS
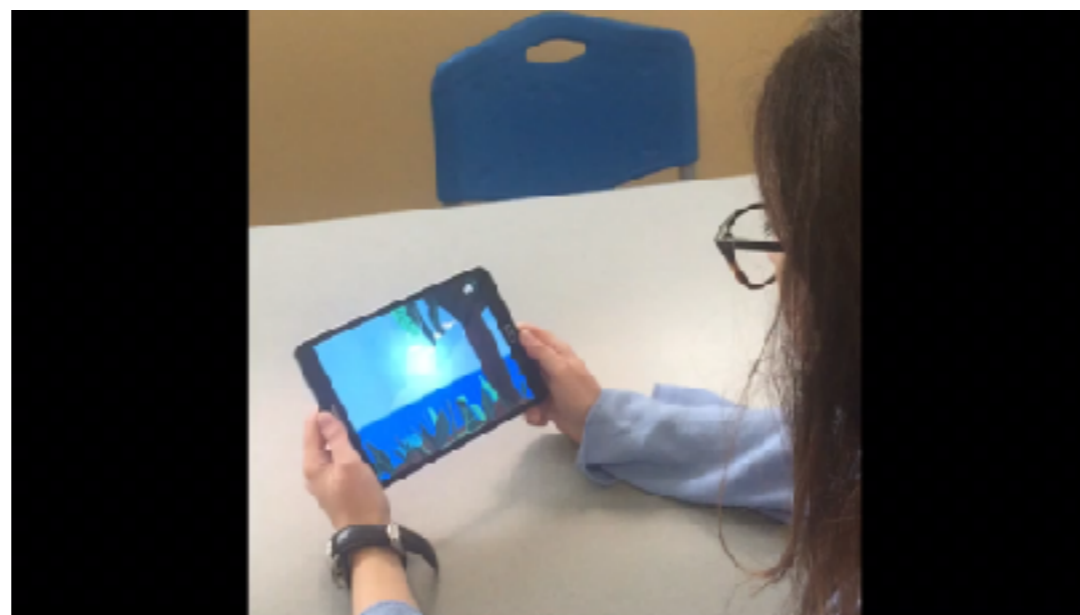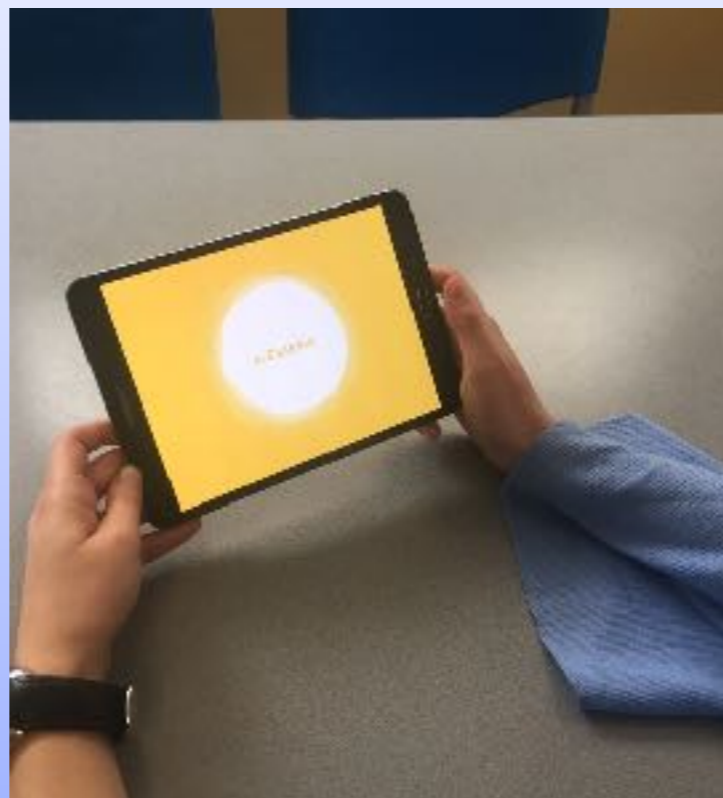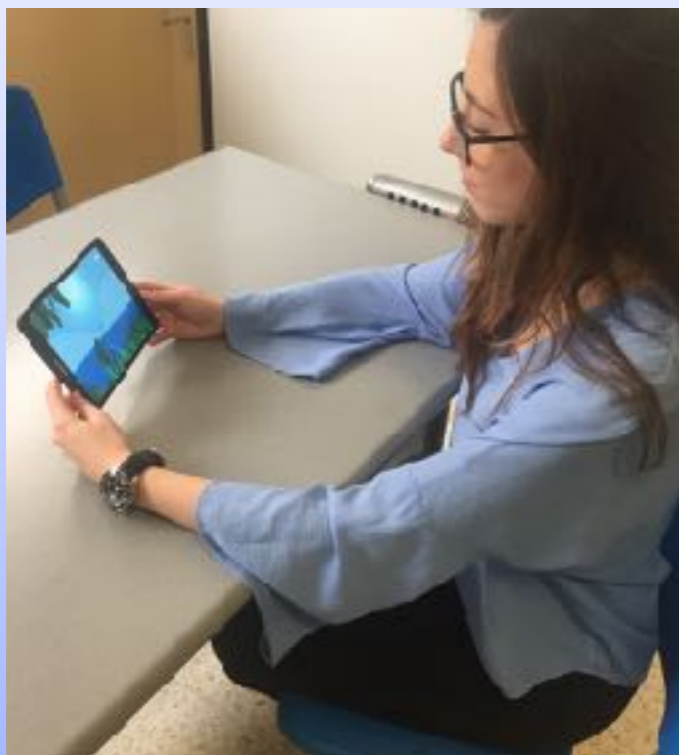## *Jiménez-Murcia, Dublin, 2019*

- **Cluster 1 (*n*=46). Functional cluster**, was characterized by a high prevalence of obese subjects (without ED) and BED, both with low levels of ED severity and general psychopathology. Patients were older and with higher BMI.

- **Cluster 2 (*n*=50). Moderate cluster**, was less functional than Cluster 1, showed a high prevalence of BN and OSFED, and moderate levels of ED severity and an intermediate position in psychopathology levels compared to Clusters 1 and 3.

- **Cluster 3 (n=51). Dysfunctional cluster**, was characterized by the highest prevalence of BN and OSFED and highest scores in ED severity and general psychopathology, and more dysfunctional personality traits.
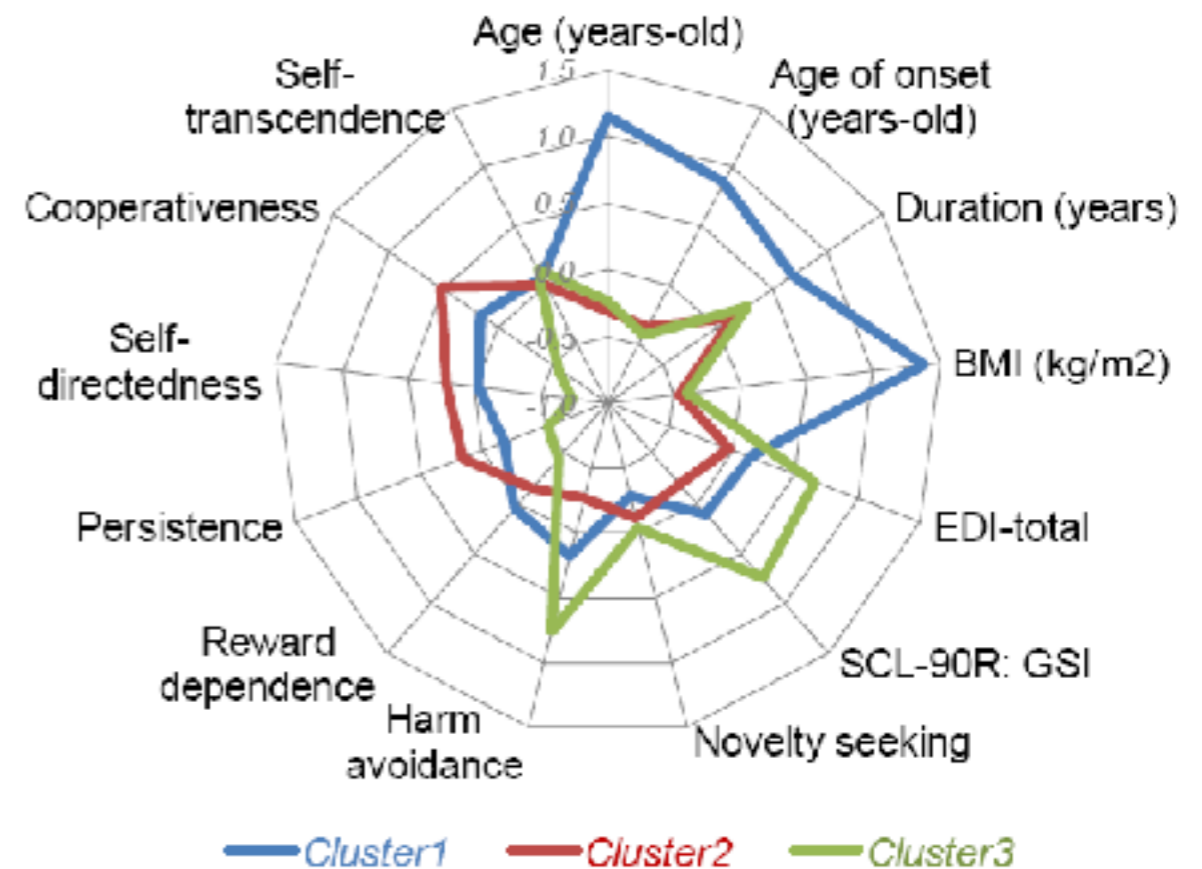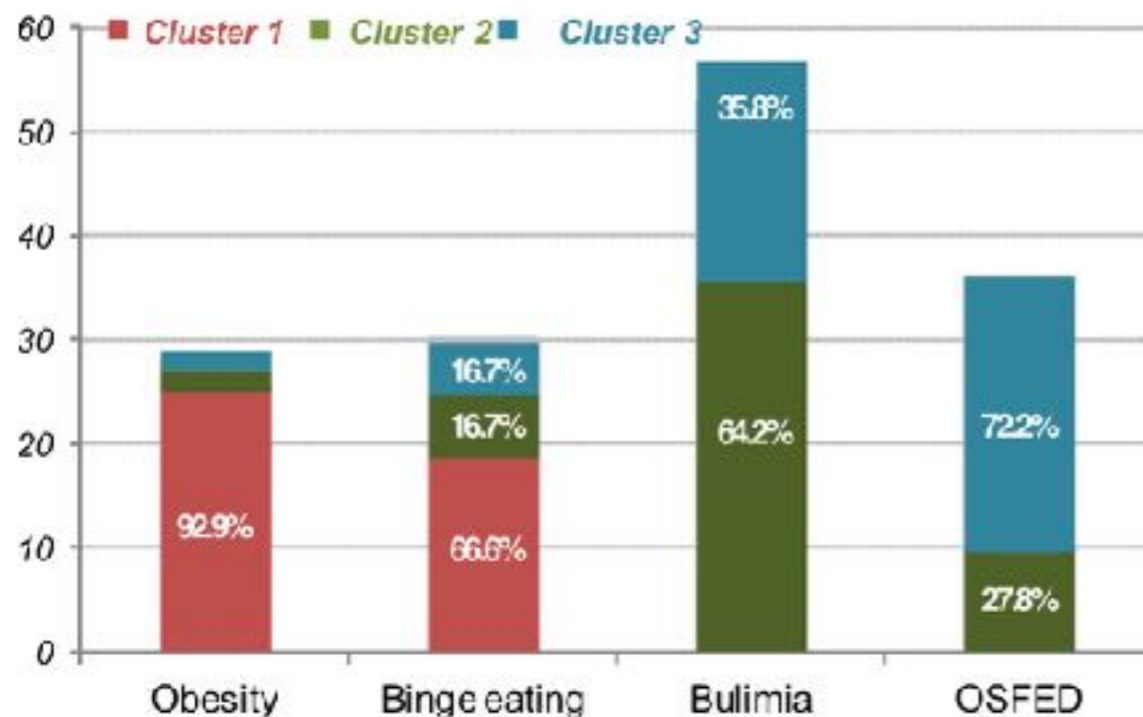
FUTURE CHALLENGES
e-ESTESIA: EMOTIONAL REGULATION APP
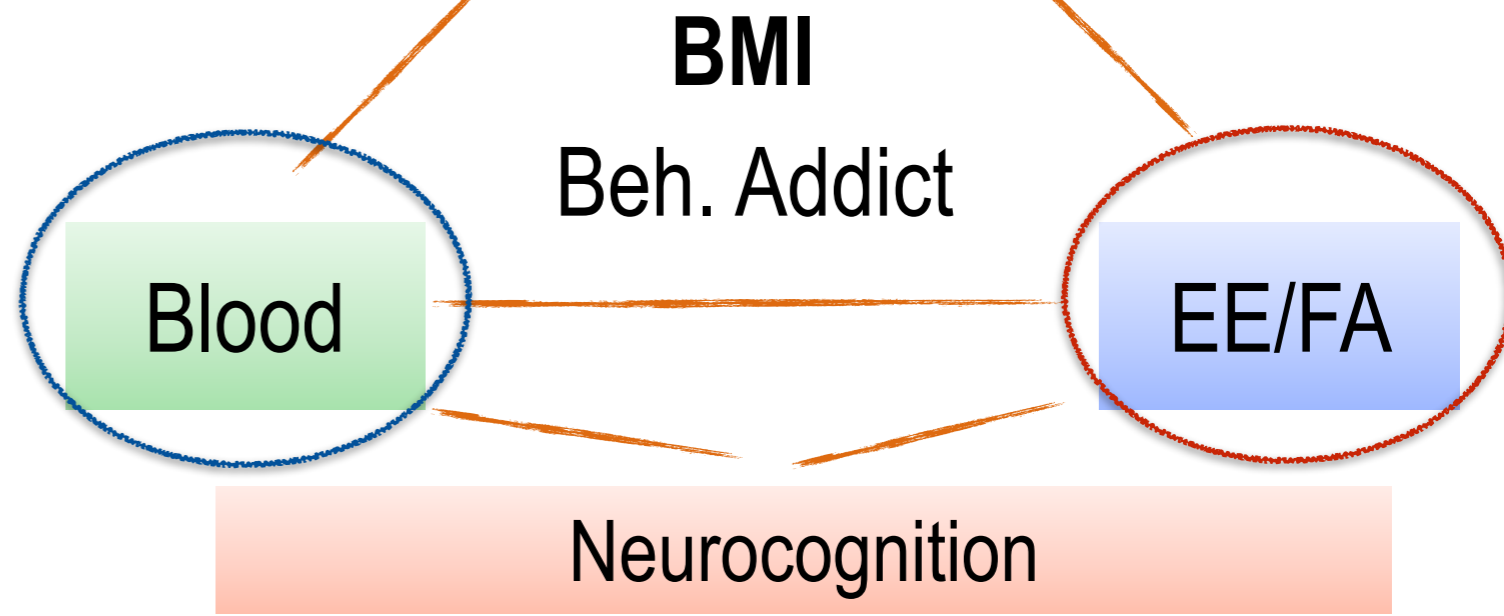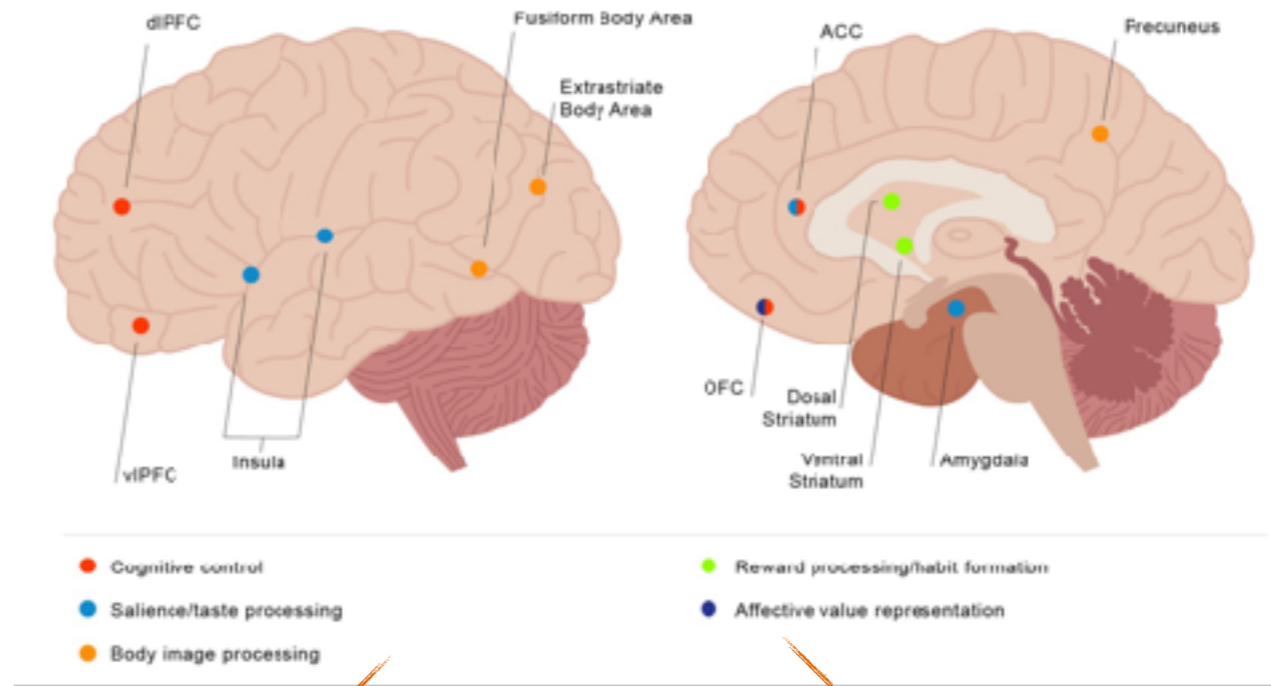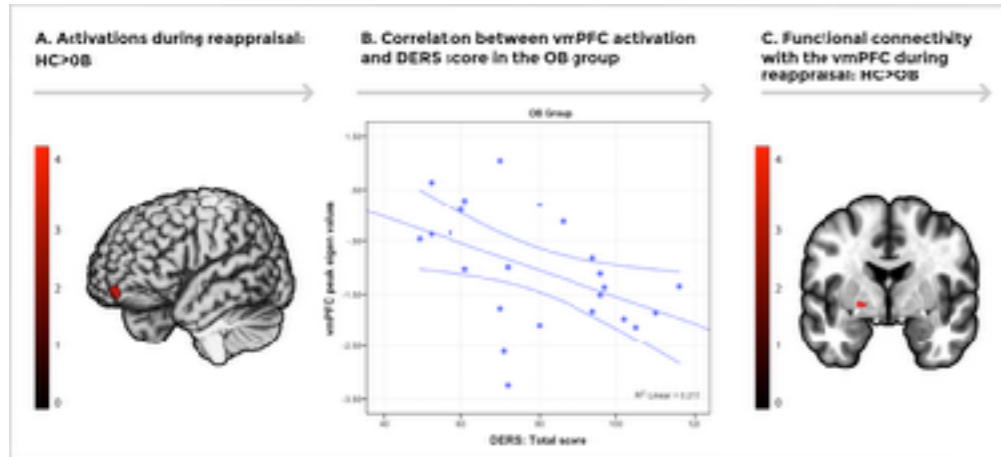
2016-2018

PSI2015-68701R

Future Research

Jiménez-Murcia, Dublin, 2019

BMI
Beh. Addict

Blood

EE/FA

Neurocognition

Steward, 2017 Current Neuropharmacology

The Professional Jour...

European Eating Disorders Review

Beat
Eating disorders

- Food Addiction: A Transdiagnostic Construct of Increasing Interest
- Testing the Addictive Appetite Model of Binge Eating
- Role of Adipokines and Gastrointestinal Signals for Binge Eating in Animal Models
- Compulsive 'Grazing' and Addictive Tendencies towards Food
- Food Addiction and Impaired Executive Functions in Obesity
- Food addiction and other Addictive Behaviors in Bariatric Surgery
- Food Addiction among Men and Women in India
- Yale Food Addiction Scale for Children 2.0: Validation scoring
- Serum Leptin Levels with Food Addiction in Adolescent Psychiatric Patients
- Food Addiction and Non-suicidal Self-injury amongst Eating Disorder
- Body Uneasiness and Food Addiction Symptoms
- Food Addiction and Preoperative Weight Loss Achievement in Bariatric Surgery
- Food Addiction and Low Calorie Diet in Overweight: Therapy implications
- Food addiction in Russian Adolescents

EDITOR FERNANDO FERNÁNDEZ-ARANDA

WILEY

Impact Factor: 3.201

Wiley Online Library

Q Login / Register

European Eating Disorders Review

Beat

HOME | ABOUT ∨ | CONTRIBUTE ∨ | BROWSE ∨

Issue archive

2018 - Volume 26, European Eating Disorders Review

2018 - Volume 26
2017 - Volume 25
2016 - Volume 24
2015 - Volume 23
2014 - Volume 22
2013 - Volume 21
2012 - Volume 20
2011 - Volume 19
2010 - Volume 18
2000 - 2009

Volume 26, Issue 6
Pages 533-676
November 2018

Volume 26, Issue 5
Pages 373-532
September 2018

☑ Submit an Article
📄 Browse free sample issue
🔔 Get content alerts
👍 Recommend to a librarian
⭐ Subscribe to this journal
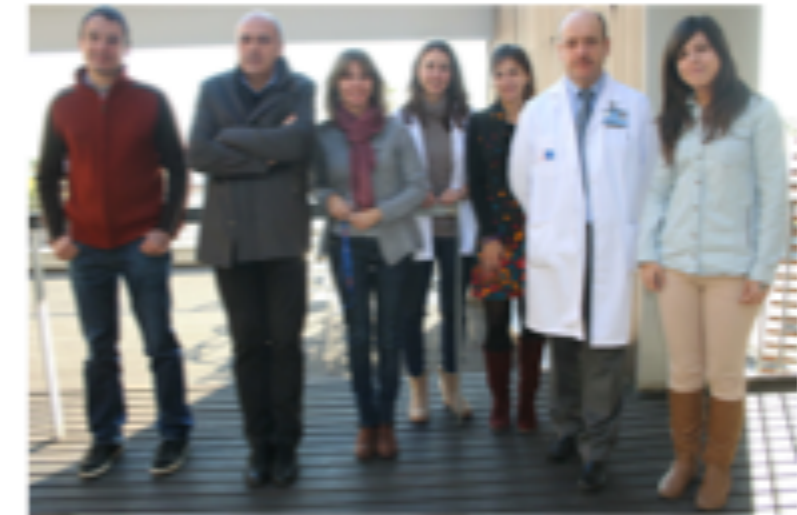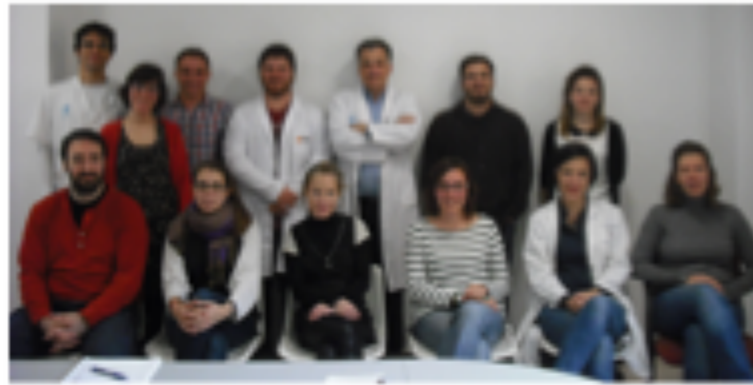
More from this Journal
- News
- About Beat Services

---

ciberobn

GOBIERNO DE ESPAÑA — MINISTERIO DE CIENCIA E INNOVACIÓN

Instituto de Salud Carlos III

European Union
European Regional Development Fund

Conclusions

- To conclude, the association of environmental factors such as easy access, types of food, portions and psychological factors such as stress, boredom, impulsivity, together with a biological predisposition could explain FA.

- However, further research about biomarkers in FA is needed.

- In short, we need to analyze other explanatory models of obesity, such as the addictive one, in order to try to improve prevention, treatment and social and health policies.

Thank you!

ciberobn
Centro de Investigación Biomédica en Red
Fisiopatología de la Obesidad y Nutrición

European Regional
Development Fund