Paidéia
sep-dec. 2017, Vol. 27, No. 68, 255-262. doi: 10.1590/1982-43272768201702
ISSN 1982-4327 (online version)

Article

Relationship Between Sensory Processing, Resilience, Attitudes and Drug use in Portuguese Adults[1]

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Abstract: Research suggests that the relationship between resilience and substance use is a non-linear and multifactorial psychological process. Surprisingly, sensory processing is rarely mentioned as a variable associated with this phenomenon. In this study, we investigated the relationship between resilience, sensory processing, attitudes and consumption behaviors for alcohol, tobacco and other psychoactive substances. For this, we used four instruments: Adult / Adolescent Sensory Profile; Resilience Scale; Attitudes scales; Tobacco, Alcohol and Other Drug Use Scale. The sample consisted of 340 healthy adult participants, of whom 261 (76.8%) were women and 79 (23.2%) men. As for chronological age, the youngest person was 18 and the oldest was 76 years (M = 39; DP = 11). Sensory processing was associated with the intake behaviors and attitudes. Sensory imbalances appeared to be implicated in decreased resilience.

Keywords: mental states, resilience (psychology), attitude measures

Relações entre Processamento Sensorial, Resiliência, Atitudes e Consumo de Drogas em Adultos Portugueses

Resumo: A investigação sugere que a relação entre resiliência e uso de substâncias é um processo psicológico não linear e multifatorial. Surpreendentemente, o processamento sensorial raramente é evocado enquanto variável associada a estes fenômenos. O objetivo deste estudo foi investigar as relações entre processamento sensorial, resiliência, atitudes e frequência de comportamentos de consumo de álcool, tabaco e outras substâncias psicoativas em adultos saudáveis. Foram empregados quatro instrumentos: Perfil Sensorial para Adolescentes e Adultos; Escala de resiliência; Escalas de atitudes; Escala de consumo de tabaco, álcool e outras drogas. A amostra foi constituída por 340 participantes adultos mentalmente saudáveis, dos quais 261 (76.8%) eram mulheres. Quanto à idade cronológica, o indivíduo mais novo tinha 18 anos e o mais velho tinha 76 anos (M = 39; DP = 11). O processamento sensorial apresentou-se associado a atitudes e condutas de consumo. Os desequilíbrios sensoriais parecem estar implicados na diminuição da resiliência.

Palavras-chave: estados mentais, resiliência (psicologia), medidas de atitude

Relación entre Procesamiento Sensorial, Resiliencia, Actitudes y Consumo de Drogas en Adultos Portugueses

Resumen: Investigaciones sugieren que la relación entre la resiliencia y el uso de sustancias es un proceso psicológico no lineal y multifactorial. Sorprendentemente, el procesamiento sensorial raramente se menciona como una variable asociada a estos fenómenos. En el presente estudio fue investigado la relación entre el procesamiento sensorial, la resiliencia, las actitudes y el comportamiento de consumo de alcohol, tabaco y otras drogas. Fueron utilizados cuatro instrumentos de medida: Perfil Sensorial para Adolescentes y Adultos; Escala de Resiliencia; Escalas de Actitudes; Escala de consumo de alcohol, tabaco y otras drogas. La muestra fue constituida por 340 participantes adultos sanos, de los cuales 261 (76.8%) eran mujeres y 79 (23.2%) hombres. En cuanto a la edad cronológica, el individuo más joven tenía 18 años y el más viejo 76 años (M = 39; DP = 11). El procesamiento sensorial se mostró asociado a las actitudes y la conducta de consumo. Los desequilibrios sensoriales parecen estar implicados en la disminución de la resiliencia.

Palabras clave: estados mentales, resiliencia (psicología), medidas de actitud

The desire to use psychoactive substances is associated with modified patterns of sensory processing (Engel-Yeger, 2014; Stols, van Heerden, van Jaarsveld, & Nel, 2013). There are indications that for those on a diet for example, a tasty bit of food may appear larger and stand against the background, due to a perception bias. When asked to estimate the size of a muffin before and after being exposed to cues about tempting foods, those on a diet tended to over-estimate the size of the muffin compared to normal subjects, who were not influenced

[1] Paper deriving from the doctoral dissertation by the first author, under the advice of the second author and co-advice of the third author, defended in the Graduate Program in Health Psychology at the Universidad Miguel Hernandez de Elche.
Support: Agência Regional para o Desenvolvimento da Investigação, Tecnologia e Inovação - ARDITI (Projeto BD # nº1080/1974 - Bolsa Individual de Formação).

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by hedonic-prestimulation (van Koningsbruggen, Stroebe, & Aarts, 2011). Van Dillen, Papies and Hofmann (2014) mention other studies showing that mental capacity may influence the use of behavioral competences, to the extent that overloading the perception-cognitive processes underway in a given subject may influence his/her ability to contain his/her impulses when triggered by a hedonic stimulus. There is a consensus that a potentially tempting stimulus, such as tasty food, a glass of cold beer or a cigarette, may trigger reward associations (Ferguson & Bargh, 2004; Hofmann, Rauch, & Gawronski, 2007).

Using brain imaging techniques such as PET scans, we found that the development of the CNS proceeds from the lower to the upper levels (Parham & Mailloux, 1996). The environment has a determining influence on the brain, both structurally and functionally, its ultimate expression being found in behavior. Adapted behavior is intentional and goal-oriented (Fisher, Murray, & Bundy, 1991), and assumes a fully functioning sensory process.

Currently there are four types of known sensory types (Engel-Yeger, 2014): *Sensation Seeking*, which represents high thresholds and an active self-regulation strategy; *Sensation Avoiding* which includes low thresholds and the same active self-regulation strategy; *Low Registration* which represents a high threshold and a passive self-regulation strategy; *Sensation Sensitivity* which includes low thresholds and a passive self-regulation strategy.

Operationally, these expressions characterize different forms of neuropsychological homeostasis: *Sensation Seeking* implies in prospecting for creative sensory experiences in daily living, such as touching others, wearing perfume or chewing gum to counter a tendency to fail to detect sensory stimuli; *Sensation Avoiding* avoid overly massive sensory experiences their nervous system is unable to handle, they cover their ears, close the curtains or go to another part of the house. *Sensation Sensitivity* tends towards a passive reaction to sensations perceived as intense and disagreeable, and that may translate into emotional, cognitive, behavioral and even relational instability. *Low Registration* implies in recurring failure to detect sensory stimuli, a deficit that manifests itself more often than the norm, and results in important signals for involvement in daily activities being ignored, such as not acknowledging someone entered the room, or not realizing one's hands are dirty.

Resilience, originally used in physics to describe a body's ability to recover it shape and size following deformation, was quickly adopted in psychology and is often used to describe human beings, particularly to describe the ability of some subjects to prevail (and even prosper), despite the pressures they experience in their daily lives (Fletcher & Sarkar, 2013).

Fergus and Zimmerman (2005) investigated the implicit factors of resilience that protect against the use of diverse psychoactive substances. These studies are extremely important, as replicating the components of this specific type of resilience would provide ample opportunity to create preventive measures effective enough to provide actual immunization against drug use.

The theory of resilience applied to exposure to behavioral risks is centered on understanding the salutogenic phenomena that contrast with exposure to potentially deviating life events. In this regard, some researchers suggest that resilient individuals show improved self-esteem and are less likely to be involved in risky behavior. In fact, abstinents tend to score higher in resilience that those who use alcohol. Explicitly, studies of resilience may be an effective means to foster adaptive behavior towards drug use (Gutiérrez & Romero, 2014).

Attitudes inherent to drug use have been investigated for a long time to prevent their abuse (Petraitis, Flay, & Miller, 1995). If this is confirmed to a satisfactory degree, it could lead to applications useful for healthcare. For example, individual differences in terms of substance dependence seem to be better explained by over-valuing the effect of drugs, as they are sought after by subjects. This influence would override environmental stimuli. It is therefore likely that those who show attitudes that favor considering drugs as instrumental goals would be more likely to become drug-dependent (Hogarth & Chase, 2011).

A growing body of research strongly suggests that metaphors inspired on physical sensations to indicate attitudes are not merely ornaments of everyday discourse. It is possible that expressions such as "human warmth", "cold person" "clearly showed his/her intentions", and "a bleak scenario", among others, have a neural basis that links intent to sensory-perceptive phenomena (Bohner & Dickel, 2011). Experimental studies confirm this hypothesis, volunteers offered a warm beverage on the way to the lab later found the target-person to be ambiguous and assigned higher scores in features such as "generous" and "caring" than those offered a cold beverage (Williams & Bargh, 2008).

Attitudes are comprised of diverse factors, such as intrinsic information, representation and the emotional and contextual aspects associated with the experience of a given social object. Therefore, direct experimentation (self) and indirect experimentation (through others) of psychoactive substances gives rise to sensations, recommendations and reports that are the basis for developing attitudes, and these may consequently be associated with the intent to act and engage in actual use behavior (López, 2013).

Thus, the objective of this study was to investigate the relationship between sensory processing, resilience, attitudes and frequency of use of alcohol, tobacco and other psychoactive substances among healthy adults. We thus expect to contribute to an explanation of the use of psychoactive substances among a normative and mature population.

Method

Participants

The sample consisted of 340 mentally healthy adults, 261 (76.8%) female and 79 (23.2%) male. The youngest was 18 and the oldest 76 (M = 39; SD = 11). The majority of the respondents (N = 340) were part of the [economically] active population - 81.8% were employed, 59% retired, 2.1% work at home and 9.7% were unemployed. Only 0.6% were on some sort of leave. A little over half the respondents (51.4%)

had a university degree, while 30.9% had a secondary school degree, 16.2% had a primary or middle school degree, and 1.5% had not completed primary school.

Most of the subjects do not smoke (77.9%), take stimulants (96.2%) or tranquilizers (78.8%), and drink alcohol rarely (60.3%) Just under half do not take pain-killers (46.2%). A very small percentage (2.1%) uses marijuana. None of the participants uses cocaine or heroin, and 3.2% report that they use synthetic drugs rarely. Therefore, given that they are not significant in the sample, these substances shall not be included in this study.

Instruments

The following instruments were used:

(a) *The Adolescent/Adult Sensory Profile - SPA* (Brown & Dunn, 2002), which allows us to assess behavioral responses to sensory stimuli in individuals eleven and older. This instruments allows standard measurements of the effects of sensory processing on subject functional performance. The results allow us to deepen our understanding of why people engage in certain behaviors, and why they prefer certain environments and experiences. Subjects answer questions on how they respond to sensations in general, rather than at specific moments. It is a self-reporting questionnaire that measures responses to sensory events in everyday life. Individuals complete the questionnaire by selecting frequency of response (*nearly never, seldom, occasionally, frequently, almost always*). There are sixty items in the questionnaire, split into four quadrants - *Low Registration*, *Sensation Seeking, Sensory Sensitivity and Sensation Avoiding*. There are fifteen questions for each type of sensory processing. Questions also cover a number of functional sections of functioning: visual, hearing, tactile, taste/smell, movement and level of activity. Low Registration items identify behaviors such as missing stimuli or slower response. ("I don't get jokes as quickly as others"). Sensation Seeking items identify responses and characteristics such as enjoyment, creativity, and the pursuit of sensory stimuli. ("I add hot-sauce to my food.") Sensory Sensitivity items identify responses such as noticing behaviors, distractibility, and discomfort with sensory stimuli. ("I'm afraid of heights.") Sensation Avoiding items identify responses and behaviors such as deliberate acts to reduce or prevent exposure to sensory stimuli, and efforts to make exposure more predictable. ("I only eat familiar foods.")

The validity of the tool was observed in tests that measured skin conductance, finding different patterns of physiological response corresponding to different patterns of sensory processing, and corroborated with contrasting patterns of sensory processing in youth, middle-age and old-age. The original AASP studies also mention an acceptable level of internal consistency, with alpha values between 0.639 and 0.775. Nevertheless, we chose to exclude the sensation seeking subscale as it was the only one with an alpha lower than 0.70. To enable its use in this study, the AASP was translated and adapted to the Portuguese language and culture, complying with international agreements on the matter, under the close guidance of the scientific department of the psychological test publishing house that owns the copyright.

(b) *The Resilience Scale - RS* (Wagnild & Young, 1993), developed to measure the capacity to withstand life stressors, and to thrive, and create meaning from challenges. It consists of a twenty-five item questionnaire presented as statements, which respondents answer using a 7-point Likert scale from 1, *disagree*, to 7 *agree*. Content validity was ensured from the moment the scale was built, as the authors first established the core characteristics of resilience, following exhaustive theoretical review. After that, verbatim citations from adult interviewees who are consensually resilient (Alzheimer patient care-givers for example) were used to adopt the questionnaire items. The initial translation and cultural localization for the Portuguese population were performed by Felgueiras, Festas and Vieira (2010). Psychometric validation for the adult Portuguese population is more recent, and was done by Ng Deep and Leal (2012), with a Cronbach's alpha of 0.87 for 23 items, suggesting internal consistency.

(c) *The Tobacco, Alcohol and Drug Attitude Scales* (TUS, AUS and DUS) (López-Sánchez, García del Castillo, Mira, & Estévez, 2000) were combined by the authors into a single questionnaire. These consist of three, thirteen-item scales and a 5-point Likert scale from *completely agree* to *completely disagree*, with three subscales covering different questions regarding tobacco, alcohol and other drugs. These researchers analyzed the psychometric characteristics of the scale and concluded the measurements were satisfactory. Studies and internal consistency of the Tobacco Attitude Scale show an $\alpha = 0.76$ in the perception of satisfaction scale, $\alpha = 0.82$ in the displeasure index and $\alpha = 0.91$ in attitudinal disposition. For the reliability of the Alcohol Attitude Scale, $\alpha = .82$ in willingness to use and $\alpha = 0.91$ for the displeasure index. For the Drug Attitude Scale, $\alpha = 0.74$ for risk perception, and $\alpha = 0.84$ in willingness to use drugs. To enable its use in this study, the tool was translated and adapted to the Portuguese language and culture, complying with international agreements on the matter, under the close guidance of the authors. To avoid theoretical complexity and redundant analyses and results discussions, as the sample consisted of individuals who were not major users of these substances, we chose only the elements of the questionnaire related to aversion, specifically the tobacco displeasure index, the alcohol displeasure index, and the perception of risk associated with drugs. We pre-tested a group of 10 individuals to check the need to adapt the attitude questionnaires to the adult Portuguese population, as the existing questionnaires were intended for adolescents only. However, the respondents of the preliminary survey had no problem interpreting and completing the questionnaire.

(d) *The Tobacco, Alcohol and Other Drug Use Scale* (TADU) (García del Castillo, López-Sánchez, Gázquez, & García del Castillo-López as cited by García del Castillo, 2011) is a self-applied questionnaire consisting of twenty-four items that are eclectic and superimposable, based on the principle that comparing studies on substance use behavior is a difficult task, as researchers have yet to arrive at a consensus regarding which metrics to use. In this regard, the tool aims to constitute an exploratory, user-friendly tool covering the entire spectrum of producing and consuming data that is sufficiently objective and reliable to assess the use of psychotropic substances.

Procedure

Data collection. Patients who were discharged from psychotherapy provided by several healthcare units were invited to consent to participate in this study. Exclusion criteria were mental or behavioral disorders beyond the problems for which they are receiving clinical care (according to DSM-V (American Psychiatric Association, 2014) and that brought them into the office (e.g. grief, (V62.82), unspecified relationship problems (V62.81), life phase/biographical problem (V62.89)…]. It is believed that these patients, apparently well and adjusted in the face of adversity, are those who are more capable of recognizing the benefits of healthcare resources, and do not hesitate to use them proactively on behalf of their own well-being. Thus, we believe that this controlled data gathering context offered the right conditions for gathering data consistent with the goals of this study. The rate of acceptance was 80%, resulting in a selected sample of 368 anonymous volunteers. Around five subjects were excluded for failure to properly fill out the questionnaires. Twenty-three questionnaires were discarded as they did not acknowledge consumption of any substance.

Data analysis. In the statistical analysis, we highlight two types of data treatment: linear correlations to check for any association between two numerical values, and equal distribution tests to check for differences between independent groups. Considering that the scales are the sum of Likert-type points, or numerical, ordinal variables, we used Spearman's correlation for the same reason, and the Kruskal-Wallis test to compare two or more groups of an independent variable.

Ethical Considerations

This study addresses all ethical aspects and was approved by the Ethics Committee of the institution where the study took place. The investigator explained the informed consent form to each participant, and they all signed agreeing on the future use of the study data in scientific research and publications. Once this was done, the handed out the questionnaire and instructed respondents individually on how to fill them out. After the assessment, each volunteer placed the questionnaire inside a white envelope, sealed it and placed it in a container for the investigator.

Results

The internal consistency measures of the scales used to test this sample was suitable (alpha greater than 0.70), at times exceeding the values in the original studies. We found a slight negative connection between Low Registration and displeasure index towards tobacco. The correlation between attitude scales towards alcohol and drug use and sensory profile tend not to be significant, and the significant correlations are very small (Table 1).

Table 1

Spearman Correlation Coefficients between Sensory profile and Attitudes

			Sensory Profile (SP)		
			Low Registration	Sensory Sensitivity	Sensory Avoidance
Attitudes	Tobacco use scale (TUS)	Tobacco displeasure index	-.121*	.078	.044
	Alcohol use scale (AUS)	Alcohol displeasure index	.100	.137*	.152**
	Drug use scale (DUS)	Drug use risk perception	-.018	.031	-.106

Note. * $p < .050$. ** $p < .010$.

The displeasure towards alcohol index seems to be linked to sensibility and avoidance.

We found significant but very weak negative correlations between resilience and sensory profile, with coefficients ranging from -0.153 to - 0.144. We also found a weak correlation between resilience and attitudes towards tobacco, alcohol and use (Table 2).

Table 2

Spearman Correlation Coefficients between Resilience, Sensory profile and Attitudes

			Resilience (RS)	
Attitudes		Sensory Profile (SP)	Low Registration	-.153**
			Sensory Sensitivity	-.147**
			Sensation avoiding	-.144**
	Tobacco use scale (TUS)		Tobacco displeasure index	.190**
	Alcohol use scale (AUS)		Alcohol displeasure index	.188**
	Drug use scale (DUS)		Drug use risk perception	.180**

Note: *$p < .050$. **$p < .010$.

We found significant differences in the Low Registration scale according to frequency of use of tranquilizers (X = 6.08; p = .048) (Table 3). The subjects who do not take tranquilizers register a median of 25 on the Low Registration scale, compared to 28 among subjects who use tranquilizers. There were significant differences in sensory sensitivity according to the frequency at which subjects take tranquilizers (X = 21.315; p < .01) and pain-killers (X = 16.58; p < .01). In both cases subjects who use these substances have a higher median than those who use them rarely, who in turn have a higher median than those who do not use them. In the Sensory Avoidance quadrant, we found significant differences among subjects using more or less tranquilizers or pain-killers. We find that comparisons regarding these substances have an evidentiary value of less than 0.06. We found higher medians among those who consume these substances, and lower medians among those who do not.

We found no statistically significant differences in sensory profiles related to tobacco, alcohol or stimulant use. We found no statistically significant differences in resilience towards the use of any substance, so we do not consider its illustration to be relevant.

Table 3

Median sensory profile according to frequency of substance use (Kruskal-Wallis)

Median	Tobacco Use			Alcohol Use			Stimulants Use			Tranquilizers Use			Pain-killers Use		
	Yes (n=42)	Rarely (n=33)	No (n=265)	Yes (n=70)	Rarely (n=205)	No (n=65)	Yes (n=2)	Rarely (n=11)	No (n=327)	Yes (n=23)	Rarely (n=49)	No (n=268)	Yes (n=31)	Rarely (n=152)	No (n=157)
Low Registration (SP)	24.5	26.0	25.0	24.5	25.0	26.0	37.0	28.0	25.0	**28.0**	**26.0**	**25.0**	28.0	25.0	25.0
	X = 0.93; p = .629			X = 3.41; p = .182			X = 3.87; p = .144			***X* = 6.08; *p* = .048**			X = 4.04; p = .133		
Sensory Sensitivity (SP)	36.0	36.0	36.0	35.5	36.0	34.0	47.5	38.0	36.0	**39.0**	**38.0**	**35.0**	**41.0**	**36.0**	**35.0**
	X = 0.07; p = .963			X = 0.50; p = .778			X = 3.83; p = .148			***X* = 21.32; *p* < .01**			***X* = 16.58; *p* <.01**		
Sensory Avoidance (SP)	36.0	37.0	34.0	34.0	35.0	35.0	48.0	39.0	34.0	**39.0**	**35.0**	**34.0**	**37.0**	**34.0**	**34.0**
	X = 0.39; p = .825			X = 2.42; p = .299			X = 3.71; p = .156			***X* = 6.85; *p* = .032**			***X* = 6.55; *p* = .038**		

The displeasure towards tobacco index also displays significantly different distributions based on the frequency with which subjects use tobacco, alcohol and pain-killers. In this case, the displeasure index towards tobacco increases among those who use less (or do not use) tobacco or alcohol, with no definite pattern regarding the use of pain-killers, with a median of 17 among those who rarely use pain-killers, 16 among those who use pain-killers, and 15 among those who do not use pain-killers.

Regarding displeasure towards alcohol, we found higher medians among those who do not smoke (X = 13.39; p < .001). We found significant differences in the attitude scale for drug use based on frequency of use of pain-killers (X = 7.14; p = .028), but these are not explained by the median (Table 4). We found no statistically significant differences in attitudinal measures concerning the use of stimulants and tranquilizers.

Table 4

Median on the attitude scale according to frequency of use of more common substances

	Attitude Median (ESAC)	Tobacco Use			Alcohol Use			Stimulants Use			Tranquilizers Use			Pain-killers Use		
		Yes (*n*=42)	Rarely (*n*=33)	No (*n*=285)	Yes (*n*=70)	Rarely (*n*=203)	No (*n*=85)	Yes (*n*=2)	Rarely (*n*=11)	No (*n*=346)	Yes (*n*=23)	Rarely (*n*=49)	Não(*n*=286)	Yes(*n*=31)	Rarely (*n*=152)	No (*n*=171)
Alcohol use scale (ASU)	**Tobacco displeasure index**	**12.0**	**13.0**	**17.0**	**14.0**	**16.0**	**17.0**	14.5	18.0	16.0	16.0	18.0	16.0	**16.0**	**17.0**	**15.0**
		***X* = 62.81; *p* < .01**			***X* = 9.12; *p* = .01**			X = 1.50; p = .473			X = 4.49; p = .106			***X* = 9.04; *p* = .011**		
	Alcohol displeasure index	**10.0**	**9.0**	**11.0**	**8.0**	**11.0**	**16.0**	17.0	10.0	11.0	12.0	12.0	11.0	12.0	11.0	10.0
		***X* = 13.39; *p* = .001**			***X* = 71.13; *p* < .01**			X = 3.76; p = .153			X = 4.72; p = .094			X = 4.16; p = .125		
	Drug use risk perception	15.0	15.0	15.0	15.0	15.0	15.0	15.0	14.5	15.0	15.0	15.0	15.0	**15.0**	**15.0**	**15.0**
		X = 0.93; p = .627			X = 1.21; p = .546			X = 1.83; p = .401			X = 5.07; p = .079			***X* = 7.14; *p* = .028**		

Discussion

These results suggest that variations in sensory processing have a negative correlation with resilience. This finding refers to the participation or errors of omission or excess sensory information in obstructing the correct interpretation of reality and consequent positive adaptation to adversity.

Low Registration is higher among those who use tranquilizers than among those who do not. This can be explained by suggesting that a lack of sensitivity to external events could give rise to a compensatory increase in sensitivity to internal events such as heart-rate, peristalsis and other neuro-vegetative phenomena. This could result in increased body awareness and anxiogenic interpretation of somatic sensations (Engel-Yeger & Dunn, 2011a), which could result in increased use of tranquilizers to control the symptoms of anxiety. On the other hand, tranquilizers interfere in inhibition of neuron activity, reducing the conductance of sensory information, and are thus able to increase failures of sensory registration and an increase in the levels of the Low Registration quadrant. Sensory sensitivity increases with frequency of use of tranquilizers and pain-killers. It is reasonable to suggest the individuals who are more overloaded with sensory stimulation would have increased psychophysiological activation and be more susceptible to anxiety and the somatic equivalents (non-specific pain complaints). The logical consequence of this would be the probability of increased prescriptions of anti-anxiety drugs and pain-killers by the attending physician. The same tendency is found in Sensation Avoidance, however in this case it is not as pronounced. Therefore, it is natural that subjects more likely to actively mitigate excessive sensory stimulation would resort a bit less to anti-anxiety drugs and pain-killers as passive defense mechanisms. These results tally exactly with a recent study in sensory processing (Engel-Yeger & Dunn, 2011b), which establishes a significant relationship between increased levels of anxiety trace and state in individuals who score higher on Sensory Avoidance, Sensory Sensitivity and Low Registration respectively.

Resilience correlates positively with aversion attitudes (but not directly with behaviors) towards the use of psychoactive substances. We found a slight positive correlation between resilience and displeasure towards alcohol index. A higher resilience score is associated with increased responsiveness to the possible adverse effects of ethanol. The lack of significant differences in the level of resilience regarding the frequency of use of the substances could be due to very low use rates among respondents, which according to García Del Castillo and Dias (2009), could interfere in the ultimate definition of the results.

The findings of this study allow us to speculate on the influence of the sensory component on attitudes, in line with the findings of Williams and Bargh (2008). In the specific case of attitudes unfavorable towards the use of substances, this tendency may also be linked to the subject's previous experience, specifically use. Thus, attitudes of aversion towards alcohol and tobacco seem to be related to sensory homeostasis. The inhibitive effect of alcohol on the CNS by reducing neural conduction results in generalized sensory perturbation. This can cause numerous symptoms such as gait ataxia, dizziness, nausea and vomiting, among others. It is not surprising therefore, that individuals who are more easily overwhelmed by sensory stimulation would be more averse to this effect. We found a slight negative connection between Low Registration and displeasure towards tobacco. It is possible that, as a stimulant, nicotine may increase neural conduction and facilitate the incorporation of sensory information, promising those who are sensory aloof a momentary recovery of their neuropsychological balance. One should not find it strange, therefore, that individuals with Low Registration sensory processing are less susceptible to the adverse effects of tobacco. Engel-Yeger (2014) discuss the hypothesis of self-medication, according to which individuals may use substances as a mechanism of self-compensation for unmodulated levels of excitement, producing relief from uncomfortable emotional states. Theoretically, hypo- or hyper-reaction to sensory stimuli could translate into different levels of excitement and emotional states, thus subjects vary regarding their substance use behavior. It makes sense, therefore, that alcohol and stimulants (including nicotine), as substances that perturb or increase sensory input, are not sought after to any relevant extent to regulate the sensory, neurological or emotional functioning of psychologically adjusted subjects.

One would assume that those who use tobacco and alcohol would resolve their cognitive dissonance by arguing against and devaluing the negative effects of these addictive, socially accepted and widely available substances. Naturally, those who devalue the negative effects of tobacco and alcohol (compared to the positive effects they value), are more likely to use these substances (Hogarth & Chase, 2011). Questioning adverse attitudes towards the use of specific substances seems to have been better understood by the participants than a more generic reference on the risk of using drugs. This may be the reason for the absence of statistically explanatory differences in this measurement compared to consumption.

The sample in this study is too small, specific and heterogeneous to be representative of the population. These Limitations make it impossible to generalize the results. Furthermore, use rates among respondents were very low, which according to García Del Castillo and Dias (2009) could questionably condition the presentation of the findings. The statistically significant relationships between variables that we did find were too weak to enable using structural equations, hence we were unable to check causality. Finally, results analysis was limited by a few constraints: The TADU use questionnaire did not have the improvements required to provide more reliable information, for example on the amount of substance used. The Attitude Scales (TUS, AUS and DUS) would benefit from careful re-adaptation to the adult population. The Sensory Profile was not calibrated for the Portuguese adult and adolescent population. As this tool was merely adapted, it misses, for instance, cutoff points for a specific analysis of variations in use amount as a function of sensory processing quadrants.

The relationship found between resilience and sensory profile, and its involvement in psychoactive substance use or behaviors in adults, show the need to continue to explore the

explanatory relevance of these variables for future studies on drug use behavior. We believe the preventive potential of this line of research justifies this.

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Received: Mar. 24, 2016
1st Revision: Aug. 15, 2016
Approved: Aug. 17, 2016

How to cite this article:
Borges, J. M., Marzo, J. C., García del Castillo, J. A., & López-Sánchez, C. (2017). Relationship between sensory processing, resilience, attitudes and drug use in portuguese adults. *Paidéia (Ribeirão Preto), 27*(68), 255-262. doi: 10.1590/1982-43272768201702