

Combining Cultural and Individual Dimensions in the Analysis of Hazardous Behaviours: An Explorative Study on the Interplay Between Cultural Models, Impulsivity, and Depression in Hazardous Drinking and Gambling

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Abstract

We aimed in this study to analyse how impulsivity and depression are related to hazardous gambling and drinking, while taking into account the moderating effects of the cultural models that people use to interpret their social environment. Cultural models, impulsivity, depression, hazardous gambling, and drinking were assessed in a convenience sample of 329 subjects recruited in three contexts (university, health services and support settings, venues for gambling and drinking) in South-eastern Italy. Mixed models were used to explore the influence of the different variables separately and the interaction between cultural models and the other predictive variables (impulsivity and depression). The findings show that different cultural models of the social environment are related to different probabilities of hazardous drinking and gambling. Heavy drinkers and gamblers tend to perceive their social world as an extremely anomic environment. In the case of hazardous drinking, this critical view of the social environment is associated with lack of premeditation, lack of perseverance, sensation seeking, and depression. In the case of gambling, this view is associated with sensation seeking and depression. Moreover, the way in which the participants evaluated the social environment was found to moderate the influence of depression in hazardous drinking and of sensation seeking in hazardous gambling. The findings of this exploratory study offer support to the idea that exploring cultural factors and how they combine with other psychological and psychosocial risk factors may promote a better understanding of people's engagement in hazardous behaviours.

Keywords: hazardous gambling, hazardous drinking, cultural models, impulsivity, depression, multilevel regression model

Résumé

Dans cette étude, notre objectif était d'analyser le lien entre impulsivité et dépression, d'une part, et les risques de jeu et la consommation d'alcool, d'autre part, tout en

tenant compte des effets modérateurs des modèles culturels que les gens utilisent pour interpréter leur environnement social. Les modèles culturels, l'impulsivité, la dépression, le jeu à risque et la consommation d'alcool ont été évalués sur un échantillon de commodité de 339 sujets recrutés dans trois contextes différents (université, services de santé et structures de soutien, lieux de jeu et de consommation d'alcool), dans le sud de l'Italie. Pour explorer séparément l'influence des différentes variables et l'interaction entre les modèles culturels et les autres variables prédictives (impulsivité et dépression), on a utilisé des modèles mixtes. Les résultats montrent que différents modèles culturels d'environnement social sont liés à différentes probabilités de consommation dangereuse d'alcool et de jeu problématique. Les gros buveurs et les joueurs excessifs ont tendance à percevoir leur monde social comme un environnement extrêmement anémique. Dans le cas de la consommation abusive d'alcool, cette vision critique de l'environnement social est associée à un manque de préméditation, à un manque de persévérance, à la recherche de sensations et à la dépression. Dans le cas de problème de jeu, ce point de vue est associé à la recherche de sensations et à la dépression. De plus, on a démontré que la manière dont les participants évaluaient l'environnement social diminuait l'influence de la dépression liée à une consommation d'alcool abusive et de la recherche de sensations fortes dans le jeu problématique. Les résultats de cette étude exploratoire sous-tendent l'idée voulant que l'exploration de facteurs culturels et la manière dont ils se combinent à d'autres facteurs de risque psychologiques et psychosociaux permettent de mieux comprendre la propension des personnes à adopter des comportements à risque.

Introduction

In the mainstream approach to hazardous drinking and gambling, these conditions are depicted as being characterized by an unhealthy and uncontrollable urge to use a substance or to engage in a certain activity that has maladaptive and disastrous results for both mental and physical health and in the areas of work and relationships (American Psychiatric Association [APA], 2013; Robinson & Berridge, 2001). The current edition of the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; APA, 2013) classifies problem gambling in the same category as substance use: "addiction and related disorders." The rationale for this choice is that the growing scientific literature reveals common elements between gambling and substance use disorders, ranging from the external consequences of financial problems and destruction of relationships to the biological and psychological process identified as the foundation of addictive behaviours (Pace, Schimmenti, Zappulla, & Di Maggio, 2013; Reilly & Smith, 2013).

The main assumption on which scientists' and health professionals' perspectives on addiction are based is that the predictable way of behaving and acting is due to a specific configuration of an encapsulated mind: The problem lies in the brain and

mind. The trait-based approaches stress that certain individuals possess undeniable qualities (e.g., neurobiological alterations, high levels of impulsivity, short-sightedness towards delayed outcome of choice, deficit in mood regulation) that make them more likely to engage in hazardous behaviour. It is worth observing that the way in which a problem is defined, even implicitly, has flow-on effects on how policies are envisaged (Bacchi, 2009). After problem gambling (or problem drinking or drug use) is interpreted as a matter of individual health more than a political, cultural, or social concern, neither the government nor the social network (family, peers, neighbourhood) is responsible for restricting its consumption (Reith, 2007), or for reflecting on the ways they fuel or constrain individual attitudes towards gambling or drinking: The individual becomes the privileged target of the intervention (Venuleo & Marinaci, 2017).

On the other hand, cross-cultural, ethnographic, and anthropological studies underline that gambling, like hazardous alcohol use, takes on different meanings in different cultural contexts and serves different functions regarding the relationship between the individual and his or her community (cf. Binde, 2005; Room & Mäkelä, 2000). Longitudinal studies, grounded on theories of social learning and cultural capital, reveal the importance of daily interactions with family members, friends, and other referents in constructing the meaning of gambling (McComb & Sabiston, 2010) or drinking (M. D. Wood, Read, Mitchell, & Brand, 2004) and in the ways that individuals move in and out of problem behaviour over time (gambling: Reith & Dobbie, 2011; drinking: Chassin et al., 2002).

According to the cultural standpoint (Raylu & Oei, 2004; Room & Mäkelä, 2000; Valsiner, 2000), the engagement of people in hazardous behaviours cannot be understood independently of their cultures and intersubjective life worlds. The very concept of risk is inherently subjective (Krimsky & Golding, 1992; Slovic, 1999), meaning different things to different individuals and cultural groups. Abt, McGurrin, and Smith (1985) observe that contexts “provide the participants ready-made cultural texts or rationales for their own constructions of reality” (p. 79). Accordingly, any model of hazardous behaviours must focus on people’s interpretations and evaluations of the meaning of activities within a social and cultural context. “If we wish to explore Chinese attitudes towards chance and money, we must also discuss their attitudes towards destiny, luck and work” (Papineau, 2005, p. 165).

Cole (1996) points out the need to consider cultural variability in psychological processes to know whether such processes are universal or specific to particular cultural circumstances. Culture may play a leading role in moderating the effect of different protective or risk factors (Venuleo & Marinaci, 2017). For instance, it is recognized that the risk factors of pathological gambling are different in different communities (Papineau, 2005) and ethnic groups (Kim, Kim, & Nochajski, 2012). Similar evidence was found regarding hazardous drinking (Rissel, McLellan, & Bauman, 2000), as well as other types of disorders (i.e., post-traumatic disorder: Bhugra & Mastrogianni, 2004; schizophrenia: Jenkins, 2007; mood disorder: Perilla, Norris, & Lavizzo, 2002). However, several studies based the analysis of cultural

differences and their impact on hazardous behaviours in terms of differences between societies (Pöysti & Majamäki, 2013) that have different characteristics regarding ethnicity, race, nationality, and specific attitude (i.e., collectivist vs. individualistic cultures), with little recognition of the cultural variability among people belonging to the same society (Calogiuri & Venuleo, 2017; Cohen, 2009; Room & Mäkelä, 2000; Valsiner, 2003).

The Present Study

In this study, we investigated the role of inter-individual cultural differences in the way in which people interpret their social experience. More specifically, we suggest that people's cultural models, understood as systems of meanings, may either encourage or discourage hazardous behaviours, both by establishing what people recognize as "hazardous" and what hazardous behaviours might mean in their lives and by moderating the role of other factors that might refer to individual functioning or impairment (i.e., personality traits, affects, mood regulation). We refer to these meanings in terms of cultural models to stress the assumption that they are intrinsically intersubjective and social. The macro-social dimensions and intersubjective life worlds of people provide the semiotic resources that ground the way that they perceive and experience the social world (Zittoun, 2006), thus placing constraints on the virtually infinite number of ways in which people can interpret their experience.

On the basis of a semiotic and cultural research tradition, we use the notion of cultural models to refer to specific systems of generalized meanings that organize the perspective through which people look at their context and thus the way to act, think, and feel (Cohen, 2009; Corin, 1995; Salvatore & Venuleo, 2013; Valsiner, 2007). The notion of a cultural model may recall that of subculture (Abt et al., 1985), traditionally understood as a set of ways of understanding, behaviours, and artefacts used by particular groups. Nonetheless, we prefer the former term because subcultures have often been equated with a set of persons who were identified through demographic features (such as youth), or a collective that was identified through a specific system of activity (such as a gang; Fine & Kleinman, 1979). In contrast, a cultural model (as intended here) consists of individual positioning within the socially shared symbolic universe, which may favour different systems of activity and groupings of people who are very different from a socio-demographic point of view (Venuleo, Salvatore, & Mossi, 2015). Individual positioning derives both from people's own biographies and from the collective or shared sociocultural forms of thinking, communicating, and acting (what we refer to in terms of culture) that form the traditions of society (Dressler, 2004). Incidentally, this means that the role of culture can be studied in terms of differences between individuals within a society and is not limited to differences between societies.

It is worth emphasizing that we call the meanings making up cultural models "generalized" because they do not concern single elements (events, rules, tasks, goals, family, friends, services, and so on) of the life experience, but serve as the

“lens” through which people interpret the experience as a whole. In other words, generalized meanings orient the way people are predisposed to act and react in the world through different circumstances and relationships (Salvatore & Venuleo, 2008; Venuleo, Salvatore, & Mossi, 2015). Here, we are thinking of expressions such as “Life is a matter of duties and responsibilities” or “It’s better to burn out than to fade away” or “You cannot trust anyone.” Previous studies, based on the view of cultural models proposed above, highlighted the role of cultural models that people use to interpret their social environment when differentiating social gamblers from pathological gamblers (Venuleo, Salvatore, & Mossi, 2015), as well as alcoholics from a control group (Venuleo, Calogiuri, & Rollo, 2015). In all cases, the problem group was characterized by a negative view of both the micro and macro social environment, perceived as anomic, unreliable, and destined not to change at all. In this study, we intended to examine this matter in greater depth by pursuing two main goals.

Our first goal was to analyse the influence of cultural models on two different hazardous behaviours related to drinking and gambling. Our general hypothesis was that the way people relate to hazardous behaviours conveys points of view not only on the target behaviours, but, more broadly, on people’s social experience. More specifically, we expected that cultural models associated with a critical image of the social environment, devaluing social ties and the rules of coexistence, were more likely to be associated with hazardous drinking and hazardous gambling (Venuleo, Rollo, Marinaci, & Calogiuri, 2016). This suggestion is consistent with the notion of “cultural consensus” proposed by Dressler and colleagues (2007) to emphasize that the degree to which individuals, in their own beliefs and behaviours, approximate widely shared cultural models (e.g., their “cultural consensus”) is associated with the levels of their psychological and psychosocial distress and health outcome. The higher prevalence of involvement in high-risk behaviours among minorities exposed to the effects of acculturation-related stress (Factor, Kawachi, & Williams, 2011; Martinez, 2006), as well as the results from studies exploring the relationship between moral disengagement and gambling and alcohol use (Barnes, Welte, Hoffman, & Dintcheff, 1999; Newton, Havard, & Teesson, 2012), offers indirect support to the idea that a critical view of one’s social environment can constitute a sociocultural terrain for engagement in hazardous behaviours (Cox, Burr, Blow, & Parra Cardona, 2011). The hypothesis is also consistent with what is suggested by qualitative research: Evidence suggests that such behaviours and health-related lifestyles emerge in relation to social malaise, often related to feelings of meaninglessness, lack of a sense of belonging, and feelings of alienation (powerlessness and hopelessness; Borrell & Boulet, 2005; Paluoso, 2000).

The second aim of the study was to explore the role of cultural models in moderating the impact of individual factors associated with hazardous gambling and alcohol use. We selected two different risk factors, impulsivity and depression, whose association with both hazardous gambling and hazardous drinking has been established by various studies.

Impulsivity. This is the most frequently cited risk factor for maladaptive behaviours (Anestis, Selby, & Joiner, 2007) and various authors agree that impulsiveness,

or some specific facets of it, make individuals more prone to approach a behaviour without considering the consequences, such as heavy drinking (Carlson, Johnson, & Jacobs 2010), pathological gambling (Nower, Derevensky, & Gupta, 2004; Verdejo-García, Lawrence, & Clark, 2008), and other forms of behavioural dependence (Lejoyeux, Mc Loughlin, & Ades, 2000). “After all, an inability to inhibit consumption despite an effort to do so in the face of negative consequences is a textbook definition of impulsive behavior and a key component of alcohol dependence” (Whiteside, & Lynam, 2003, p. 70), as well as of gambling dependence (Rosenthal, 1992).

However, one has to recognize that impulsivity may be expressed through very different behaviours in everyday life (i.e., talking on the phone while crossing the road, risky driving, unsafe sex), corresponding to different levels of harm and social adaptation (Gullo & Dawe, 2008; Schulenberg & Maggs, 2002). Contextual factors may influence the interaction between impulsivity and outcome behaviour (Zimmerman, 2010). This argument is supported by the evidence that, although impulsivity as a trait is universally recognizable, the prevalence of hazardous and harmful drinking and other impulsive behaviours differs in different historical periods (Sweeting & West, 2003) and in different societies (Rehm et al., 2003). It is reasonable to assume that people who are high on impulsivity are, remain, or become hazardous drinkers (rather than hazardous gamblers, drivers, and so on) when their impulsivity interacts with a social and cultural environment that allows their drinking to begin and to be maintained (Venuleo, Calogiuri, & Rollo, 2015). From a cultural standpoint, what differentiates socially acceptable impulsive behaviours from the unacceptable forms varies from one culture to another, from one era to another (Evdenden, 1999), and variation in the meaning of impulsive behaviours may play a role in the different rates. For instance, a body of research highlights how a variety of risky behaviours have higher rates in nations with more individualistic cultural orientations and have lower rates in collectivistic cultures, emphasizing values such as conformity, obedience, and in-group harmony (Schwartz et al., 2011).

Depression. One issue that has been examined in detail is the association between alcohol use disorders and major depression (Conner, Piquart, & Gamble, 2009; Jane-Llopis & Matytsina, 2006), which is robust to variations in both study design and measurement method (Boden & Fergusson, 2011). Depression has also been found to be a risk factor for problem gambling (Griffiths & Wood, 2000; Gupta & Derevensky, 1998; Lynch, Maciejewski, & Potenza, 2004; Raylu & Oei, 2004). Several scholars have suggested that people often make use of alcohol or gambling to regulate unpleasant emotions (drinking: Gonzalez, Reynolds, & Skewes, 2011; Holahan, Moos, Holohan, Cronkite, & Randall, 2001; gambling: Gupta, Derevensky, & Marget, 2004; R. T. Wood & Griffiths, 2007) as a means of palliative escape and to relieve symptoms of psychological distress, including anxiety and depression. Other scholars have suggested that depressive symptoms are likely to be an effect of alcoholism (Schuckit, Irwin, & Smith, 1994; Swendsen et al., 1998) and gambling (Rosenthal & Lesieur, 1992), or to have a bidirectional relationship with them; for example, financial losses resulting from gambling may exacerbate depressed affect and

maintain the need to continue gambling (Blaszczynski, Winter, & McConaghy, 1986). Few studies have explored the role that social-cultural context plays in the association between depression and hazardous behaviours. Yet also in this case, it must be recognized that psychological distress and ways of coping with it may be influenced by social and cultural factors such as social isolation, lack of social support, racism, unemployment and poverty, poor housing, and lack of access to appropriate medical care (Bhugra & Becker, 2005), as well as by the cultural meanings through which people interpret their social condition and what happens in their life. For instance, take two people viewing the social environment through two different lenses, Subject A, seeing the social environment as an unwelcoming place, lacking opportunities for development, governed by dishonest politicians, and inhabited by people who think only of themselves, and Subject B, expressing faith in people's willingness to help each other in times of trouble and trust in the institutions' attempt to encourage people to develop and to improve the country. It is reasonable that these different attitudes influence the association between depression and hazardous behaviours in two ways: They may have an impact on the ways in which people interpret and cope with difficulties that are related to depression and the need to escape by drinking or gambling, and they may influence the ways in which people interpret and cope with difficulties that are related to drinking and gambling, with a resulting increase or decrease in psychological distress.

Hypothesis and Exploratory Research Questions

On the basis of the previous literature, we hypothesized the following:

1. There is a positive association between impulsivity and both hazardous drinking and hazardous gambling (Hypothesis a).
2. There is a positive association between depression and both hazardous drinking and hazardous gambling (Hypothesis b).

Regarding the role of cultural models, we identified the following exploratory research questions:

1. Different cultural models are associated with both hazardous drinking and hazardous gambling to different degrees.
2. Cultural models interact with impulsivity in affecting the likelihood of hazardous drinking and hazardous gambling.
3. Cultural models interact with depression in affecting the likelihood of hazardous drinking and hazardous gambling.

Method

Participants

The study was conducted in a middle-sized town in south-eastern Italy, based on a convenience sample of 329 participants (mean age: 34.73 years \pm 13.158).

To facilitate recruitment among people with different levels of gambling involvement and alcohol use—non-gamblers, gamblers, and problem gamblers—we recruited participants in three different contexts: undergraduate university courses ($n = 74$), venues for drinking or gambling ($n = 135$; cafés, betting centres, tobacco shops), and health services and support settings ($n = 120$; Alcoholics Anonymous groups, public health services for the treatment of addiction, rehabilitation communities, professional studios, Caritas).

Socio-demographic characteristics of the sample (age, marital status, job status, and educational level), disaggregated for the three contexts, are reported in Table 1. For chi-square computation, some categories were aggregated: separated/divorced and widower for marital status, unemployed/occasional workers and retired for job status. As might be expected, the three subsamples showed significant differences on all characteristics.

Preliminary Methodological Considerations: Assessing Cultural Models

From a cultural and semiotic perspective (Guidi & Salvatore, 2013; Mossi & Salvatore, 2011; Salvatore & Zittoun, 2011), we consider culture as a hierarchical, integrated system of meanings. Indeed, any culture is made up of a particular interweaving of generalized meanings encompassing the whole experience. Generalized meanings can be conceived as a polarity of an oppositional dimension, which we call a dimension of sense: for example, pleasant versus unpleasant, trustworthy versus untrustworthy, familiar versus unfamiliar (Mossi & Salvatore, 2011; Venuleo, 2013). This way of representing generalized meaning is grounded in the recognition of the basic bivalence of meaning (Salvatore, 2013), namely, the fact that meaning is a dichotomic structure: Any affirmation of a quality is at the same time the negation of the opposite quality. Accordingly, culture can be interpreted (and represented) in terms of basic dimensions of sense, and the individual's cultural model can be interpreted as a particular plotting of basic positions on those dimensions of sense (for instance, a combination of the positioning of “trustworthiness” on the “trustworthiness–untrustworthiness” dimension of sense and the positioning of “dependence” on the “dependence–autonomy” dimension of sense). This mode of representing the relationship between culture and cultural models is grounded in an epistemology that recognizes the dynamic interdependence between shared sociocultural forms of thinking and the ways that such forms are expressed by different individuals and groups. Such epistemology can also be recognized within social representations theory. Markova (2000) suggests the concept of *themata* to indicate culturally shared oppositional antinomies underlying popular thinking and grounding social representations of daily life phenomena.

It is worth highlighting that in the current study, we explored the components of cultural models associated with the domain of experience of the micro and macro social environment. The dimensions of sense for this component of the cultural models were investigated through a questionnaire designed to detect the generalized meanings concerning that domain of experience: Interpretation of the Social

Table 1
Socio-Demographic Characteristics of the Sample

Variable	Context modalities	University (<i>n</i> = 74)	Sites for drinking and gambling (<i>n</i> = 135)	Health services and support setting (<i>n</i> = 120)	Total (<i>N</i> = 329)	Significance	
						<i>F</i>	<i>p</i>
Age, <i>M</i> (<i>SD</i>)		22.45 (5.375)	35.97 (12.026)	41.03 (12.684)	34.72 (13.153)	63.61	2/317 <.0001
Gender	Male	8	74	82	164	63.05	2 <.0001
	Female	66	60	38	164		
Marital status	Single	67	72	54	193	44.7	4 ^a <.0001
	Married/Cohabitant	7	54	53	114		
	Separated/Divorced	0	5	11	16		
	Widower	0	1	2	3		
Job status	Student	65	20	7	92	206.8	6 ^b <.0001
	Employee	1	56	29	86		
	Freelancer	1	28	23	52		
	Unemployed/Occasional worker	3	28	50	81		
	Retired	0	2	9	11		
Educational level	No diploma	0	37	58	95	64.34	4 <.0001
	High school diploma	59	65	32	156		
	Post-secondary education/ College/University	15	31	29	75		

Note. Expected frequencies are higher than 20%; no frequencies are less than 1.

^aThe conditions separated/divorced and widower were aggregated for computing chi-square.

^bThe conditions unemployed/occasional worker and retired were aggregated for computing chi-square.

Environment (ISE). The ISE is based on a specific methodology of cultural analysis of psychosocial contexts (markers of organizational development methodology; cf. Carli & Salvatore, 2001; Mannarini, Ciavolino, Nitti, & Salvatore, 2012; Mossi & Salvatore, 2011) and is designed to map the cultural context of a given population and identify cultural models in which the cultural context is expressed. Two features give the questionnaire the power to encourage generalized evaluations, rather than, for instance, prompting circumstantiated reasoning or knowledge (cf. Mossi & Salvatore, 2011). First, the items concern generic objects (e.g., “Italian people,” “Italy”) in accordance with the idea that when the object is proposed in terms of a general class, it is more likely to work as a projective stimulus. Second, these items are associated with a 6-point Likert scale (e.g., “very unreliable,” “quite unreliable,” “a bit unreliable,” “a bit reliable,” “quite reliable,” “very reliable”); therefore, without intermediate alternatives, they were purposely chosen as a way to “force” the answers towards opposite modalities of response.

Instruments

A set of questionnaires was administered to every participant of this study.

Questionnaire on the Interpretation of the Social Environment (ISE; Mossi & Salvatore, 2011). The ISE was used to detect cultural models of the social environment. The items promote the expression of perceptions/opinions/judgements about the micro and macro social context (e.g., evaluations of trustworthiness of one’s residence, reliability of social structures) and of social identity (e.g., moral evaluations of social behaviour). The modalities of response are constructed to serve as bait to capture the general attitude towards the evaluation of the experience. Previous studies (Carli & Salvatore, 2001; Mannarini, et al., 2012) showed good construct validity.

Short form of the UPPS-P Impulsive Behavior Scale (S-UPPS-P; Billieux et al., 2012). This is a 20-item questionnaire based on the UPPS-P model (Whiteside & Lynam, 2001). According to this model, five distinct components of impulsivity are assessed (Cyders & Smith, 2007): sensation seeking, lack of premeditation, lack of perseverance, negative urgency, and positive urgency. Each facet is evaluated by four items on a 4-point Likert scale. The S-UPPS, initially developed in French (Billieux et al., 2012) and then adapted to English (Cyders, Littlefield, Coffey, & Karyadi, 2014), Spanish (Cándido, Orduña, Perales, Verdejo-Garcia, & Billieux, 2012), and Italian (D’Orta et al., 2015), validated the five-factor structure hypothesized to underlie the UPPS Impulsive Behavior Scale. The only study on the Italian short version of the UPPS-P (D’Orta et al., 2015) was conducted on 188 volunteers recruited through e-mail invitations and advertisements posted in Italian Facebook groups and Italian health-related forums.

Short Beck Depression Inventory (S-BDI; Beck, Rial, & Rickels, 1974). This is a 13-item form of the original BDI (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) that assesses the severity of depression. The usefulness of the BDI has been repeatedly

demonstrated, as evidenced by its widespread clinical use, as well as for its use in outcome studies of psychotherapy and antidepressant treatment. Previous studies have used the S-BDI to assess depression among hazardous gamblers (Bonnaire, Bungener, & Varescon, 2009) and drinkers (Huurre, Aro, & Rahkonen, 2003; Korneich et al., 2011) and to support the use of the short form as a reliable and valid brief screening measure of depression and for research purposes (Reynolds & Gould, 1981). However, no Italian validation of the instrument exists.

Alcohol Use Disorders Identification Test (AUDIT; Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). This is one of the most accurate screening tests used for the early identification of hazardous and harmful alcohol use. It consists of 10 items: three regarding quantity and frequency of alcohol use, three about alcohol dependence, and four about problems derived from its use during the past year. A variety of studies in many settings and nations support AUDIT's reliability and validity (Babor et al., 2001) and an Italian version has been used in different studies (Agabio, Marras, Gessa, & Carpinello, 2007; Strunin et al., 2010), but no Italian validation of the instrument exists.

Problem Gambling Severity Index (PGSI; Ferris & Wynne, 2001). The PGSI is considered a continuous (rather than dichotomous) scale of problem gambling severity and was designed specifically for use with the general population. The instrument is part of a larger battery, the Canadian Problem Gambling Index, originally developed by Ferris and Wynne (2001) and consists of nine items on scales ranging from 0 (*never*) to 3 (*almost always*). It asks respondents, within a 12-month time frame, to rate how frequently they engaged in various problem gambling behaviours. The PGSI demonstrated good internal consistency ($\alpha = .84$) and good criterion-related validity because it matches fairly well with the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.) and the South Oaks Gambling Screen, correlating at .83 with both measures (Ferris & Wynne, 2001). A study by Barbaranelli, Vecchione, Fida, and Podio-Guidugli (2013) on a sample of gamblers confirms the internal validity, reliability, and concurrent validity of the Italian version of the PGSI.

Procedure

In all contexts, the questionnaires were administered individually. In accordance with the ethical code of the Italian Psychology Association (<http://www.aipass.org/node/11560>) and the Italian Code on the protection of personal data (Legislative decree No 196/2003), the participants were informed about the general aim of the research, the voluntary nature of participation, and the anonymity of responses. In the case of rehabilitation communities and of the Alcoholics Anonymous self-help group, this presentation was made by the research group at the opening of a weekly meeting. After that, consent for an information session was obtained through the contact person in each group. In the case of the public health services for the treatment of addiction SerD, the users gave consent to the therapist before being contacted for the interview.

In all support settings (SerD, Alcoholics Anonymous, rehabilitation communities) the questionnaires were administered in a room made available by the service. In the case of students, participation was requested collectively, before the lecture started; an appointment was booked for each student and the instruments were administered in an office in the researchers' department. The same office was used for the administration of questionnaires to subjects recruited in cafés and in non-specific contexts, such as streets, parks, and squares, after their agreement was obtained. No incentive was given.

Data Analysis

Data analysis was carried out in different steps.

Confirmatory factor analysis (CFA). Given the limits highlighted above (see the Instruments subsection), CFAs were run on all the instruments, with the aim of testing whether their original factor structure fit the hypothesized measurement model in our sample. The factor scores detected through confirmatory analysis were used for the subsequent analysis.

Detection of cultural models. Consistent with the suggestion that culture, as a complex phenomenon (Batista-Foguet, Mendoza, Pérez-Perdigón, & Rius, 2000), requires the recognition of the interdependency of all the survey variables, the responses of the general sample ($N = 329$) to ISE were put through multiple correspondence analysis (MCA; Lebart, Morineau, & Warwick, 1984). MCA is a non-parametric analysis technique that allows one to sum up the relations observed among nominal or ordinal data by using a limited number of factorial dimensions (Blasius & Greenacre, 1998). Each factorial dimension describes the opposition between two patterns of co-occurring response modalities across respondents. It is worth pointing out that the modalities co-occurring on a factorial polarity concern aspects that have no functional or semantic relationship; therefore, their aggregation can be interpreted as the effect of a latent generalized meaning linking the response modalities independently from their specific content (i.e., relationship with family, friends, service, norms; Mossi & Salvatore, 2011). We focused on the first three factorial dimensions (henceforth: ISE1, ISE2, ISE3) extracted by MCA, as they explained the largest proportion of the data matrix inertia. We adopted the subjects' scores (factor coordinates), which allow the position of each respondent on the three factorial dimensions to be identified and which were used as measurements of their cultural models. The greater the similarity between the respondent's response profile and the profile characterizing the factorial dimension, the higher the respondent's score on that factor or dimension of sense.

Influence of cultural models and other predictive variables on addictions. Multilevel regression models (mixed models) were applied to detect the influence on addictions of cultural models, impulsivity, and depression separately and in interaction with each other. We chose this model because it allowed two levels of analysis to be considered: (a) the participant's answers to questionnaires and (b) the context in which the participant was recruited. The source of variability related to

the context was treated as a co-variate to remove it from general error. In conducting the multilevel regression analyses, we used a model-building technique. Specifically, we first fit a model in which only cultural models—detected through ISE factor coordinates—were included (simple model), and then if one or more components of the cultural models were significant, all other variables were included (Model 1). This allowed us to observe any change in the parameter estimates and corresponding standard errors when interactions between cultural models and the other variables, both statistically significant at the $\alpha = .05$ level, were inserted (Model 2). To test whether Model 2 (with interactions) fit significantly better than Model 1 (without interactions), we used the deviance difference test (or likelihood ratio test; Hox, Moerbeek, & van de Schoot, 2010). It consists of comparing the likelihood of the two models (Model 1 and Model 2) by looking at the difference in their logarithms (to see more, please refer to Hox et al., 2010).

Since AUDIT and PGSI scores are generally non-Gaussian, a bootstrap technique was used to further estimate the statistical significance of the values observed (Efron & Tibishirani, 1993).

Results

Confirmatory Factor Analysis

The original factor structure of all instruments was identified through confirmatory analysis: a single-factor structure for the S-BDI (fit index: comparative fit index (CFI) = .926; Tucker-Lewis index (TLI) = .912; standardized root mean square residual (SRMR) = .045; Cronbach's alpha = .876), a five-factor structure (negative urgency, positive urgency, lack of premeditation, lack of perseverance, and sensation seeking) for the S-UPPS-P (CFI = .924, TLI = .909, SRMR = .06), and a single-factor structure for AUDIT (CFI = .965; TLI = .947; SRMR = .03; Cronbach's alpha = .918) and PGSI (CFI = .977; TLI = .954; SRMR = .023; Cronbach's alpha = .893). The composition of the S-UPPS-P subscales was as follows: negative urgency: Items 6, 8, 13, and 15 (Cronbach's alpha = .784); positive urgency: Items 3, 10, 17, and 20 (Cronbach's alpha = .837); lack of premeditation: Items 2, 5, 12, and 19 (Cronbach's alpha = .874); lack of perseverance: Items 1, 4, 7, and 11 (Cronbach's alpha = .881); and sensation seeking: Items 9, 14, 16, and 18 (Cronbach's alpha = .711). Items 13 and 15 were aggregated, as were Items 16 and 18, in order to increase indices of fitness and to obtain a better estimate of the measure.

To improve the measurement model, we eliminated items that reduced the parameters of fitness in the questionnaires. Items 1–3 were dropped for AUDIT, as they concern the frequency and the quantity of alcohol use, whereas the items retained concern aspects related to alcohol dependence and problems derived from alcohol use during the past year. Items 1, 6, 8, and 9 were dropped for PGSI, as they concern gambling-related health, financial and family problems, and sense of guilt, whereas the items retained concern gambling tolerance, losing and chasing, borrowing money, awareness of problems, and criticisms from other people.

Dimensions of Cultural Models

After applying the Benzécri formula of inertia adjustment (Benzécri, 1973), we found that the first factorial dimension of the ISE (ISE1) accounted for 35.26% of the inertia, the second dimension (ISE2) accounted for 13.73%, and the third dimension (ISE3) accounted for 7.82%. On the whole, these three factorial dimensions accounted for 56.81% of the total inertia expressed. Appendices A, B, and C show the most significant response modalities characterizing ISE1, ISE2, and ISE3 polarities, respectively. Henceforth, we use capitals for labelling the dimensions of sense and italics for the interpretation of polarities.

ISE1. Models of evaluation of the social environment: Moderation versus reactivity.

This dimension opposes two response patterns that we interpret as markers of two particular ways of perceiving and evaluating the social environment. On the *Moderation* polarity (–), responses adopting intermediate points on the Likert scales (i.e., quite agree, quite reliable) are aggregated. There is a positive image of the environment (i.e., people and services are perceived as reliable), although some critical aspects are perceived (i.e., respondents feel worried and pessimistic about the future). On the *Reactivity* polarity (+), responses adopting the extremes on the Likert scales (e.g., *very much, not at all*) are aggregated; the social environment is perceived in black and white.

ISE2. Relation with the social environment: Unrepresentability versus retreat.

This dimension of sense opposes two ways in which people relate within their context. For *Unrepresentability* (–), missing answers co-occur to characterize this polarity. The “un-answers” refer to questions connected to relationships with the micro and macro social environment, for instance, how subjects perceive Italians, their colleagues, their friends, their family. Thus, it is reasonable that the “un-answer” is not simply an absence of response, but information on a certain attitude towards certain fields of experience, which does not appear to be representable for the respondents positioned along this polarity (for a similar interpretation of the missing answers, see Salvatore, Mannarini, & Rubino, 2004). On the *Retreat* polarity (+), an opposing interpretation of the macro and micro social context is offered. On the one hand, the macro social context is depicted as an anomic scenario: Institutions are not reliable and all the problems in Italy are due to incompetence and inefficiency; Italians are desperate and resigned. On the other hand, the micro social context is depicted as an oasis: Family, friends, and colleagues are perceived as competent, reliable, and influential.

ISE3. Reaction to the social environment: Sense of belonging versus disaffection.

This dimension represents the way people interact with their social world, in particular how they react to it. On the *Sense of belonging* polarity (–), the responses signal a positive attitude towards the social environment: People are glad to belong to Italy and to their local territory; institutions, from police to health services, seem reliable; Italians are perceived as optimistic and trustworthy; the territory is bound to improve, and everyone can collaborate in achieving this through studying, working, following the rules, and so on. On the *Disaffection* polarity (+), the responses

indicate an uninvolved, detached reaction to the social environment: People do not feel a bond with their town or with Italy and Europe; both the macro and micro social context are perceived as unreliable, incapable, incompetent, and inefficient; and the territory is doomed not to develop in the future.

Table 2 shows the ISE, S-UPPS-P, and S-BDI means associated with the recruitment contexts. Significant differences were found on all measures of interest.

Effects and Moderating Role of Cultural Models

In the following paragraphs, the results of mixed models are presented, sorted by behaviour. A bootstrap 95% confidence interval resulting from 5,000 resamples with replacement (Efron & Tibishirani, 1993) is reported in the tables. Bootstrap estimates relate to the measure of interest and their interaction proved to be stable.

Alcohol. The simple model shows a significant positive influence of ISE1 (*Models of evaluation of social environment*) (Table 3): The more that people evaluate their social environment in an absolute way (positive polarity of ISE1), the more they drink harmfully. The random intercept was not significant (Wald $Z = .901$): The effects of models of evaluation of the social environment (ISE1) on addictions showed no significant difference in the contexts considered.

In the second phase, impulsivity and depression were inserted in the model. The parameters show that the three factors of impulsiveness relate to hazardous drinking (Table 4; likelihood ratio test = 73.5, $df = 6$, $p < .001$).

Lack of perseverance and sensation seeking show a positive association: When the scores on these scales rise, the score on alcohol rises, too. On the other hand, there is a negative association with premeditation. Furthermore, depression proves to have a significant association with AUDIT scores: Those with higher scores on the S-BDI generally scored higher on the problem drinking scale. It is worth noticing that when the variables were entered, ISE1 retained its significance. Furthermore, the model shows a significant negative influence of ISE3 (*Reaction to social environment*): The more that people show a sense of belonging (negative polarity of ISE3), the more they drink harmfully. For this model, the random intercept was not significant (Wald $Z = .713$).

The last step entailed considering the interaction between the measures of interest (Table 5; likelihood ratio test = 16.6, $df = 1$, $p < .001$). As a result of the interaction input, the variables of the previous model that maintained their significance were ISE1, ISE3, sensation seeking, and depression. There was a significant positive interaction between ISE1 and depression scores (Figure 1): The more depressed people are and the more they evaluate their social environment in absolute terms, the more likely they are to drink harmfully. Furthermore, there is a significant negative interaction between ISE2 and depression: The higher people are on the *Retreat* polarity, the less likely they are to engage in hazardous drinking. Finally, depression proved to have a significant positive

Table 2
ISE, S-UPPS-P, and S-BDI Means (SDs) Associated With the Recruitment Contexts

Variable	Sites for drinking and gambling			Health services and support setting			Significance	
	University	Health services and support setting	Total	F	df	p		
ISE1	-0.29 (0.227)	0.09 (0.529)	-0.005 (0.479)	18.87	2/326	<.0001		
ISE2	0.039 (0.252)	0.111 (0.337)	0.009 (0.371)	13.96	2/326	<.0001		
ISE3	-0.046 (0.332)	0.064 (0.315)	0.007 (0.340)	3.38	2/326	<.05		
Negative urgency (S-UPPS-P)	0.367 (0.802)	-0.295 (0.728)	-0.009 (0.786)	20.23	2/318	<.0001		
Lack of perseverance (S-UPPS-P)	0.518 (1.005)	-0.338 (0.565)	0.000 (0.865)	27.48	2/318	<.0001		
Lack of premeditation (S-UPPS-P)	0.409 (0.801)	-0.268 (0.477)	0.000 (0.676)	28.34	2/318	<.0001		
Sensation seeking (S-UPPS-P)	0.348 (0.715)	-0.237 (0.59)	-0.005 (0.677)	20.22	2/318	<.0001		
Positive urgency (S-UPPS-P)	0.399 (0.772)	-0.284 (0.565)	-0.004 (0.692)	28.02	2/318	<.0001		
Depression (S-BDI)	-0.069 (0.349)	-0.09 (0.453)	-0.013 (0.460)	6.97	2/320	.001		

Note. ISE1, first factorial dimension of the Interpretation of the Social Environment questionnaire; ISE2, second factorial dimension of the Interpretation of the Social Environment questionnaire; ISE3, third factorial dimension of the Interpretation of the Social Environment questionnaire; S-UPPS-P, short form of the UPPS-P Impulsive Behavior Scale; S-BDI, Short Beck Depression Inventory.

Table 3
Parameters of Simple Model for Alcohol

Parameter	Estimate	SE	df	t	Significance	95% Confidence interval		Bootstrap 95% confidence interval ^a	
						Lower bound	Upper bound	Lower bound	Upper bound
Intercept	-0.026	0.080	2.814	-0.327	0.766	-0.292	0.239	-0.100	.055
ISE1 ^b	0.268	0.084	303.508	3.182	0.002	0.102	0.433	.058	.484
ISE2 ^c	-0.222	0.118	315.739	-1.878	0.061	-0.454	0.011	-.624	.009
ISE3 ^d	-0.063	0.115	316.267	-0.547	0.585	-0.288	0.163	-.335	.223
Random effect									
Residual	0.471	0.038		Wald Z	0.000	0.403	0.551	.308	.616
Intercept	0.015	0.016		0.901	0.368	0.002	0.129	.000	.049

Note. ISE1, first factorial dimension of the Interpretation of the Social Environment questionnaire; ISE2, second factorial dimension of the Interpretation of the Social Environment questionnaire; ISE3, third factorial dimension of the Interpretation of the Social Environment questionnaire.

^a Bootstrap results are based on 5,000 bootstrap samples

^b Models of evaluation of the social environment: moderation (-) versus reactivity (+)

^c Relation with social environment: unrepresentability (-) versus retreat (+)

^d Reaction to social environment: sense of belonging (-) versus disaffection (+)

Table 4
Parameters of Model 1 (All Predictive Variables) for Alcohol

Parameter	Estimate	SE	df	T	Significance	95% Confidence interval		Bootstrap 95% confidence interval ^a	
						Lower bound	Upper bound	Lower bound	Upper bound
Intercept	-0.019	0.063	2.156	-0.305	0.787	-0.271	0.233	-0.086	.053
ISE1 ^b	0.172	0.076	280.884	2.260	0.025	0.022	0.321	-0.004	.357
ISE2 ^c	-0.156	0.107	314.624	-1.457	0.146	-0.368	0.055	-0.421	.034
ISE3 ^d	-0.379	0.110	316.393	-3.448	0.001	-0.595	-0.163	-0.645	-.083
Negative urgency (S-UPPS-P)	0.125	0.181	313.095	0.689	0.492	-0.232	0.482	-0.411	.638
Lack of premeditation (S-UPPS-P)	0.357	0.168	316.836	2.132	0.034	0.028	0.687	-0.023	.767
Lack of perseverance (S-UPPS-P)	-0.683	0.292	316.817	-2.336	0.020	-1.258	-0.108	-1.386	-.041
Sensation seeking (S-UPPS-P)	0.283	0.126	313.058	2.246	0.025	0.035	0.531	-0.034	.615
Positive urgency (S-UPPS-P)	-0.099	0.304	316.154	-0.327	0.744	-0.698	0.499	-0.948	.795
Depression (S-BDI)	0.703	0.086	316.858	8.147	0.000	0.534	0.873	.449	.924
Random effect				Wald Z					
Residual	0.374	0.030		12.507	0.000	0.320	0.438	.239	.483
Intercept	0.008	0.011		0.713	0.476	0.001	0.125	.000	.035

Note. ISE1, first factorial dimension of the Interpretation of the Social Environment questionnaire; ISE2, second factorial dimension of the Interpretation of the Social Environment questionnaire; ISE3, third factorial dimension of the Interpretation of the Social Environment questionnaire. S-UPPS-P, short form of the UPPS-P Impulsive Behavior Scale; S-BDI, Short Beck Depression Inventory.

^a Bootstrap results are based on 5,000 bootstrap samples

^b Models of evaluation of the social environment: moderation (-) versus reactivity (+)

^c Relation with social environment: unrepresentability (-) versus retreat (+)

^d Reaction to social environment: sense of belonging (-) versus disaffection (+)

Table 5
Parameters of Model 2 (All Predictive Variables and Interactions) for Alcohol

Parameter	Estimate	SE	df	T	Significance	95% Confidence interval		Bootstrap 95% confidence interval ^a	
						Lower bound	Upper bound	Lower bound	Upper bound
Intercept	-0.053	0.074	2.624	-0.710	0.536	-0.310	0.204	-0.123	.019
ISE1 ^b	0.150	0.078	305.007	1.940	0.053	-0.002	0.303	-0.034	.347
ISE3 ^c	-0.285	0.108	316.866	-2.652	0.008	-0.497	-0.074	-0.552	-0.008
Sensation seeking (S-UPPS-P)	0.123	0.055	311.303	2.219	0.027	0.014	0.231	.005	.243
Depression (S-BDI)	0.520	0.098	316.797	5.307	0.000	0.327	0.712	.297	.739
Sensation seeking(S-UPPS-P) * ISE1	-0.048	0.103	316.949	-0.467	0.641	-0.251	0.155	-0.269	.132
Depression (S-BDI) * ISE1	0.425	0.152	314.180	2.801	0.005	0.126	0.723	.144	.772
Depression (S-BDI) * ISE2	-0.620	0.221	313.495	-2.808	0.005	-1.055	-0.186	-1.639	-0.144
Lack of perseverance (S-UPPS-P) * Depression (S-BDI)	-0.419	0.155	314.017	-2.710	0.007	-0.724	-0.115	-0.801	-0.028
Sensation seeking (S-UPPS-P) * Depression (S-BDI)	0.512	0.170	313.935	3.001	0.003	0.176	0.847	.053	.883
Random effect				Wald Z					
Residual	0.354	0.028		12.519	0.000	0.303	0.414	.214	.474
Intercept	0.013	0.014		0.878	0.380	0.001	0.118	.000	.042

Note. ISE1, first factorial dimension of the Interpretation of the Social Environment questionnaire; ISE2, second factorial dimension of the Interpretation of the Social Environment questionnaire; ISE3, third factorial dimension of the Interpretation of the Social Environment questionnaire. S-UPPS-P, short form of the UPPS-P Impulsive Behavior Scale; S-BDI, Short Beck Depression Inventory.

^a Bootstrap results are based on 5,000 bootstrap samples

^b Models of evaluation of the social environment: moderation (-) versus reactivity (+)

^c Reaction to social environment: sense of belonging (-) versus disaffection (+)

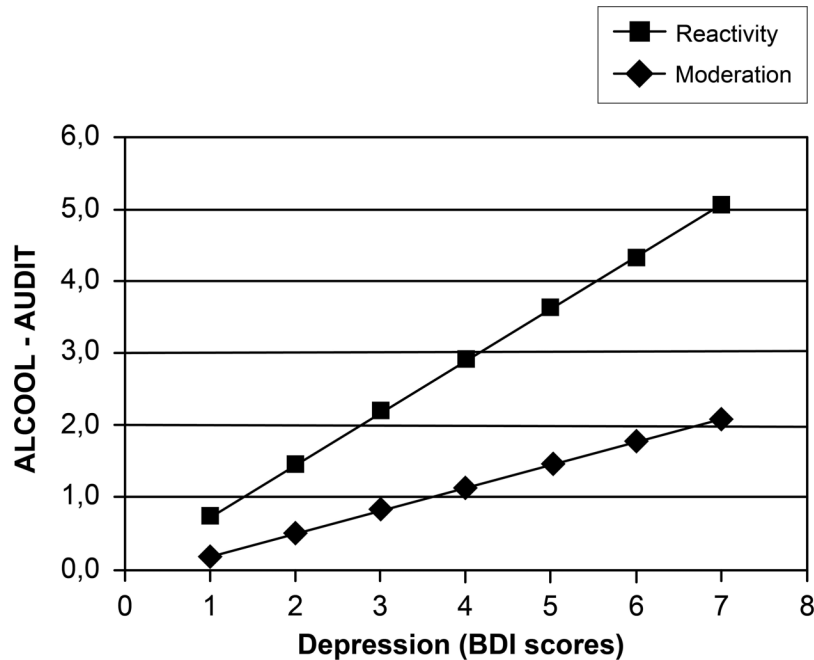


Figure 1. Simple slope of interaction between models of evaluation of the social environment (ISE1) and Short Beck Depression Inventory (S-BDI) on Alcohol Use Disorders Identification Test (AUDIT).

interaction with sensation seeking and a significant negative interaction with lack of premeditation. The random intercept for this model was not significant (Wald $Z = .878$).

Gambling. ISE1 and ISE2 appear to be related to gambling (Table 6). In particular, ISE1 is positively correlated to gambling. As is the case for alcohol, a reactive evaluation of the environment is associated with a higher probability of harmful gambling. ISE2 is negatively associated with gambling; thus, the more people's social environment is *unrepresentable*, the more they gamble harmfully. The random effect was not significant (Wald $Z = .157$), which means the effects of cultural models on harmful behaviours show no significant differences in the contexts considered.

When entering the other predictive variables, the effect of ISE1 remained stable, and ISE2 was no longer associated with hazardous gambling (Table 7; likelihood ratio test = 29.8, $df = 6$, $p < .001$). Furthermore, the analysis shows that a dimension of impulsivity—sensation seeking—and depression are related to gambling. The higher the score on the sensation-seeking scale and on the depression scale, the higher the score on problem gambling. The random intercept was not significant (Wald $Z = .369$).

In order to explore the moderation of cultural models, we entered the interactions between the measures of interest (Table 8; likelihood ratio test = 12.7, $df = 5$, $p < .05$). Following the input of interaction, the variables that proved to be related to PGSI scores were ISE1 and sensation seeking. Furthermore, these variables appear to be related to a significant degree (Figures 2 and 3): The more absolute the evaluation of the social environment and the more that people “seek strong

Table 6
Parameters of Simple Model for Gambling

Parameter	Estimate	SE	df	t	Significance	95% Confidence interval		Bootstrap 95% confidence interval ^a	
						Lower bound	Upper bound	Lower bound	Upper bound
Intercept	-0.002	0.023	1.507	-0.098	0.933	-0.142	0.137	-0.045	.042
ISE1 ^b	0.147	0.044	185.304	3.338	0.001	0.060	0.235	.022	.275
ISE2 ^c	-0.151	0.063	191.505	-2.405	0.017	-0.276	-0.027	-.373	-.007
ISE3 ^d	0.041	0.062	301.465	0.660	0.510	-0.081	0.163	-.173	.235
Random effect				Wald Z					
Residual	0.137	0.011		12.300	0.000	0.116	0.160	.074	.198
Intercept	0.000	0.002		0.157	0.875	0.000	74.837	.000	.006

Note. ISE1, first factorial dimension of the Interpretation of the Social Environment questionnaire; ISE2, second factorial dimension of the Interpretation of the Social Environment questionnaire; ISE3, third factorial dimension of the Interpretation of the Social Environment questionnaire.

^a Bootstrap results are based on 5,000 bootstrap samples.

^b Models of evaluation of the social environment: moderation (-) versus reactivity (+).

^c Relation with social environment: unrepresentability (-) versus retreat (+). ^d Reaction to social environment: sense of belonging (-) versus dissatisfaction (+).

Table 7
Parameters of Model 2 (All Predictive Variables) for Gambling

Parameter	Estimate	SE	df	t	Significance	95% Confidence interval		Bootstrap 95% confidence interval ^a	
						Lower bound	Upper bound	Lower bound	Upper bound
Intercept	-0.003	0.028	1.298	-0.108	0.928	-0.210	0.204	-0.044	.041
ISE1 ^b	0.128	0.043	210.494	2.971	0.003	0.043	0.214	.016	.252
ISE2 ^c	-0.105	0.062	279.974	-1.699	0.091	-0.228	0.017	-.316	.022
ISE3 ^d	-0.020	0.063	288.354	-0.320	0.749	-0.145	0.105	-.242	.176
Negative urgency (S-UPPS-P)	0.110	0.105	301.780	1.045	0.297	-0.097	0.317	-.123	.334
Lack of premeditation (S-UPPS-P)	-0.033	0.096	305.121	-0.338	0.735	-0.222	0.157	-.185	.146
Lack of perseverance (S-UPPS-P)	0.075	0.169	307.855	0.446	0.656	-0.257	0.407	-.262	.361
Sensation seeking (S-UPPS-P)	0.205	0.073	302.820	2.806	0.005	0.061	0.350	.034	.410
Positive urgency (S-UPPS-P)	-0.272	0.176	307.755	-1.542	0.124	-0.619	0.075	-.669	.139
Depression (S-BDI)	0.168	0.050	300.651	3.379	0.001	0.070	0.266	.032	.299
Random effect				Wald Z					
Residual	0.124	0.010		12.277	0.000	0.105	0.145	.065	.178
Intercept	0.001	0.003		0.369	0.712	0.000	0.205	.000	.008

Note. ISE1, first factorial dimension of the Interpretation of the Social Environment questionnaire; ISE2, second factorial dimension of the Interpretation of the Social Environment questionnaire; ISE3, third factorial dimension of the Interpretation of the Social Environment questionnaire. S-UPPS-P, short form of the UPPS-P Impulsive Behavior Scale; S-BDI, Short Beck Depression Inventory.

^a Bootstrap results are based on 5,000 bootstrap samples

^b Models of evaluation of the social environment: moderation (-) versus reactivity (+)

^c Relation with social environment: unrepresentability (-) versus retreat (+)

^d Reaction to social environment: sense of belonging (-) versus disaffection (+)

Table 8
Parameters of Model 2 (All Predictive Variables and Interactions) for Gambling

Parameter	Estimate	SE	df	t	Significance	95% Confidence interval		Bootstrap 95% confidence interval ^a	
						Lower bound	Upper bound	Lower bound	Upper bound
Intercept	-0.017	0.032	1.988	-0.538	0.645	-0.155	0.121	-0.058	.028
ISE1 ^b	0.146	0.044	259.031	3.328	0.001	0.060	0.232	.011	.288
Sensation seeking (S-UPPS-P)	0.131	0.031	270.783	4.187	0.000	0.070	0.193	.060	.210
Sensation seeking (S-UPPS-P) * ISE1	0.183	0.058	307.948	3.151	0.002	0.069	0.297	.012	.373
Sensation seeking (S-UPPS-P) *	0.204	0.067	304.559	3.067	0.002	0.073	0.335	-.020	.395
Depression (S-BDI)									
Random effect				Wald Z					
Residual	0.122	0.010		12.317	0.000	0.104	0.143	.066	.181
Intercept	0.002	0.003		0.577	0.564	0.000	0.052	.000	.009

Note. ISE1, first factorial dimension of the Interpretation of the Social Environment questionnaire. S-UPPS-P, short form of the UPPS-P Impulsive Behavior Scale; S-BDI, Short Beck Depression Inventory.

^a Bootstrap results are based on 5,000 bootstrap samples

^b Models of evaluation of the social environment: moderation (-) versus reactivity (+)

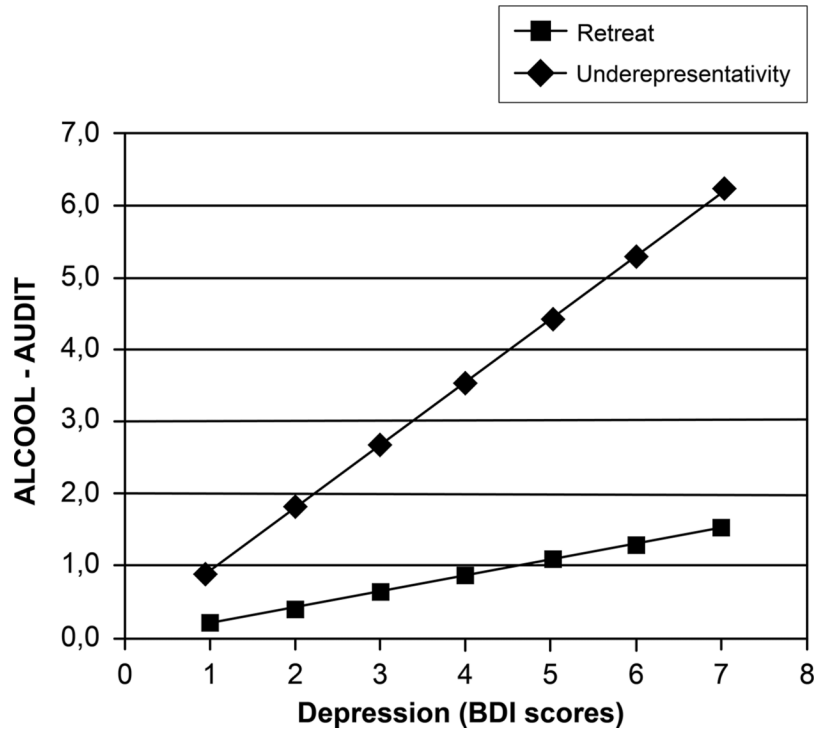


Figure 2. Simple slope of interaction between the relationship with social environment (ISE2) and Short Beck Depression Inventory (S-BDI) on Alcohol Use Disorders Identification Test (AUDIT).

sensations,” the more likely they are to engage in hazardous gambling. There is also a significant positive interaction between sensation seeking and depression. For this model, too, the random intercept was not significant (Wald $Z = .577$).

Discussion

In the present study, we examined the relationship among impulsivity, depression, cultural models, and hazardous drinking and gambling. Consistent with Hypothesis a (a positive association between impulsivity and target hazardous behaviours), a specific factor of impulsivity—sensation seeking—proved to have a significant connection with both hazardous drinking and hazardous gambling. According to the theory of sensation seeking proposed by Zuckerman (1979, 1994), people with high scores on sensation seeking have a strong need for varied and intense stimulation; previous studies, in agreement with this theory, showed that individuals who seek intense and possibly novel forms of sensation are more likely to develop problems with drinking (Adams, Kaiser, Lynam, Charnigo, & Milich, 2012; Connors & Sobell, 1986; Simons, Gaher, Correia, Hansen, & Christopher, 2005) and gambling (Cyders & Smith, 2008; Fortune & Goodie, 2010; Nower et al., 2004; Powell, Hardoon, Derevensky, & Gupta, 1999). However, results on the association between the different impulsiveness traits of the UPPS model and gambling and drinking problems are not conclusive, since different traits of impulsiveness appear to be related to these hazardous behaviours in different studies (Whiteside & Lynam, 2003). For instance, Smith and colleagues (2007), in a study with undergraduate students, found that

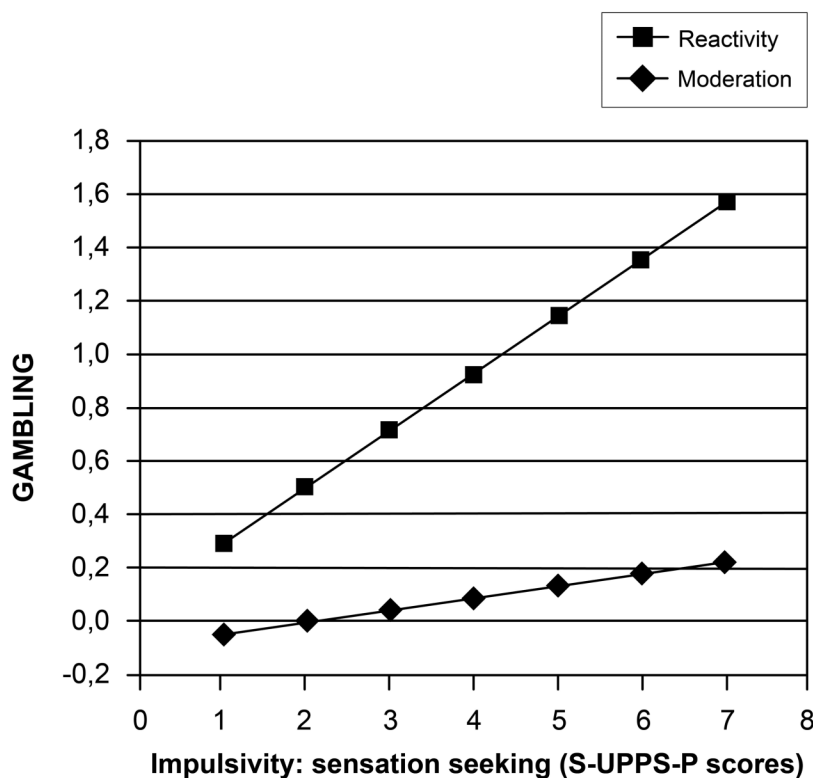


Figure 3. Simple slope of interaction between models of evaluation of the social environment (ISE1) and Impulsive Behaviour Scale – Sensation Seeking (S-UPPS-P) on the Problem Gambling Severity Index (PGSI).

sensation seeking was associated with the frequency of engaging in risky behaviours (including drinking and gambling), whereas urgency was related to problem levels of involvement in those behaviours. Cyders and Smith (2008) found that that positive urgency, lack of planning, and sensation seeking all related to both gambling behaviour and general risky behaviour (e.g., mountain climbing) cross-sectionally in a sample of college students, but only positive urgency predicted longitudinal increases in gambling behaviour. The study by Verdejo-García, Bechara, Recknor, and Pérez-García (2007) of 36 individuals with substance dependence (including alcohol) and 36 drug-free controls revealed that those with substance dependence show high scores on dimensions of urgency, lack of perseverance, and lack of premeditation, but not on sensation seeking. Differences in the sample (i.e., country, race, education levels, age) and design (i.e., cross-sectional vs. longitudinal) of these studies may explain these differences in results. For instance, some scholars have suggested that age differences may explain differences in the role of urgency in hazardous behaviours (Canale, Vieno, Griffiths, Rubaltelli, & Santinello, 2015; Whiteside & Lynam, 2003).

With regard to Hypothesis b, the expected association between depression and hazardous behaviours was confirmed. Depression, both alone and in interaction with sensation seeking, was shown to have a significant relation to hazardous drinking. The results are consistent with the findings from previous studies. The literature

suggests that alcoholics with coexisting depression exhibit heavier alcohol abuse, severer physical damage, and greater vulnerability to both psychotropic drug abuse and overdose behaviour than do non-depressive alcoholics (Burke, Oberklaid, & Burgess, 2004; Hall, 2012). Furthermore, it was suggested that people with depression may engage in problem drinking in part because negative affect is detrimental to their ability to control impulsive behaviour (Cyders & Smith, 2008). Based on the results of our study, depression is not directly associated with gambling, but is associated with it when in interaction with sensation seeking. This finding deserves comment. Although the direction of causality has not been established, the association between gambling and depression was suggested by previous research studies (Griffiths & Wood, 2000; Gupta & Derevensky, 1998; Lynch et al., 2004), as well as by clinical reports in which gambling is seen as a defence against depression (Blaszczynski et al., 1986) or a coping strategy to deal with depression and/or anxiety. However, gamblers are not a homogeneous group (Zimmermann, Meeland, & Krug, 1985). It may well be that differences in personality traits and environmental factors (i.e., exposure to stressful circumstances, stigmatization) weigh differently in depression, thereby accounting for the discordant findings among studies. The findings of our study reveal, for instance, a significant interaction between depression and impulsivity-sensation seeking. This means that, although depression appears not to have a direct effect on hazardous gambling, it may favour hazardous gambling in people in search of intense sensations and ready to take physical and social risks for the sake of such experiences. Previous studies reveal the role of impulsivity traits in mediating the relationship between depression and hazardous gambling (Clarke, 2006; Dussault, Brendgen, Vitaro, Wanner, & Tremblay, 2011). Further research is needed to examine this issue in greater depth.

With regard to cultural models, we have suggested that the way people interpret their social environment may play a major role in their engagement in hazardous drinking and gambling and in moderating the impact of their levels of impulsivity and depression. Analysis has shown that different cultural models are associated with different probabilities of each of the hazardous behaviours investigated. More specifically, they have shown that the component related to the social environment evaluation model (ISE1) affects the probability of both hazardous drinking and hazardous gambling. The individuals tending to adopt the *Reactivity* cultural polarity are more prone to drink harmfully and to gamble: Heavy drinkers and gamblers perceive their world as an extremely anomic environment. One can see that reactivity corresponds to a highly negative connotation of the social environment, perceived as an extremely anomic place where people cannot trust anybody, and even institutions, politics, and public services appear to be unreliable; there is no faith in the future and the present is the only representable experience. The findings are consistent with previous studies that used the ISE questionnaire (Venuleo, Calogiuri, & Rollo, 2015; Venuleo et al., 2016; Venuleo, Salvatore, & Mossi, 2015): Hazardous gamblers and hazardous drinkers, compared with a control group, were found to have a negative attitude towards the social environment, characterized by highly negative connotations. One possible way of interpreting the result is that such

a bad view of the social environment fuels negative affect (stress, loneliness, helplessness, and other intolerable feelings) and the need to indulge in gambling and drinking as a way to escape from feelings and situations that are felt to be unbearable. This view is consistent with clinical reports and several influential theoretical models (e.g., stress-coping model, Wills & Shiffman, 1985; self-medication model, Khantzian, 1997) that underline the important role played by negative affect in promoting hazardous behaviour (gambling: Blaszczynski & McConaghy, 1989; Gupta et al., 2004; Rosenthal, 1986; hazardous drinking: Holahan et al., 2001; Leigh, 1989) but stresses that the social environment can constitute a source of malaise and negative feeling (Borrell & Boulet, 2005). Another compatible hypothesis is that the view of the social environment affects the assessment of risks related to the behaviour (Venuleo, Mossi, & Marinaci, 2017) and identification with the community's values and norms. Research has extensively suggested that social trust facilitates social control through commitment to the community's values and norms. In the same vein, if social trust erodes, people will be less likely to identify with the rules in their own conduct (Rahn & Transue, 1998; Rotter, 1980) and more likely to adopt risky behaviours (Åslund & Nilsson, 2013; McPherson et al., 2013). Ahnquist, Lindström, and Wamala (2008), in analysing data from the 2006 Swedish National Survey of Public Health, showed that low institutional trust was associated with an increased risk of harmful alcohol consumption. The authors suggest that distrust in society may contribute to the lack of positive lifestyle behaviours.

The results also show the significant relationship between ISE3 (reaction to social environment) and hazardous drinking: Subjects tending to express a *Sense of belonging* to the country where they live are also more prone to problem drinking. This result is not obvious, but it is at any rate understandable. On the one hand, previous studies have connected problem drinking to psychosocial factors such as loneliness and feelings of alienation (Paluoso, 2000; Rostosky, Owens, Zimmerman, & Riggle, 2003), which one can expect to be associated with disaffection more than with a sense of belonging. On the other hand, some authors have suggested that drinking might favour social grouping, respond to affiliation needs, and be a means to define oneself as part of a subculture. For instance, the in-depth ethnographic fieldwork of West (2001) shows that in two American subcultures, the fraternity and the U.S. Navy, which are noteworthy for alcohol use, drinking males create a masculine "in-group" that defines what masculinity means to the group and favours group cohesion. The anthropological study of the day-to-day lifestyle of skinheads living in Perth (Australia) conducted by Moore (1994) shows the significance of drinking for skinhead group affiliation and personal identity. Other studies have suggested that people's drinking may be related to self-pressure to conform to group norms in order to gain social approval and facilitate social interaction (see Petraitis, Flay, & Miller, 1995). From this perspective, drinking may serve the sense of belonging to a group, rather than reflecting disaffection. The association between drinking and sense of belonging or disaffection may also depend on contextual factors. In any case, this association needs to be explored in greater depth.

The results do not offer support to the supposed moderating role of cultural models on the effect of impulsivity with respect to hazardous drinking. A significant interaction was found with respect to hazardous gambling. More specifically, ISE1, the models of evaluation of the macro social environment, proved to have a significant interaction with impulsivity and sensation seeking. The more people tend to evaluate the social environment reactively and the more they feel they live in a very unreliable and anomic place, the stronger the relation between sensation seeking and hazardous gambling. It seems reasonable that within an anomic semiotic scenario, gambling acquires the meaning of being a source of heightened sensations in an environment that seems meaningless and detrimental. Another compatible hypothesis is that people expressing a view of the social environment as untrustworthy will be less likely to identify with the rules in their own conduct (Rahn & Transue, 1998) and more likely to express their impulsivity through hazardous behaviours that are less socially accepted. This hypothesis is consistent with the suggestion that identification with their micro social environment acts as a protective factor against harmful behaviours associated with socially undesirable ends, both for individuals and for their micro contexts (Manton, Pennay, & Savic, 2014).

The results do not offer support for the supposed moderating role of cultural models in depression with regard to hazardous gambling. Significant interactions were found between depression scores and two components of the cultural model, ISE1 and ISE3, with respect to hazardous drinking. More specifically, for ISE1, evaluating the social environment in a reactive way increases the effect of depression on hazardous drinking. This aspect is easily understood if we consider that a negative approach homogeneously applied to all contexts of people's life could make them think that a solution is hard to find. Several studies (Colder, 2001; Miranda, Meyerson, Long, Marx, & Simpson, 2002) show that alcoholics consider their addiction as the only possible result of their life, since there is no way to improve the way they live. From this perspective, our results suggest how important work may be for the development of a positive image of the social environment. Trust in politics, public service, and one's capacity to improve one's own condition does not have a minor role in attenuating feelings of desperation, which, in turn, may affect hazardous behaviour. With respect to ISE2 (the component of the cultural models regarding the relation with the social environment), the higher people are on the *Unrepresentability* polarity, where Italians and respondents' colleagues, friends, and family are not defined, the more depressed they are, and the more likely they are to engage in hazardous drinking. By contrast, the higher people score on the *Retreat* polarity, where family, friends, and colleagues are idealized as a happy, reliable oasis compared with the wider anomic social environment, the slighter the association between their level of depression and their likelihood of engaging in problem drinking. Previous studies have documented the interaction between depression, family and work relationships, and climate quality, that is, parent-child conflict, marital conflict, commitment to family rules, perceived support at work, and work pressure (El-Sheikh & Flanagan, 2001; Grzywacz & Marks, 2000), in affecting alcohol consumption. Our findings suggest that how one's micro social environment is represented is another key variable in the association between depression and drinking.

Limitations

The results of the present study should be considered in light of several methodological limitations. First, our case study is based on a convenience sample in south-eastern Italy. Previous studies in the same area have already shown the relationship between a critical view of the social environment and hazardous behaviours (Venuleo, Salvatore, & Mossi, 2015; Venuleo et al., 2016). However, we might suppose that in other countries where there is a generalized trust in politics and institutions, trustworthiness is not a relevant criterion to differentiate people's cultural models and individuals' probability of engaging in hazardous behaviour. More broadly, in different populations, different cultural models might work as either protective factors or as risk factors. The generalization of results needs to be treated with caution. What does appear to be generalizable is the relationship between cultural models and target addictions; nevertheless, the content, strength, and nature of this relationship is probably context specific (Venuleo, Salvatore, & Mossi, 2015).

Second, appropriate caution should be exercised in drawing causal inferences from data. We proposed an interpretation of the cultural models as a factor of vulnerability towards hazardous behaviours, but this relationship is likely to be reciprocal to some extent. For example, our study does not allow us to rule out that the high level of distrust in the social environment is the by-product of problems with gambling or drinking, or that cultural models and hazardous behaviours feed off each other. Similarly, impulsivity and depression may be either risk factors for hazardous gambling and drinking or an effect but may also have a bidirectional relationship. Future work to clarify the nature of this interaction is warranted.

Third, we have to acknowledge that other individual and psychosocial factors may mediate the effects of the variables investigated or suggest alternative hypotheses. Fourth, we adopted only one instrument—the questionnaire on the Interpretation of the Social Environment (ISE)—to detect cultural models. Even though its construction criteria are consistent with the idea that culture is made up of generalized meanings, the questionnaire allows us to detect how people interpret some domains of experience and not others, and does not allow us to take into account that the features of a culture are not the same over time (Valsiner, 2003). Finally, the decision to use measures based on the CFAs for our variables of interest allows less appropriate comparisons with the existing literature. On the other hand, CFAs confirm the factor structures of the instruments, and by dropping items, we were able to obtain more appropriate measures for our sample.

Conclusion

Despite these limitations, the findings deserve attention. At the theoretical level, the results support the idea that the system of meanings by which people interpret their experience is an important aspect in the analysis of the social and psychosocial dynamics of hazardous behaviours. People from the same country show different

probabilities of manifesting problems with drinking or gambling related to the cultural models through which they make sense of their social experience and environment. Furthermore, cultural models appear to interact with impulsiveness traits associated with hazardous gambling and with the vulnerability to depression associated with hazardous drinking. On the whole, the results suggest an integrated model of hazardous behaviours wherein cultural models play a significant role in moderating the path of individual vulnerability to problem drinking and problem gambling. The findings encourage an in-depth investigation of the interplay between cultural factors and other risk factors documented by the literature.

At the methodological level, the study suggests the need to improve prevention programmes and strategies of intervention focused on the recognition and elaboration of the subjects' cultural models, which seem to offer a shared terrain for the onset of different kinds of hazardous behaviours. Knowledge of cultural models can provide valuable information for the design of health programmes addressed to individuals, as well as to the intersubjective life worlds within which people's cultural models develop.

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Appendix A**Response Modalities Most Significantly Associated With the First Factorial Dimension (ISE1) of the Interpretation of the Social Environment Questionnaire**

Test value	Item	Response modality
Moderation		
-6.61	I feel I belong mostly to Italy	Quite agree
-6.37	Do you like living in Italy?	Quite agree
-6.17	In your opinion, in general, nowadays to what extent are Italians worried/confident?	Quite worried
-6.02	Sometimes I need to bend the rules to help people I care for	Quite agree
-5.80	People can rely only on themselves	Quite agree
-5.63	In your opinion, in the town where you live, to what extent are the inhabitants interested in themselves and their family?	Quite agree
-5.59	In your opinion, in general, nowadays to what extent are Italians optimistic/pessimistic?	Quite pessimistic
-5.58	It is currently impossible to make predictions for the future	Quite disagree
-5.53	Public job centers	Quite unreliable
-5.47	Colleagues	Quite reliable
-5.38	In your opinion, in general, nowadays to what extent are Italians practical/idealistic?	Quite idealistic
-5.35	In your opinion, in general, nowadays to what extent are Italians optimistic/pessimistic?	Quite optimistic
-5.35	I don't worry about my future because there is someone else who takes care of it	Quite disagree
-5.35	In your opinion, in the medium term, what will be the degree of development of your area?	Quite low
-5.31	It is currently impossible to make predictions for the future	Quite disagree
Reactivity		
10.40	Italians are committed to improving the collective coexistence	Strongly disagree
10.34	In your opinion, in general, nowadays to what extent are Italians passive/active?	Very passive
10.28	In your opinion, in the medium term, what's the possibility of Italy developing?	Very low
9.73	Public job centers	Very unreliable
9.61	Public administration	Very unreliable
9.57	In your opinion, in general, nowadays to what extent are Italians practical/unrealistic?	Very unrealistic
9.13	In your opinion, in the medium term, what will be the degree of development of the town you live in? (reverse item)	Very high
9.09	In your opinion, in general, nowadays to what extent are Italians optimistic/pessimistic?	Very pessimistic
9.07	In the town where you live, the inhabitants are committed to improving the collective coexistence	Strongly disagree
8.99	Health services	Very unreliable
8.93	It will be more and more difficult to find people to trust	Strongly agree
8.84	I am happy to live in Italy	Strongly disagree
8.78	In your opinion, how important is it to follow the rules?	Not at all important

Table Continued.

Test value	Item	Response modality
8.73	In your opinion, in general, nowadays to what extent are Italians hopeless/calm?	Very hopeless
8.65	I feel I belong mostly to Italy	Strongly disagree

Appendix B**Response Modalities Most Significantly Associated With the Second Factorial Dimension (ISE2) of the Interpretation of the Social Environment Questionnaire**

Test value	Item	Response modality
Unrepresentability		
-14.48	In your opinion, in general, nowadays to what extent are Italians skillful/unskillful?	Missed answer
-14.27	In your opinion, in general, nowadays to what extent are Italians optimistic/pessimistic?	Missed answer
-13.98	If you think about the future, do you feel hopeless/calm?	Missed answer
-13.91	In your opinion, in general, nowadays to what extent are Italians practical/unrealistic?	Missed answer
-13.51	Are your friends influential/uninfluential?	Missed answer
-13.39	Are your friends reliable/unreliable?	Missed answer
-13.33	If you think about the future, do you feel optimistic/pessimistic?	Missed answer
-13.19	In your opinion, in general, nowadays to what extent are Italians hopeless/calm?	Missed answer
-12.81	Is your family influential/uninfluential?	Missed answer
-12.77	In your opinion, in general, nowadays to what extent are Italians active/passive?	Missed answer
-12.57	If you think about the future, do you feel hopeless/calm?	Missed answer
-12.23	In your opinion, in general, nowadays to what extent are Italians worried/confident?	Missed answer
-12.16	Is your family reliable/unreliable?	Missed answer
-12.14	Are your friends capable/incapable?	Missed answer
-12.10	If you think about the future, do you feel worried/confident?	Missed answer
Retreat		
5.64	Are your friends reliable/unreliable?	Very reliable
5.51	Is your family reliable/unreliable?	Very reliable
5.20	Are your colleagues capable/incapable?	Very capable
5.03	Are your friends capable/incapable?	Very capable
5.01	In your opinion, in general, nowadays to what extent are Italians optimistic/pessimistic?	Very pessimistic
4.82	Italy's issues are due to lack of skills	Strongly agree
4.78	Your family is capable/incapable?	Very capable
4.76	Italy's issues are due to the inefficiency of the State	Strongly agree
4.57	It is currently impossible to make predictions for the future	Strongly disagree
4.56	In your opinion, in general, nowadays to what extent are Italians active/passive?	Very passive
4.55	In the town where you live, inhabitants are committed to improving the collective coexistence	Strongly disagree
4.50	In your opinion, in general, nowadays to what extent are Italians practical/idealistic?	Very idealistic
4.44	Is your family influential/uninfluential?	Very influential

Table Continued.

Test value	Item	Response modality
4.30	In the town where you live, inhabitants are committed to improving the collective coexistence	Strongly disagree
4.14	In your opinion, in general, nowadays to what extent are Italians practical/idealistic?	Very idealistic

Appendix C

Response Modalities Most Significantly Associated With the Third Factorial Dimension (ISE3) of the Interpretation of the Social Environment Questionnaire

Test value	Item	Response modality
Sense of belonging		
-8.87	Do you like living in Italy?	Strongly agree
-8.36	Law enforcement	Very reliable
-7.85	Do you like living in the town you live in?	Strongly agree
-7.60	In your opinion, how important is it to take care of your family?	Very important
-7.33	I feel I belong mostly to Italy	Definitely yes
-7.11	If you think about the future, do you feel optimistic/pessimistic?	Very optimistic
-6.84	I feel I belong mostly to my town	Definitely yes
-6.72	Health services	Quite agree
-6.71	In your opinion, how important is it to follow the rules?	Very important
-6.55	Your family is reliable/unreliable	Very reliable
-6.33	Your family is capable/incapable	Very capable
-6.16	If you think about the future, do you feel worried/confident?	Very confident
-6.06	In your opinion, in the medium term, what will be the degree of development of the town you live in? (reverse item)	Quite low
-5.98	If you think about the future, do you feel active/passive?	Very active
-5.83	In your opinion, in the medium term, what's the possibility of Italy developing?	Quite high
Disaffection		
6.22	In your opinion, how important is it to take care of your family?	Quite agree
5.91	I feel I belong mostly to Italy	Quite disagree
5.89	In the town where you live, inhabitants are respectful of the rules	Quite disagree
5.43	In your opinion, how important is it to follow the rules?	Quite disagree
5.18	I feel I belong mostly to Europe	Quite disagree
5.05	Do you like living in Italy?	Strongly disagree
5.03	I feel I belong mostly to my town	Quite disagree
4.75	Public transport	Quite unreliable
4.70	Do you like living in the town you live in?	Quite disagree
4.70	In the town where you live, inhabitants are committed to improving the collective coexistence	Quite disagree
4.64	Public job centers	Very unreliable
4.62	Do you like living in the town you live in?	Quite disagree
4.61	How satisfied are you with your current situation? (reverse item)	Rather satisfied
4.59	In your opinion, in the medium term, what's the possibility of Italy developing?	Rather low
4.56	Are your friends capable/incapable?	Quite incapable