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# Pre-operative anxiety and breast biopsy: A systematic review of empirical studies

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❧ ABSTRACT. Lo scopo della presente review è stato identificare alcune variabili psicosociali in grado di influenzare i livelli di ansia nelle donne sottoposte a biopsia al seno. È stata prodotta una review basata sui criteri PRISMA con un campione finale di 9 studi empirici pubblicati tra il 1996 ed il 2015. I risultati ci permettono di individuare le seguenti dimensioni connesse con l'ansia pre-operativa: l'Ansia di Tratto, la presenza di Eventi Cronici Stressanti, il Worry e l'Incertezza circa i risultati, il Waiting Time, sia la Qualità della Comunicazione che il Supporto Percepito dall'équipe.

❧ SUMMARY. Different studies do not provide clear evidence with respect to the variables that are able to influence pre-operative anxiety level in women undergoing breast biopsy. The purpose of this review was to systematically identify variables related with pre-operative anxiety level in breast biopsy context. A PRISMA-guided systematic review was run from July 2015 to September 2016, with a final sample of 9 empirical studies published between 1996 and 2015. Results highlighted that pre-operative anxiety is connected with specific psychosocial variables. The factors that were found to influence breast biopsy related anxiety levels seems to be the levels of Trait-Anxiety in the patients, the presence of Chronic Life Stress, the Worry and Uncertainty about the Result, the Waiting Time, the quality of the communication with the staff members, and the quality of the Support provided by the operators. Many of these variables could be taken as target dimensions for psychological interventions aiming to limit anxiety in women undergoing breast biopsy.

**Keywords:** *Breast cancer, Biopsy, Pre-operative anxiety, Mammography*

## INTRODUCTION

Recent studies estimate that one over eight women in U.S. is at risk of developing breast cancer. (DeSantis, Ma, Bryan & Jemal, 2014). Breast cancer incidence is double that any other cancer type in hight income countries (Vainio & Bianchini, 2002). On the other hand, mortality due to breast cancer has been largely reduced in the last decades, at least partially due to the progress of diagnostic tools and prevention programmes (Khan et al., 2017). Effective methods are indeed available to enhance early diagnoses of breast cancer, first of all mammography together with ultrasound and resonance (Lauby-Secretan et al., 2015). In particular mammography together with biopsy allows to characterize the cancer type at the morfological as well as at the biological level (Vainio & Bianchini, 2002). There is a general consensus among researchers that mammography can affect the psychological well-being of the patients and that it can be associated with psychological distress both in the patients and in their caregivers (Flory & Lang, 2011; Humphrey et al., 2014; Lebel et al., 2003; Miller et al., 2013; Novy, Price, Huynh & Schuetz, 2001; Pineault, 2007; Pritchard, 2009; Soo et al., 2014; Ubhi, 1996). Different studies were focused on the psychological consequences of biopsy under surgery, such as anxiety and physical pain (Aust, et al., 2016; Feig, 2004; Fekrat, Sahin, Yazici & Aypar, 2006; Masood, Haider, Masood & Alam, 2009). Other studies have considered, among other variables, the degree of invasiveness of different diagnostic procedures and concluded that anxiety is associated with the uncertainty of results more that with the type of surgical procedure that is applied (Flory & Lang, 2011; Miller et al., 2014). An exploration of the psychological variables that are associated with higher of anxiety in the diagnostic phase was performed by Novy et al., 2001, Drageset & Lindstrøm, 2005 and Harding, 2014, while other studies explored pre/post biopsy anxiety levels with regards to the quality of communication with the health care providers, concluding that this is a relevant factor in reducing anxiety levels (Miller, et al., 2013; Pineault, 2007). Furthermore different characteristics of the staff members were found to have different effects on the quality of the communication and on the patient adherence to subsequent treatments (De Vries et al., 2014). Finally the relationship between anxiety and waiting time for the results of the breast biopsy was also explored (Ubhi et al., 1996). A rather long series of empirical investigations have tried to provide an assessment of pre-operative anxiety before breast biopsy (Andrykowski et al., 2002; Balmadrid et al., 2011; Drageset & Lindstrøm, 2005; Flory & Lang, 2011; Harding, 2014; Humphrey et al., 2014; Miller et al., 2013; Novy et al., 2001; Pineault, 2007; Scott, 1983; Ubhi et al., 1996;). Scott 1983, has examined three variables: *Anxiety*, *Reasoning Ability* in Stressful Condition and *Critical Thinking Ability*, this last being critically related to decision making abilities in stressful situations (Moon, 2008). *Anxiety* levels were found to reach very high levels, comparable to those found in psychiatric patients suffering from acute anxiety crises. Similarly, Hughson, Cooper, McArdles & Smith (1988) found that pre-operative anxiety in women undergoing breast biopsy is much higher than what found in other groups of patients undergoing routine surgery. In an attempt to explore the variables that are potentially able to influence the distress level of patients undergoing breast biopsy, Northouse, et al. (1995), considered six predictive dimensions: *Social Support*, *Marital Satisfaction*, *Family Functioning*, *Hope*, *Concurrent Stress Factors*, *Uncertainty*. All of these were found to influence the pre-operative distress level in a multivariate design. More in general, the detection and evaluation of the difficulties that patients may experience in adjustment to cancer are important in order to propose specific support strategies: treatment adherence and adjustment to cancer can benefit, among other interventions, from an early assessment of the anxiety levels, and from the treatment of excessive anxiety (Hulbert-Williams, Neal, Morrison, Hood & Wilkinson, 2012). In 1997 the construct of *Waiting Game* (Poole, 1997) has been proposed as a suitable way to describe the peculiar experience of being waiting for the results of a relevant diagnostic procedure and outcome. More recently the experience of waiting to undergo a breast biopsy has been specifically explored (Lebel et al., 2003). The experience was evaluated according to sociodemographic factors and to distress related variables, such as *Depression*, *Anxiety*, *Intrusive Thoughts*, *Waiting Game* and *Perceived Risk*. Many subjects were found to experience high levels of *State Anxiety*, *Depression* and *Intrusive Thoughts*, although none of these variables was able to correlate to the time interval to biopsy (Lebel, et al., 2003). However qualitative data highlighted that the perceived anxiety level increased during the wait. Therefore the relevance of the *Waiting Game* construct is not clear at the moment.

Finally a recent study has explored the psychological needs, that are expressed by women with breast cancer in different phases of their illness. The needs, in terms of *Social*

*Support*, *Informations*, *Health Care Facilities*, were found to be maximal before biopsy in patients with a suspect of breast cancer (Liao, Chen, Chen & Chen, 2010).

Overall the different studies do not provide clear evidence with respect to the variables that are able to significantly influence pre-operative anxiety level in women undergoing breast biopsy. Therefore a systematic review of the prospective and comparative studies and randomized and not randomized trials that explore this relationship in women aged between 18 and 84 undergoing breast biopsy is proposed here. Only studies using validated assessment tools will be considered in order to reduce the Cochrane risk of bias. The selected studies have considered the relationship between:

– pre-operative/post-operative anxiety and quality of communication;
– pre-operative/post-operative anxiety and related psychological variables;
– pre-operative anxiety and degree of invasiveness of the surgical technique;
– pre-operative/post-operative anxiety and waiting time to outcome.

## METHODS

In order to achieve the mentioned goal, the following informations have been extracted from the selected articles (see Table 1):

– type of design of research used;
– type of participants (18-84 years-old women);
– aim of the study;
– method;
– results (see Table 2).

## Selection criteria and search strategy

The articles have been selected according to the following inclusion criteria:

1) descriptive studies in English, randomized and non-randomized, prospective, longitudinal, correctional and comparative studies that valued the anxiety level in preoperative phase in an oncological diagnosis context;
2) samples of 18-84 years-old women undergoing breast biopsy. Male patients and other procedures have been excluded to allow greater homogeneity among studies, in

order to provide a better context-specific overview;
3) studies that: (a) have evaluated the preoperative anxiety level pre- and post-biopsy with respect to the quality of the received communication; (b) pre- and post-biopsy anxiety level, and psychological variables considered; (c) pre-biopsy anxiety level and type of surgery procedure used (invasive *vs* non-invasive); (d) pre- and post-biopsy anxiety level related to the awaiting period of the results;
4) measured outcome: (a) presence of significative pre- and post-biopsy anxiety levels; (b) the impact of the waiting time for results on anxiety; (c) possible consequences of preoperative anxiety experienced during the diagnostic phase and in the following months, and possible correlations with other psychological variables.

A literature research was run, from July 2015 to September 2016 in order to retrieve the articles published in electronic databases. The PRISMA guidelines were used. The search engines used were PUBMED, SCIENCE DIRECT and GOOGLE SCHOLAR. The terms used for research were: (a) anxiety, (b) anxiety and breast biopsy, (c) preoperative anxiety, (d) preoperative anxiety concept. The research found 3261 articles, 3161 of which were excluded and the remaining 100 were screened by title and by abstract, basing on the mentioned keywords.

## Data abstraction

Studies that fulfill eligibility criteria were examined by the authors. Two authors (Miraglia Ranieri and Pelagotti.) have extracted the information and then compared them to each other. For each article the following aspects were considered: (1) the publication year, (2) the participants' characteristics, (3) the type of research design, (4) the aim of the study, (5) the instruments used, (6) the results. Any disagreement about the 9 selected articles was consensually resolved.

## Study selection

100 abstracts have been reviewed, and every abstract was analyzed in terms of: (a) design of the study, (b) type of procedure, (c) type of participants, (d) results. Within this first selection, according to the criteria described above we have extracted and examined 54 research papers. At this stage 44 were excluded because they considered male participants,

**Table 1** – Description review table

| References | Design | Sample | Methodology | Aim |
|---|---|---|---|---|
| Ubhi et al. (1996) England | Comparative | 102 UBB | Standard psychological self-report | To compare the level of anxiety in a group of women who underwent biopsy with immediate results and a group of women that the result will be announced later. |
| Novy et al. (2001) USA | Comparative | 102 UBB | Self-report of demographic and medical items Standard psychological self-report | To assess the level of anxiety before the breast biopsy and possible correlations influential. |
| Drageset & Lindstrøm (2005) Norway | Correctional | 117 UBB | Socio-demographic questionnaire Standard psychological self-report | To examine the relationships between demographic characteristics, social support, anxiety, coping and defence among women with possible breast cancer. |
| Pineault (2007) Canada | Exploratory | 631 UBB | Standard psychological self-report | To describe the experience of anxiety in women after an abnormal mammogram are waiting for diagnosis and explore the social support of these patients at this time. |
| Flory & Lang (2011) Israel | Randomized | 112 UBB | Standard psychological self-report | To assess stress levels in women who are waiting for breast biopsy and do not know the diagnosis with 2 groups of women undergoing invasive procedure that know their diagnosis. |
| Miller et al. (2013) USA | Prospective | 138 UBB | Standard psychological self-report | Assessing anxiety in relation to the communication received in the context of ultrasound-guided breast biopsy. |
| Miller et al. (2014) USA | Correctional | 50 UBB | Socio-demographic questionnaire Standard psychological self-report | Investigating whether anticipatory distress before breast biopsy would correlate with biopsy-related outcomes (pain and physical discomfort during the biopsy) and if whether type of distress (anxiety, worry about the procedure, worry about biopsy results) would differentially relate to biopsy-related outcomes. |
| Harding (2014) USA | Correctional | 128 UBB | Socio-demographic questionnaire Standard psychological self-report | To identify the incidence of distress and evaluate associated factors during the breast diagnostic period. |
| Balmadrid et al. (2015) USA | Correctional | 140 UBB | Socio-demographic questionnaire Standard psychological self-report | Explore how time from breast biopsy recommendation to biopsy procedure affected pre-biopsy anxiety and whether the relationship between wait time and anxiety was affected by psychosocial factors. |

*Legenda.* UBB = Undergoing breast biopsy (abbreviations for type procedure).

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**Table 2** – Results review table

| References | Results |
| --- | --- |
| Ubhi et al. (1996) | Results point out the positive effect of an immediate communication on anxiety levels, mostly in benign outcome. |
| Novy et al. (2001) | Study highlights relevance of trait anxiety. The 96% of women-patients reported level of trait anxiety higher than general population. |
| Drageset & Lindstrøm (2005) | Anxiety level wasn't correlated with socio-demographic variables, but seem to me moderate by influence of Coping type. A Strumental Coping seems to be positive related with perceived social. |
| Pineault (2007) | Women showed high level of anxiety in every moment of diagnosis, and level remained constant during all period from biopsy to communication results. |
| Flory & Lang (2011) | Women subjected to biopsy showed higher levels of anxiety than women subjected to an invasive chirurgical procedure. Probably variable as uncertainty of outcome can be considered influential on anxiety more than the procedure. |
| Miller et al. (2013) | A best perception of communication with radiologist was been associated with a low level of anxiety before biopsy. Levels of anxiety seems to decrease after the diagnostic exam. |
| Harding (2014) | Trait anxiety has an important impact on state anxiety. Medical history and previous biopsy didn't have impact on level of perceived distress. |
| Miller et al. (2014) | Distress before biopsy was correlated with pain and physical discomfort. |
| Balmadrid et al. (2015) | Variable Chronic Life Stress (CLS) seems to be important. High level of CLS influenced level of anxiety. |

other type of biopsy, or due to the fact that they were not written in English. Therefore only 9 of the 54 selected articles, published between 1996 to 2015, resulted eligible basing on our including criteria and were included in the final review (see Figure 1).

## Study characteristics

Table 1 shows the characteristics of the nine reviewed documents. Of these nine, one is a prospective study (Miller et al., 2013), two are comparative studies (Novy et al., 2001; Ubhi et al.,1996), one is a randomized trial (Flory & Lang, 2011), one is an explorative research (Pineault, 2007), four are correlational studies (Balmadrid et al., 2015; Drageset & Lindstrøm, 2005; Harding, 2014; Miller et al., 2014). Five of the nine studies were conducted in US, one in England, one in Israel, one in Norway and one in Canada. The selected studies

evaluated different types of interactions: (a) two studies (Miller et al., 2013; Pineault, 2007) evalued the anxiety level pre- and post-biopsy and the quality of the received communication. In particular in these studies the quality of communication was evaluated in terms of the clarity of the information provided, including the details of the risks involved in the proposed procedure, (b) studies that evaluetd the pre-biopsy anxiety level and correlated psychological variables (Balmadrid, et al., 2015; Drageset & Lindstrøm, 2005; Harding, 2014; Novy et al., 2001), (c) studies that considered the pre-biopsy anxiety level and the adopted surgery procedure (invasive vs not-invasive) (Flory & Lang, 2011), (d) studies that have valued the pre- and post-biopsy anxiety level and the awaiting time of the results (Ubhi et al., 1996).

In the selected studies, different scales of measure were used to assess the *Preoperative Distress* of the participants. *Anxiety* was measured in a study with the *Breast Cancer Anxiety Indicator* (*BCAI*) (Pineault, 2007), in another study

**Figure 1** – Flow chart of the systematic review
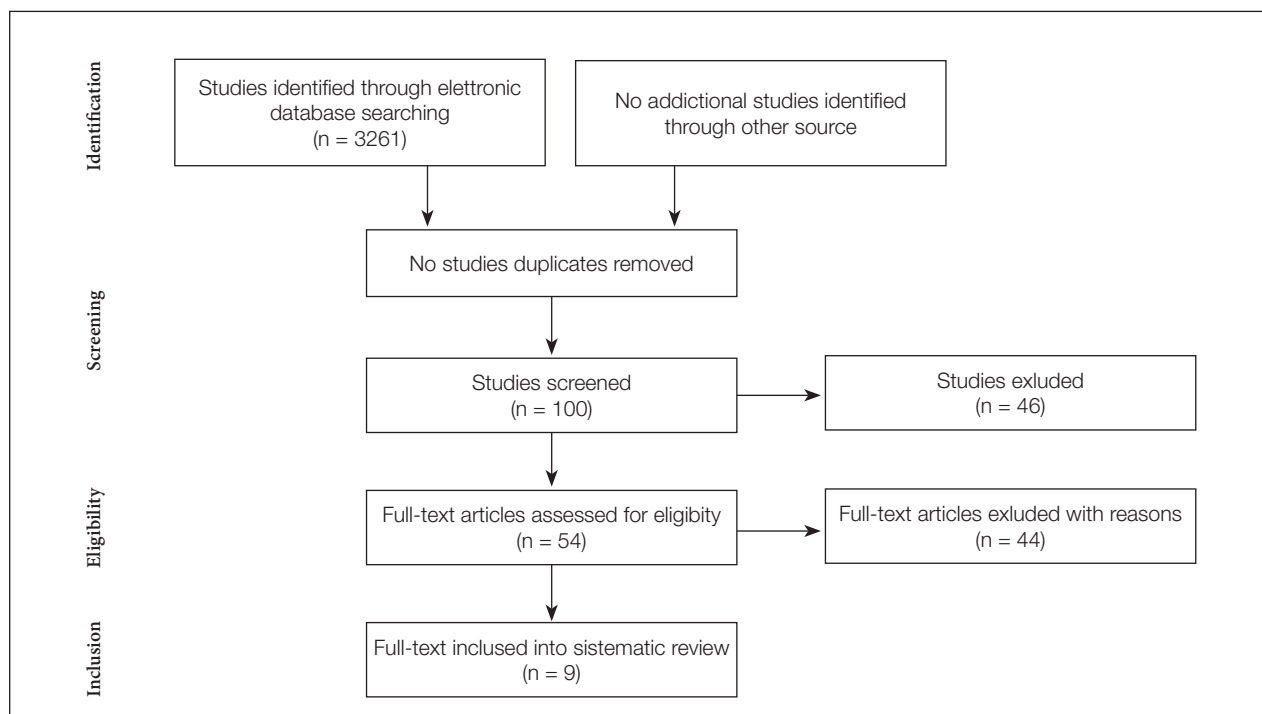


with the subscale *Anxiety* of the short version of the *Profile of Mood States* (*SV-POMS*) (Miller et al., 2014), in two studies with the *Hospital Anxiety and Depression Scale* (*HADS*) (Harding, 2014; Ubhi et al., 1996), in seven studies with the *State Trait Anxiety Inventory* (*STAI*) (Balmadrid et al., 2015; Flory & Lang, 2011; Harding, 2014; Miller, 2013; Novy et al., 2001; Ubhi et al., 1996). *Depression* was measured in two studies with the *Center for Epidemiologic Studies Depression Scale* (*CES-D*) (Flory & Lang, 2011). For more specific measures, such as the impact of events, stress in a study the *Perceived Stress Scale* (*PSS*) (Flory & Lang, 2011) was used, in another study authors referred to the *Psychological Consequences of Screening Mammography* (*PCQ*) (Pineault, 2007). For measurements of the *Quality of communication* between physician and patient, and for social support, different scales were used: the *Multidimensional Scale of Perceived Social Support* (*MSPSS*) (Harding, 2014) and *Medical Outcome Study* (*MOS*) *Social Support Survey* (Balmadrid et al., 2015). To assess the *Satisfaction of the care* in a study was used the *Patient Satisfaction Questionnaire* (*PSQ-18*) (Harding, 2014). In order to assess the worry about the procedure and about the results and the discomfort during biopsy the *Visual Analog Scale* (*VAS*) was used (Miller et al., 2014). Moreover for other

specific assessment the adopted tools were the *Resilience Scale* (*RS-14*), the *Meaning in Life Questionnaire* (*MLQ*), the *Brief Coping Inventory* (*Brief COPE*) (Harding, 2014), the chronic life stress *Questionnaire and the Traumatic life events scale* (Balmadrid et al., 2015).

## Risk of bias in the included studies

When summarizing all the risks of bias according to Cochrane's criteria (see Table 3), among the nine selected study, seven were evaluated at low risk for the selection bias, two instead were considered at high risk. Infact these two studies do not describe their method of data collection. Of the nine evaluated studies six were considered at low risk for the performance and the detection bias, and three at high risk. Six studies were valued at high risk for the Attrition Bias and all nine at low risk for the selective reporting bias. All the studies used standardized instruments. Given the characteristics of the theme analyzed in the review, the presence/absence and the influence of socio-demographic variables reported in the studies was considered as another bias: eight studies resulted at low risk and one at high risk of bias (see Figure 2).

**Table 3** – Analysis of risk of bias in studies examined by the review, according to Cochrane's criteria

| | Selection bias | | Performance and detection bias | | Attrition bias | | Selective reporting | | Other bias | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Risk | Explanation | Risk | Explanation | Risk | Explanation | Risk | Explanation | Risk | Explanation |
| Ubhi et al. (1996) England | H | Randomized was not reported | L | A questionnaire was administered | H | Partial justification for attrition | L | Disclosure was measured by self-report questionnaire | H | Socio-demographic variable influences were not accounted for. |
| Novy et al. (2001) USA | H | Participants were recruited from center on the day of the biopsy, a nurse coordinator discussed this study with the patient | H | No randomization and no blinding, questionnaires were administered | L | Attrition was accounted for | L | Each variable was rated | L | Socio-demographic variable influences were accounted for. |
| Drageset & Lindstrøm (2005) Norway | L | The patients were participants in a national mammography screening program, or were referred by their private physician | L | Self-report questionnaires was administered | H | Attrition was not explained | L | Each variable was rated | L | Socio-demographic variable influences were accounted for. |
| Pineault (2007) Canada | L | Women involved in the QBCSP who had abnormal screening mammogram test results were contacted to take part in the study | L | The questionnaires were distributed by mail | H | Attrition was not explained. | L | Disclosure was measured by self-report questionnaire | L | Socio-demographic variable influences were accounted for. |
| Flory & Lang (2011) Israel | L | Participants were recruited through the radiology department of an urban, tertiary, university-affiliated Beth Israel Deaconess Medical Center | L | Patients were also asked to fill out four questionnaires prior to their randomization | H | Attrition was not explained | L | Disclosure was measured by self-report questionnaire | L | Socio-demographic variable influences were accounted for. |
| Miller et al. (2013) USA | L | Women were invited to participate in this prospective study on day of their procedures by criteria matching | L | Self-report questionnaires were administered | L | Attrition was accounted for | L | Disclosure was measured by self-report questionnaire | L | Socio-demographic variable influences were accounted for. |

*continued*

| | Selection bias | | Performance and detection bias | | Attrition bias | | Selective reporting | | Other bias | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Risk | Explanation | Risk | Explanation | Risk | Explanation | Risk | Explanation | Risk | Explanation |
| Miller et al. (2014) USA | L | Patients were referred to the study by their radiologist and recruited by a research assistant on the day of their breast biopsy, prior to the biopsy | H | Blinding was not reported, Self-report questionnaires were administered | H | Attrition was not explained | L | Disclosure was measured by self-report questionnaire | L | Socio-demographic variable influences were accounted for. |
| Harding (2014) USA | L | Partecipants were recruited from three outpatient radiology clinic at two community hospitals in Ohio and one cancer center in West Virginia | H | Blinding was not reported, women were identified from radiology department schedules | H | Attrition was not explained | L | Disclosure was measured by self-report questionnaire | L | Socio-demographic variable influences were accounted for. |
| Balmadrid et al. (2015) USA | L | Women were invited to participate in this study on day of their procedures by criteria matching | L | Self-report questionnaires were administered | L | Attrition was accounted for | L | Disclosure was measured by self-report questionnaire | L | Socio-demographic variable influences were accounted for. |

**Figure 2** – Risk of bias ratings for the studies included in the quantitative analysis
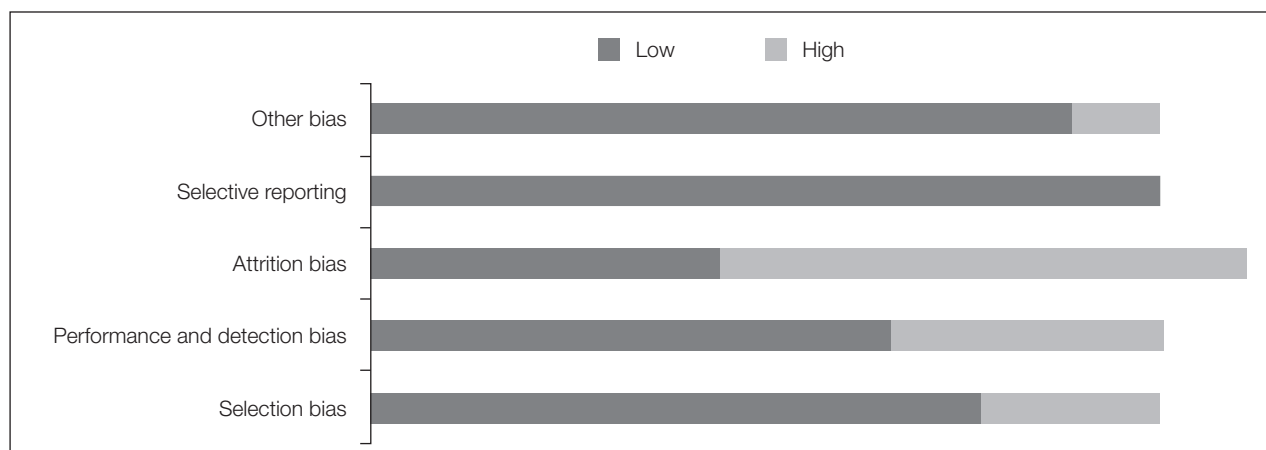
# RESULTS

## Cumulative data results

The selected articles have analyzed different numerical samples. On average, the sample size is 114 participants (Balmadrid et al., 2015; Drageset & Lindstrøm, 2005; Flory & Lang, 2011; Harding, 2014; Miller et al., 2013; Novy et al., 2001; Pineault, 2007; Ubhi et al., 1996;), Miller et al., (2014) have recluted only 50 participants. All nine selected studies examine women undergoing or waiting for breast biopsy according to our selection criteria.

### (a) Anxiety and Staff Communication

The study by Miller et al., (2013) evaluates the interaction between the pre- and post-biopsy anxiety level and the Perception of the Communication delivered by medical staff to patients. Miller, et al. (2013) have: (a) measured the patient's anxiety in pre- and post-biopsy phase; (b) examined the characteristics associated to patients' anxiety; (c) examined if the perceived physician-patient communication is associated with patients' anxiety. Researchers have confirmed that the high level of anxiety during the ultrasound-guided biopsy procedure is associated with the following factors:

– the procedure itself, since an anxiety decrease is observed after the diagnostic exam, although anxiety still remains at a high level, probably due to the uncertainty about the results;

– the patients' perception of the communication with radiologists, in terms of the clarity of the information provided: a frank communication of the details of the risks involved in the proposed procedure was associated with a low level of pre-biopsy anxiety;

– having had a previous experience of breast biopsy improves communication with radiologists, maybe because it allows to better understand the experience and the suggestions, but this condition does not appear to be associated to a low anxiety level;

– the patients' perception of the quality of the radiologist's communication seems to have a peculiar relationship with anxiety levels. The risk of receiving a diagnosis increases anxiety levels; furthermore, a higher perceived risk of receiving cancer diagnosis was found to be associated with lower perceived quality of the communication from the part of the radiologists. Thus the relationship between perceived communication and anxiety levels seems to be affected by the 'Uncertainty about the Diagnosis' variable.

In study conducted by Pineault (2007) women showed anxiety during each one of the diagnostic phases, but anxiety was exacerbated during the procedure. When the mammography screening was declared abnormal, 48% of women resulted to be very anxious, meanwhile more than half of them recorded the same anxiety levels, both while waiting for the test (51%) and while waiting for the results (53%). Anxiety was amplified by the communication of the need for further investigations such as biopsy: in this situation 62% of women appeared to be very or extremely anxious. Moreover, the anxiety level remained constant throughout the waiting period for the biopsy, until the results were obtained (Pineault, 2007). The results of the study also revealed that the emotional support of friends and family members is comforting but it does not reduce the patients' anxiety level. The satisfaction about the social support offered by health care professionals appears to be more able to reduce of the anxiety level during the diagnostic phase.

These two studies underline that there is a specific increase in anxiety levels when the need for further investigations by biopsy is communicated, the level stays high until outcome (Pineault, 2007). Social support from friends and family members is not enough to reduce anxiety, instead the support provided by the medical staff is important (Pineault, 2007). Indeed, low anxiety levels reflect the physicians' good communication skills, rather than the support of friends and family members (Miller et al., 2013; Pineault, 2007). In order to decrease anxiety in the pre-biopsy phase, women seem to need support from health care professionals during the first consultation in order to prevent the exacerbation of their preoccupations at the time of the procedure. This aspect should be appreciated in order to improve the communication quality during the biopsy procedure and the recommendations on the procedure itself (Miller et al., 2013).

### (b) Anxiety and other psychological variables

Four studies have investigated the way in which several psychological factors could be associated to anxiety levels before the breast biopsy.

Drageset & Lindstrøm (2005) found a high level of state-anxiety in women undergoing breast biopsy, comparable to what experienced by patients awaiting a surgical intervention. Authors have also examined the relationship between the following variables: (a) Demographic data, (b) Social Support,

(c) Instrumental Coping (Mastery Oriented), (d) Defensive Coping (cognitive and hostile type). In particular they have observed that a high level of *Social Support* is related to a greater use of *Instrumental Coping*, which could be effective in dealing with a potential breast cancer diagnosis. However, being good copers could lead to a better social networking. Instead, no relationship has emerged between *Social Support* and *Defensive Coping*. Women using a *Defensive coping* style before biopsy then found more difficult to cope with the breast cancer diagnosis. The authors concluded that anxiety does not result significantly related to socio-demographic variables but could be moderately reduced by the bidirectional relationship between *Social Support* and *Instrumental Coping*.

Harding (2014) explored the incidence of distress, by assessing with standardized self-report instruments the factors that would be associated with higher anxiety levels in the diagnostic phase. Results detected the presence of clinically significant anxiety levels in the diagnostic phase, also showing the presence of relevant depressive symptoms. However, the degree of a possible comorbidity between anxiety and depressions is not clear. Authors suppose that the difference among women in the presence of anxiety and depression levels is given by the possible presence of depressive symptoms before the diagnostic phase or by a difference in the reaction to this experience. Trait-anxiety has a strong impact on the distress level. Even the medical history and the eventuality of previous breast biopsies have an impact on the distress level perceived by patients: women who have previously underwent a breast biopsy showed higher anxiety level. The authors attribute the high anxiety level in this diagnostic phase to risk perception (Harding, 2014).

In a comparative study Novy and colleagues (2001) have assessed pre-biopsy anxiety. On average all the participants had elevated anxiety scores (Novy et al., 2001). Novy et al., (2001) as Harding (2014) found the trait-anxiety level of women are higher than in the general population (Novy et al., 2001).

Another study (Balmadrid et al., 2015) examined the relationship between anxiety and awaiting time from the communication of the necessity of breast biopsy to the date of it, taking in to account the impact of the *Chronic Life Stress* (CLS) variable which provides a self-report rating of chronic life stress factors in various domains, such as general or ambient problems, financial issues, work, marriage, parental concerns, social or health issues. Results showed that the CLS variable has a significant impact: if CLS level is high,

anxiety level could be relevant regardless of the awaiting time variable. Instead if variable CLS is low, the wait time will result an explanatory mediator of the increase in anxiety (Balmadrid et al., 2015).

The presented studies identify many psychological factors associated with anxiety in the diagnostic phase: the use of a *Defensive Coping* and a lower perception of *Social Support* decreases efficacy in dealing with a breast cancer diagnosis (Drageset & Lindstrøm, 2005); *Trait-Anxiety* and *Risk Perception* of a breast cancer produce an increase in distress and in pre-biopsy anxiety level (Harding, 2014; Novy et al., 2001); finally, the CLS factor seems to be relevant even in the event of a benign diagnosis. Indeed, in those who present a low level of CLS the awaiting time seems to be important to the extent that as time increases, so does anxiety. However this is only true for patients with a benign diagnosis, for patients with a malignant diagnosis anxiety remains high. The Uncertainty about the Result variable seems also important in raising anxiety (Balmadrid et al., 2015).

*(c) Anxiety and biopsy procedure*

Two randomized studies (Flory & Lang, 2011) compared the distress level among three patient groups:

a)  women with suspected breast cancer who are waiting for breast biopsy;
b)  women undergoing the invasive procedure with a potential risk for malignant liver neoplasm;
c)  women undergoing the invasive procedure with a potential diagnosis of uterine cancer.

The results showed for all three groups high mean levels of perceived distress and depressed mood, but only women who should undergo breast biopsy (Group a) reported high anxiety levels. In particular, group a reached a Mean STAI score of 48, Group b reached a Mean STAI score of 26, quite close to Group c, which reached a mean STAI score of 24. The same trend can be reported for the *Perceived Stress Scale* (*PSS*): women who should undergo breast biopsy (Group a) reported significantly higher levels of PSS (Mean = 18) when compared to Group b (Mean = 15) and Group c (Mean = 16). The result that women while waiting for biopsy were statistically significant more anxious than women who should undergo a more risky and invasive procedure was unexpected. Moreover, Flory & Lang (2011) suggest that the Invasiveness of the Procedure has less influence on patients' distress than the Uncertainty about the Result.

A correlational study (Miller et al., 2014) investigated

whether the distress before breast biopsy correlates with the quality of experience during biopsy (described in terms of pain and physical perceived discomfort during the procedure), and whether the type of experimented distress (anxiety level, worry about the procedure and the its result) would differ in relation to the quality of the experience during biopsy. Results point out that pre-biopsy worry about the procedure was significantly associated to both pain ($r = .38$, $p<.001$) and physical discomfort ($r = .31$, $p<.05$); pre-biopsy general anxiety correlated with pain ($r = .36$, $p<.001$), but not with physical dis-comfort; and pre-biopsy worry about the biopsy results did not significantly relate to pain or physical discomfort. These studies underline that anxiety is not mainly related to the level of the procedure's invasiveness, but seems to be mostly correlated to the uncertainty about the outcome and to the expectations about the result (Flory & Lang, 2011).

### (d) Anxiety and Waiting for results

A study (Ubhi et al.,1996) tried to explore the relationship between *Anxiety* and *Waiting for results* of a breast biopsy. The study contrasted an immediate communication of the results with a waiting time of week at least. Results showed that in the event of a malignant diagnosis anxiety level stays high regardless of awaiting time. In women with benign diagnosis the originally high anxiety level decreased after outcome communication. Therefore, it is important to reduce the waiting time since an immediate diagnosis communication in the event of benign biopsy is beneficial (Ubhi et al., 1996); furthermore, immediate communication is important also in the event of a malignant diagnosis, though anxiety levels do not seem to decrease.

## CONCLUSIONS

In the present paper we provide an homogeneous description of all the studies that assessed pre- and post-operative anxiety levels in women undergoing breast biopsy was achieved and the investigated the psychosocial and situational factors and the psychological variables that appear to influence them. Overall, the most relevant among them were found to be Perceived Communication, Perceived Risk of a diagnosis, Invasiveness of the Procedure, Perceived Support from the staff, Trait-Anxiety, Chronic Life Stress (CLS) and inability to take advantage of an Instrumental

Coping, which in the oncologic contest seems to be more functional (Drageset & Lindstrøm, 2005).

There is evidence that the quality of the communication with the health care providers is able to influence the experience of undergoing a breast biopsy; however the perceived risk of receiving a cancer diagnosis seems to reduce the benefit of a good communication between the radiologists and the patients.

The staff members are found to provide reliable support to women undergoing breast biopsy; in particular women report to experience less anxiety when they receive emotional and informative support from the staff members than when being supported by non-professional caregivers. However the benefit obtained from support by professionals is less evident in the case of malignant diagnosis. This evidence suggests that more efforts should be made in monitoring the quality of support provided to patients by the staff members in the case of a threatening outcome of the biopsy. The examined literature confirms that *Trait Anxiety* and *Chronic Life Stress* (CLS) are good predictors of situational anxiety for women undergoing breast biopsy; in particular CLS is associated with higher level biopsy anxiety levels even in women with a probable benign outcome. All the socio-demographic predictors that were empirically evaluated failed to reach significance. Two empirical studies evaluated the relationship between Preoperative Anxiety levels and Invasiveness of the Procedure, showing that (1) anxiety is higher in patients undergoing biopsy rather than in patients undergoing more invasive procedures, and (2) the Uncertainty about the Diagnosis variable has a stronger influence on anxiety levels in women undergoing breast biopsy than in women undergoing others type of diagnostic procedures. Infact a second study found that worry is the most reliable predictor of Distress (in terms of anxiety, preoccupation for the procedure and for the result) and the "Physical Discomfort" in women undergoing breast biopsy.

## Implications for clinical practice

From our review, the factors that are found to influence in a relevant way anxiety levels related to breast biopsy are different. Some of them are individual factors, such as *Trait Anxiety* and *Chronic Life Stress*, which cannot be effectively manipulated with specific psychological interventions.

Some other variables, such as the worry and uncertainty

about the results, are intrinsically related to the diagnostic phase and cannot be treated with empirical manipulations. On the contrary the other relevant variables can be considered as suitable targets for interventions aiming to reduce anxiety levels. In particular, best practices should include careful efforts to reduce the waiting time for results to the minimum possible level and patients should be made aware of this. Furthermore the staff members should became aware that in this very delicate phase of the diagnostic process, the perceived support from their part is considered by the patients to be more effective than the one perceived from friends and relatives. Professionals should therefore take responsibility for that, and should ask for more suitable psychological tools to provide this type of support.

Finally, the quality of the communication should also be constantly monitored. In particular attention should be provided to different aspects, such as the clarity and the completeness of the provided information, the real comprehension of the communicated information from the part of the patients and the emphatic concern of the emotional state of the patients.

In line with these considerations, tailored psychological interventions could target both pre-operative anxiety levels in the patients and all the organizational and relational competences of the staff members that were shown to critically influence the experience of women undergoing breast biopsy.

## Limitations

On the basis of the consideration of the PRISMA criteria, recruitment was adequate in eight trials, while in two studies the allocation of participants to groups was not described.

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# Love Attitudes Scale - Short form: The preliminary assessment of the factor structure of its Italian version

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♟ ABSTRACT. In questo articolo viene proposta una preliminare valutazione psicometrica della versione italiana del *Love Attitudes Scale: Short Form* (LAS; Hendrick, Hendrick & Dicke, 1998), una delle più utilizzate misure dell'amore. I risultati confermano la struttura a sei fattori della scala e la sua validità convergente con alcune dimensioni della relazione di coppia. Sono state rilevate anche differenze di genere in vari stili amorosi. Si conferma l'utilità dello strumento.

♟ SUMMARY. *This study aims to make a preliminary evaluation of the psychometric features of the Italian version of the Love Attitudes Scale: Short Form (LAS; Hendrick, Hendrick & Dicke, 1998), which is one of the most commonly used measurements of love in literature. Our results confirmed the six-factor structure and its convergent validity with several affective dimensions (e.g., intimacy, fear of intimacy, sexuality, relational talk) in couple relationships and marital satisfaction (dyadic and familial). For discriminant validity, there were gender differences in several love styles. Our findings indicated that this tool might be useful in both scientific and clinical contexts when used in the Italian framework.*

**Keywords:** *Factor structure, Psychometric proprieties, Love styles, Love Attitudes Scale - Short Form*

## INTRODUCTION

Since Kephart's work in 1967 (Kephart, 1967) which examined whether love was important for marriage, romantic love has been considered essential for marriage and marital quality. Scholars have distinguished different experiences of love, such as passionate, companionate, romantic, and adult-attachment love (Berscheid, 2010) and various love attitudes or styles (Lee, 1973), as well as

assessing immature and pathological ways to live love (Doron, Derby & Szepsenwol, 2014).

Interest in the different experiences of love has brought not only fruitful findings and theoretical models, but also a number of useful measurements for quantifying these experiences. Among these, the *Love Attitudes Scale: Short Form* (LAS; Hendrick et al., 1998) is one of the most widely used and validated tools in many countries. In Italy, it received attention in a first empirical validation

in a sample of people aged between 20 and 30 (Ortalda & Canale, 2010).

Considering the importance of this tool and the lack of its systematic empirical validation in Italy, the main aim of our study is to make a first validation with an Italian sample and verify its factorial structure. In addition, we intend to verify the association between love styles and some key dimensions of marital quality, such as affectivity and satisfaction. In this regard, we assess the construct validity while relying on convergent and discriminant validity.

## Background

Lee (1973) conceptualized the nature of love through colors that correspond to specific typologies of love styles. He proposed that different attitudes toward love influence emotions and behavior and can be classified in six styles: Eros, Ludus and Storge (the primary styles), and Mania, Pragma and Agape (the secondary styles). The primary styles are characterized by passion, physical and emotional attraction and commitment (*Eros style*); game playing and uncommitted love (*Ludus style*); and friendship and companionship-driven love (*Storge style*). The secondary styles are derived by combining features of the primary styles: for instance, the union of Eros and Ludus results in the *Mania style*, which is connoted by an insecure and dependent experience of love (Hendrick & Hendrick, 1986); the combination of Ludus and Storge leads to the *Pragma style*, which is a rational love style; and the *Agape style*, an altruistic and selfless style of love, is the result of the combination of Eros and Storge.

Several of these styles correspond to other love taxonomies in psychological literature, such as that proposed by Berscheid (2010), who distinguished among *romantic* (passionate), *companionate* (friendship), *compassionate* (altruistic), and *attachment* love (strong affective bonds). The Storge style is often used as a measure of companionate love, and Agape and compassionate love are similar concepts in close relationships (Fehr, Sprecher, Hojjat, & Cramer, 2013). Scholars have also delineated the association between love styles through specific pathological love pathways, such as the *Relationship Obsessive Compulsive Disorder* (*ROCD*; Doron et al., 2014). ROCD includes preoccupations and doubts about one's own intimate relationships and partners and is thus closely related to the Mania style (Graham, 2011).

In addition, the Mania and Agape styles are similar to the concept of Pathological love (PL), which is characterized by an excessive need to remain with the partner and provide attention and care for him/her to the detriment of one's own personal interests.

Following Lee's proposal, several empirical studies have examined the existence and consistence of these love styles and their relation to different variables in cultural and personal dimensions. Several cross-cultural comparative studies (Kanemasa et al., 2004; Neto, 2007) have supported the six dimensions of love proposed by Lee (1973).

With regard to gender differences, while some research has found that men accept more the Eros, Ludus and Agape love styles, and women prefer the Pragma style and companionate love, others have failed to obtain similar results (Wan Shahrazad, Hoesni, & Chong, 2012).

Research has found that love styles influence relationship behavior and feelings (Levine, Aune & Park, 2006) and have different effects on the partners' relationship. In fact, the Eros, Agape and Storge styles are related to positive features in the couple's relationship, whereas the Ludus, Mania and Pragma types reflect negative aspects of the marriage. For instance, using couples, Morrow, Clark & Brock (1995) found that partners who had the Eros and Agape styles expressed more marital satisfaction, commitment, lower costs and poorer alternative qualities than did partners who preferred the Ludus style. In addition, scholars found that Eros and Agape are the strongest predictors of relationship satisfaction (Vedes et al., 2016), whereas the Ludus style was negatively associated with marital satisfaction and stability (Goodboy & Myers, 2010). The Eros style distinguished individuals who had secure attachment, whereas the Ludus style reflected avoidant attachment and the Mania style was related to an anxious/resistant attachment style (Fricker & Moore, 2002; Levy & Davis, 1988). Among undergraduate students, Kanemasa et al. (2004) found that Eros was typical of people who expressed positive feelings and self-perceptions, Ludus and Pragma characterized people with negative feelings in romantic relationships, and Ludus was related to less attraction toward the partner. Goodboy, Horan & Booth-Butterfield (2012) found that the Ludus and Mania styles positively predicted jealousy-evoking behavior, and Attridge (2013) determined that Mania was primarily associated with jealousy.

In some cases, the associations between love styles and aspects of marital quality appear to change after accounting for gender differences. For example, Vedes et al. (2016) found

that both the Eros and Agape styles had positive effects on support for the partner and dyadic coping (partners who cope with a joint stressor together), but that the Ludus style was detrimental for relationship satisfaction for women and not men. Generally, scholars have observed a more frequent Agape style in men than in women (Regan, 2016).

## Measuring love and love styles

Hatfield, Bensman and Rapson (2012) proposed a compendium of the existing scales on passionate love. They observed how scholars' conceptions of the nature of love have changed over the years and how these historical and scientific changes are reflected in the scales designed to measure it. Currently, scholars often view love from a narrow theoretical perspective and assume that it is a multi-faceted phenomenon.

Although several measurements of love experiences are ad-hoc tools for research objectives (Sprecher & Hatfield, 2017) or qualitative measurements such as the narrative method (Gawda, 2012), many additional validated scales have been constructed from Lee's love theory (1973). Among the most popular tools, there are the *Passionate Love Scale* (*PLS*; Hatfield & Sprecher, 1986), which assesses the physiological, cognitive, and behavioral aspects of love types, and the *Triangular Love Scale* (*TLS*; Sternberg, 1997), which assesses the three love components (passion, intimacy, commitment) recognized by the author (for a review of love measures, see Hatfield et al., 2012). There are also specific tools that assess specific aspects and types of love. For instance, Sprecher and Fehr (2005) developed a compassionate love scale that assesses altruistic love in all close relationships. They observed many associations of this scale with social and relationship dimensions, including prosocial behavior, religion, and social support.

Today, among the most popular and used scales of love measurements, there is the *Love Attitudes scale* (Hendrick & Hendrick, 1986), which assesses the six types of love (Eros, Ludus, Storge, Pragma, Mania, Agape) based on Lee's theory. Given the criticism about the clarity of the focus of the measurement on general or specific relationships, Hendrick and Hendrick (1990) developed the relationship version of the LAS but found that the two tools were equivalent. The original scale included 42 items. Hendrick et al. (1998) also created two short versions of the LAS. The short forms assessed the

six types of love: the first version included 18 items (three items for each love type), and the second included 24 items (four items for each love type). The scholars found that these two short forms had stronger psychometric properties than the original LAS (Hendrick et al., 1998).

The most frequently used version is the LAS 24-item short form that has established reliability and validity (Hendrick & Hendrick, 1986, 1990; Hendrick et al., 1998) across cultural contexts, as attested by Wan Shahrazad et al. (2012). Researchers have proposed several revisions to the LAS. Bierhoff, Grau and Ludwig (1993) developed a German adaptation, which resulted in the *Marburg Attitude Scales toward Love Styles* (*MEIL*) with 60 items (e.g., Vedes et al., 2016). Todosijević, Arančić and Ljubinković (2009) reviewed the LAS in Serbia and introduced new items.

## AIMS

The purpose of this study was to investigate the psychometric proprieties of the LAS-Short form (Hendrick et al., 1998) in this Italian version in a sample of adults. This instrument was chosen because it is widely used in the clinical and academic contexts and has been adapted to many different cultures, showing good psychometric proprieties (Kanemasa et al., 2004; Neto, 2007; Wan Shahrazad et al., 2012). The absence of data related to the application of LAS in the Italian context might be considered a difficulty in the assessment of couple relationships in academic and clinical research.

## METHOD

### Participants

The participants consisted of 415 Italian citizens (women 50.1%), aged from 19 to 70 years ($M_{age}$ = 40.15; $SD_{age}$ = 11.92), of whom 32.2% were college graduates, 49.8% had a high school education, 18% had a lower school education; 92% were employed. Furthermore, 63.7% of participants were in the mid-socio-economic range. Overall, 59.1% were married; 20.8% were cohabiting (mean years of cohabitation = 12.04 ± 12.27), and 20.1% were not cohabiting. Additionally, 57.9% of the participants had children. The sampling strategy was non-probabilistic (a convenience sample), and participants took part in the

study on a voluntary basis after providing written consent. To obtain consent, qualified researchers informed them of the aim of the study. They were recruited in Tuscany with the collaboration of a group of professional clinicians; they did not receive any incentive for their participation. The response rate was approximately 80% of the individuals contacted. In order to be included in the study, they had to be engaged in a stable heterosexual relationship for almost six months and be Italian citizens from birth.

## Materials and procedure

Participants were required to fill in a battery of self-report measurements that were individually managed. The questionnaires, which were administered in a paper-and-pencil format and compiled in a quiet room in the presence of a trained researcher, took approximately 30 minutes to complete.

The battery was structured in several sections.

Participants first reported socio-demographic characteristics (age, educational attainment, residence, socioeconomic status) and aspects related to familiar relationships (type of relationship, length of relationship, presence of children).

– *Love Attitudes Scale-Short Form (LAS-SF)* - Following, they completed the Italian Love Attitudes Scale-Short form (LAS-SF) (Hendrick et al., 1998). This 24-item questionnaire assesses different aspects of love behavior that reflect love styles. The original questionnaire identified six dimensions (Eros, Ludus, Storge, Pragma, Mania and Agape), for which the Alpha reliability coefficients ranged from .71 to .84 in the research of White, Hendrick and Hendrick (2004). For each sentence, participants were asked to respond according to a five-point Likert scale (from 0 to 4), for which a low score corresponded to higher agreement with the statement. Examples of items for each dimensions included: "My partner and I have the right physical 'chemistry' between us" (*Eros*); "I enjoy playing the 'game of love' with my partner and a number of other partners" (*Ludus*); "Our love is really a deep friendship, not a mysterious, mystical emotion" (*Storge*); "One consideration in choosing my partner was how he/she would reflect on my career" (*Pragma*); "When my partner doesn't pay attention to me, I feel sick all over" (*Mania*); "I would rather suffer myself than let my partner suffer" (*Agape*). An Italian

translation of the LAS-SF was presented; this version was back-translated into English by a native English speaker. The back-translation and the original English version were matched and discrepancies were clarified during a discussion between the translators (Brislin, 1986).

– *Dyadic-Familial Relationship Satisfaction Scale (DFRS)* - The next section included the Dyadic-Familial Relationship Satisfaction Scale (DFRS; Raffagnino & Matera, 2015), with 14 items, measured according to a Likert scale (from 0 to 4), which measure Dyadic satisfaction (Alpha = .95) and Familial satisfaction (Alpha = .91). For the dyadic dimension, 13 domains were identified such as relationship stability, support, comprehension, respect, and communication of feelings, while for the familial dimension, six domains were covered including familial responsibility and commitment, house management, and family roles. The introductory statement asks: "Below are some areas related to life as a couple. Please think about your current relationship and express your degree of satisfaction with each area".

– *The Couple's Affectivity Scale (CAS)* - The last section was the Couple's Affectivity Scale (CAS; Raffagnino & Penzo, 2015) that has 39 items structured in eleven factors; their reliability ranged from .73 to .90. The factors were:

◆ Self-Disclosure (SD) regarding the person's availability to be open to express feelings, fear, information to his/her partner ("During the past month, how frequently have you expressed your fears to your partner?");

◆ Partner Disclosure (PD) related to the person's perception of the partner's ability to express his/her thoughts and ideas, feelings and love ("During the past month, how frequently has your partner openly expressed his/her positive feelings towards you?");

◆ Perceived Partner Responsiveness (PPR) concerning the perception of comprehension, affect, esteem and protection received from the partner ("During the past month, how frequently has your partner demonstrated understanding towards you?");

◆ Relational communication (RC) measured the partner's attitude to talk with the other about their relationship ("During the past month, how frequently have you told your partner what you want from your relationship?");

◆ Relational Fears (RF) included the fears of emotional involvement (FEIN/ "During the past month, how frequently have you felt afraid to express yourself to your partner?"); the fears of being abandoned and

rejected (FAR/ "During the past month, how frequently have you experienced fear of being alone?"); the fears of dependency and control (FDC/ "During the past month, how frequently have you experienced fear of being controlled by your partner?");

◆ Sexual Behaviors (SB) involved physical attraction and sexual satisfaction (PASS/ "During the past month, how frequently have you felt physically attracted to your partner?"); anxiety and sexual inhibition (ASI), regarding both the worry about sexual performance and the difficulty of speaking about sexuality ("During the past month, how frequently have you experienced sexual difficulties and, if so, do you tend to ignore them for a long time before saying something?"); partner initiative (PI) concerning the initiative in sexual intercourse ("During the past month, how frequently have you wanted to have sexual intercourse with your partner?");

◆ Closeness-Distance between Partners (CDP) was measured by means of a graphic representation "The Intimacy Line" (Raffagnino & Occhini, 2000) that allows the respondent to express his/her perception about the physical and emotional closeness-distance to their partner, as well as the respondent's perception about the partner's physical and emotional closeness-distance to them.

For all dimensions, participants indicated their answers using a five points Likert-type scale, ranging from never (0) to always (4), with the exception of one item of the PASS, implying the frequency measure of sexual intercourse (ranging from 0 = none, to 7 = several times a day) and of the CDP using a six points Likert-type scale (ranging from 0 = maximum closeness to 5 = maximum distance).

In addition, two supplementary items assessed happiness and satisfaction in the dyadic relationship, and participants reported the extent to which each statement was true on a scale from 0 (not at all) to 4 (extremely).

## Data analysis

Statistical analyses were conducted using R 3.4.1 and EQS software (v 6.3; Bentler, 1995).

First, item distributions were checked for normality and statistical analyses were performed based on these assessments. In order to evaluate the construct validity, the Confirmatory Factor Analysis (CFA) was applied to assess the original first-order factor structure, having six factors.

Because the variables had a nonsymmetrical curve and a non-normal multivariate distribution, we used a robust estimator to perform the Confirmatory Factor Analysis (CFA), the Elliptical Least Square Solution (ELS), which uses the covariance matrix. The factor variance was set to 1.0, and the factor loadings were freely estimated (Kline, 2015).

To evaluate the goodness-of-fit, the indications of Hu and Bentler's (1999) and Schermelleh-Engel Moosbrugger and Müller (2003) were applied. Specifically, we used the following criteria: a ratio $\chi^2/df$<2 was defined as good, a ratio $\chi^2/df$<3 as tolerable; acceptable fit values for the GFI, AGFI and CFI were ≥.90; a RMSEA ≤.08 and a SRMR ≤.08 denoted a satisfactory fit, a NNFI between .97 and ≤1.00 indicated a good fit; and a NNFI between .95 and .97 implied a suitable fit.

Reliability was assessed using the Cronbach's Alpha coefficient.

To demonstrate construct validity, Pearson's correlations coefficients were computed between the LAS scales and dimensions from the Couple's Affectivity Scale (CAS) (Raffagnino & Penzo, 2015) and the Dyadic-Familial Relationship Satisfaction Scale (DFRS) (Raffagnino & Matera, 2015); these data might provide evidence for convergent and discriminant validity (Shaughnessy, Zechmeister & Zechmeister, 2012).

Indeed, whereas the LAS measures love attitudes, the other measurements assess the individual's actual experiences in intimate relationships for the couple's affective expression and the partner's perceptions of relational satisfaction. Therefore, the LAS and CAS allowed us to examine two psychological aspects of the affective dimension of the couple's relationship: attitude and experience. The LAS and DFRS allowed us to evaluate the relationship between love styles and perceptions of marital quality, as measured through relational satisfaction.

Specifically, on the basis of the most recent findings in literature, it is assumed that some dimensions of the LAS (e.g. Eros, Agape and Storge styles) might have a positive correlation with the dimensions of dyadic and familial satisfaction and affectivity; while other dimensions of LAS (e.g. Ludus, Mania and Pragma) may have a negative correlation with these relational variables.

Moreover, to assess the discriminant validity of the LAS-SF Italian version, we evaluated the differences in the LAS factor scores in relation to the gender of participants.

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## RESULTS

We tested a CFA model, including 24 items and six first-order factors (based on the original version of the LAS-SF; Hendrick, et al., 1998). The CFA had an acceptable fit (see Table 1). All items except one loaded onto their respective factors; however, item 5 had a low standardized factor loading on the Ludus factor (see Table 2). The remaining items had good factor loadings on their respective factors, which confirmed the original factorial structure (Hendrick et al., 1998). Given the aforementioned recommendations for evaluating CFA models, there were a few problems. The NNFI had values <.95; and the GFI and AGFI were <.90. It is important to consider that $\chi^2$, GFI and AGFI are affected by sample size and the degrees of freedom; thus, one cannot completely rely on these indicators (Sharma, Mukherjee, Kumar & Dillon, 2005). The reliabilities for the dimensions were adequate; only the Ludus factor had a poor Cronbach's Alpha ($\alpha$ = .450), which improved after deleting item 5 ($\alpha$ = .713).

To assess convergent and discriminant validity, we computed Pearson's $r$ correlations between the LAS-SF factors and the other measurements (i.e., CAS, DFRSS, Satisfaction and Happiness). Coherently with the results of previous CFA and reliability analyses, the Ludus score included items 6, 7 and 8 from the LAS-SF. To evaluate these coefficients, agreement with the statements was characterized by a low score on the Likert scale (0 = strongly agree), whereas disagreement was characterized by a higher score (4 = strongly disagree). In order to account for multiple correlation assessments, we considered the linear relationships of the indices having a $p$ value lower than .0001 as relevant. The bivariate linear correlations were first assessed for the total sample (see Table 3a), then separately for males and females (see Table 3b and Table 3c).

The total score of Eros had a significant positive correlation with Agape and the CAS dimensions of CDP (Closeness-distance between partners), FDC (Fear of dependence and control), FEIN (Fear of emotional involvement), FAR (Fear of abandonment and rejection), and ASI (Anxiety and sexual inhibition), which ranged from .178 to .365. Moreover, Eros had a significant negative correlation with Ludus, DFRSS Dyadic Satisfaction, DFRSS Familial Satisfaction, with the item of general Perception of Couple Satisfaction and Happiness and with the CAS dimensions of PD (Partner disclosure), PPR (Perceived partner responsiveness) and PASS (Physical attraction and sexual satisfaction), which ranged from −.240 to −.462.

While Ludus had a significant negative linear relation with CAS-FDC and CAS-FEIN (ranging from −.109 to −.219) it had a significant positive correlation with Storge, Pragma, Mania and the CAS dimension of SD (ranging from .171 to .453).

Storge was positively related to Pragma ($r$ = .413).

Pragma was positively correlated with Mania ($r$ = .345).

The LAS-SF Mania was positively associated with Agape ($r$ = .320).

Finally, Agape was negatively and significantly related to the CAS dimensions of PPR, PASS and the general Perception of Couple Satisfaction and Happiness (ranging from −.192 to −.207).

As regards the male sample (see Table 3b), we found various correlations, mainly in the Eros dimension, and also in Ludus. In particular, Eros had a significant and positive correlation with Agape and the CAS dimensions of CDP (Closeness-distance between partners), FDC (Fear of dependence and control), FEIN (Fear of emotional involvement), FAR (Fear of abandonment and rejection), and ASI (Anxiety and sexual inhibition) (ranging from .288 to .302). It also had a significant and negative correlation with Ludus, Pragma, DFRSS Dyadic Satisfaction, PPR (Perceived partner responsiveness), PASS (Physical attraction and sexual satisfaction), and with the item of general Perception of Couple Satisfaction and Happiness (ranging from −.302 to −.400).

**Table 1** – Goodness-of-fit indices for two CFA models

| df | $\chi^2$ | $\chi^2$/df | p | RMSEA | RMSEA [90%CI] | SRMR | NNFI | CFI | GFI | AGFI |
|---|---|---|---|---|---|---|---|---|---|---|
| 221 | 541.164 | 2.44 | .0001 | .061 | .054, .067 | .073 | .938 | .950 | .886 | .846 |

*Legenda. df* = degrees of freedom; $\chi^2$ = Chi Square; RMSEA [90% CI] = Root Mean Square Error of Approximation with Confidence Interval; SRMR = Standardized Root Mean Square Residual; NNFI = Non-normed Fit Index; CFI = Comparative Fit Index; GFI = Goodness-of- Fit; AGFI = Adjusted Goodness-of- Fit Index.

**Table 2** - CFA standardized factor loadings for 24-item version of LAS

| | Mean | SD | F1 | F2 | F3 | F4 | F5 | F6 |
|---|---|---|---|---|---|---|---|---|
| 1. My partner and I have the right physical "chemistry" between us. | .77 | 1.02 | .820 | | | | | |
| 2. I feel that my partner and I were meant for each other. | .79 | 1.05 | .922 | | | | | |
| 3. My partner and I really understand each other. | .95 | 1.01 | .807 | | | | | |
| 4. My partner fits my ideal standards of physical beauty/handsomeness. | .86 | 1.02 | .682 | | | | | |
| 5. I believe that what my partner doesn't know about me won't hurt him/her. | 1.49 | 1.31 | | **.193** | | | | |
| 6. I have sometimes had to keep my partner from finding out about other partners. | 3.24 | 1.41 | | -.767 | | | | |
| 7. My partner would get upset if he/she knew of some of the things I've done with other partners. | 2.60 | 1.52 | | -.461 | | | | |
| 8. I enjoy playing the "game of love" with my partner and a number of other partners. | 3.40 | 1.28 | | -.803 | | | | |
| 9. Our love is the best kind because it grew out of a long friendship. | 2.50 | 1.43 | | | .748 | | | |
| 10. Our friendship merged gradually into love over time. | 2.53 | 1.52 | | | .847 | | | |
| 11. Our love is really a deep friendship, not a mysterious, mystical emotion. | 2.97 | 1.35 | | | .696 | | | |
| 12. Our love relationship is the most satisfying because it developed from a good friendship. | 2.69 | 1.40 | | | .913 | | | |
| 13. A main consideration in choosing my partner was how he/she would reflect on my family. | 2.95 | 1.37 | | | | .581 | | |
| 14. An important factor in choosing my partner was whether or not he/she would be a good parent. | 2.20 | 1.49 | | | | .456 | | |
| 15. One consideration in choosing my partner was how he/she would reflect on my career. | 3.21 | 1.27 | | | | .784 | | |
| 16. Before getting very involved with my partner, I tried to figure out how compatible his/her hereditary background would be with mine in case we ever had children. | 3.45 | 1.20 | | | | .860 | | |
| 17. When my partner doesn't pay attention to me, I feel sick all over. | 2.01 | 1.26 | | | | | .441 | |
| 18. Since I've been in love with my partner, I've had trouble concentrating on anything else. | 2.81 | 1.29 | | | | | .683 | |
| 19. I cannot relax if I suspect that my partner is with someone else. | 2.21 | 1.53 | | | | | .632 | |
| 20. If my partner ignores me for a while, I sometimes do stupid things to try to get his/her attention back. | 2.73 | 1.34 | | | | | .705 | |
| 21. I would rather suffer myself than let my partner suffer. | 1.36 | 1.28 | | | | | | .786 |
| 22. I cannot be happy unless I place my partner's happiness before my own. | 1.75 | 1.26 | | | | | | .806 |
| 23. I am usually willing to sacrifice my own wishes to let my partner achieve his/hers. | 1.79 | 1.17 | | | | | | .804 |
| 24. I would endure all things for the sake of my partner. | 1.80 | 1.35 | | | | | | .746 |
| Alpha Reliability | | | .878 | .450 | .872 | .779 | .703 | .862 |

*Note.* F1: EROS; F2: LUDUS; F3: STORGE; F4: PRAGMA; F5: MANIA; F6: AGAPE.
The factor loading in bold was not significant.

**Table 3a** – Pearson's r correlations between LAS-SF and other variables

|  |  | LAS-F1 | LAS-F2 | LAS-F3 | LAS-F4 | LAS-F5 | LAS- F6 |
|---|---|---|---|---|---|---|---|
| LAS-EROS-F1 | r | / |  |  |  |  |  |
|  | p |  |  |  |  |  |  |
| LAS-LUDUS-F2 | r | −.356*** | / |  |  |  |  |
|  | p | .0001 |  |  |  |  |  |
| LAS-STORGE-F3 | r | −.077 | .261*** | / |  |  |  |
|  | p | .118 | .0001 |  |  |  |  |
| LAS-PRAGMA-F4 | r | −.185*** | .453*** | .413*** | / |  |  |
|  | p | .0001 | .0001 | .0001 |  |  |  |
| LAS-MANIA-F5 | r | −.143** | .261*** | .147** | .345*** | / |  |
|  | p | .003 | .0001 | .003 | .0001 |  |  |
| LAS-AGAPE-F6 | r | .246*** | −.060 | .011 | .170** | .320*** | / |
|  | p | .0001 | .219 | .818 | .001 | .0001 |  |
| DFRSS-DYADIC SATISFACTION | r | −.462*** | .155** | −.048 | .013 | .060 | −.163** |
|  | p | .0001 | .002 | .328 | .786 | .226 | .001 |
| DFRSS-FAMILIAL SATISFACTION | r | −.307*** | .065 | −.063 | −.020 | .009 | −.178** |
|  | p | .0001 | .223 | .231 | .711 | .870 | .001 |
| CAS-PD | r | −.240*** | .066 | .005 | −.003 | −.008 | −.092 |
|  | p | .0001 | .178 | .913 | .949 | .869 | .060 |
| CAS-FDC | r | .304*** | −.219*** | −.027 | −.060 | −.144** | .057 |
|  | p | .0001 | .0001 | .586 | .225 | .003 | .246 |
| CAS-PPR | r | −.391*** | .119* | −.026 | .015 | −.047 | −.196*** |
|  | p | .0001 | .015 | .601 | .766 | .338 | .0001 |
| CAS-SD | r | −.142** | .171*** | −.006 | .026 | −.094 | −.028 |
|  | p | .004 | .0001 | .910 | .601 | .056 | .570 |
| CAS-PASS | r | −.326*** | .108* | −.017 | .028 | .028 | −.192*** |
|  | p | .0001 | .027 | .725 | .571 | .572 | .0001 |
| CAS-FEIN | r | .297*** | −.195*** | .018 | −.029 | −.109* | .110* |
|  | p | .0001 | .0001 | .709 | .557 | .027 | .025 |
| CAS-RC | r | −.031 | .000 | −.050 | −.011 | −.113* | −.081 |
|  | p | .530 | .993 | .310 | .824 | .021 | .099 |
| CAS-CDP | r | .365*** | −.140** | −.021 | −.031 | −.075 | .125* |
|  | p | .0001 | .006 | .682 | .541 | .142 | .013 |
| CAS-FAR | r | .193*** | −.109* | −.054 | −.054 | −.150* | −.005 |
|  | p | .0001 | .026 | .274 | .269 | .002 | .919 |
| CAS-ASI | r | .178*** | −.135** | −.052 | −.079 | −.147** | .024 |
|  | p | .0001 | .006 | .294 | .110 | .003 | .619 |
| CAS-PI | r | −.031 | .056 | .047 | −.007 | −.022 | .121* |
|  | p | .535 | .252 | .335 | .893 | .655 | .014 |
| HAPPINESS | r | −.403*** | −.121* | −.018 | −.015 | .039 | −.195*** |
|  | p | .0001 | .013 | .718 | .760 | .431 | .0001 |
| SATISFACTION | r | −.414*** | −.140** | −.039 | −.010 | .071 | −.207*** |
|  | p | .0001 | .004 | .426 | .840 | .152 | .0001 |

*Note.* CAS-PD: Partner disclosure; CAS-FDC: Fear of dependence and control; CAS-PPR: Perceived partner responsiveness; CAS-SD: Self-disclosure; CAS-PASS: Physical attraction and sexual satisfaction; CAS-FEIN: Fear of emotional involvement; CAS-RC: Relational communication; CAS-CDP: Closeness-distance between partners; CAS-FAR: Fear of abandonment and rejection; CAS-ASI: Anxiety and sexual inhibition; CAS-PI: Partner initiative.
* *p*≤.05; ** *p*≤.01; *** *p*≤.001.

**Table 3b** – Pearson's r correlations between LAS-SF and other variables - Males

|  |  | LAS-F1 | LAS-F2 | LAS-F3 | LAS-F4 | LAS-F5 | LAS-F6 |
|---|---|---|---|---|---|---|---|
| LAS-EROS-F1 | r | / |  |  |  |  |  |
|  | p |  |  |  |  |  |  |
| LAS-LUDUS-F2 | r | −.400*** | 1 |  |  |  |  |
|  | p | .0001 |  |  |  |  |  |
| LAS-STORGE-F3 | r | −.189** | .310*** | 1 |  |  |  |
|  | p | .007 | .0001 |  |  |  |  |
| LAS-PRAGMA-F4 | r | −.302*** | .514*** | .453*** | 1 |  |  |
|  | p | .0001 | .0001 | .0001 |  |  |  |
| LAS-MANIA-F5 | r | −.226** | .311*** | .171* | .458*** | 1 |  |
|  | p | .001 | .0001 | .014 | .0001 |  |  |
| LAS-AGAPE-F6 | r | .302*** | −.205** | −.123 | .064 | .220** | 1 |
|  | p | .0001 | .003 | .080 | .364 | .002 |  |
| DFRSS-DYADIC SATISFACTION | r | −.381*** | .215** | .065 | .072 | .059 | −.143* |
|  | p | .0001 | .002 | .358 | .302 | .400 | .040 |
| DFRSS-FAMILIAL SATISFACTION | r | −.228** | .178* | −.006 | .033 | .022 | −.157* |
|  | p | .002 | .019 | .941 | .664 | .777 | .038 |
| CAS-PD | r | −.188** | .061 | .088 | .021 | −.085 | −.131 |
|  | p | .007 | .383 | .210 | .763 | .224 | .060 |
| CAS-FDC | r | .288*** | −.202** | −.067 | −.015 | −.125 | .123 |
|  | p | .0001 | .004 | .343 | .834 | .074 | .079 |
| CAS-PPR | r | −.327*** | .144* | .078 | .062 | −.003 | −.203** |
|  | p | .0001 | .040 | .263 | .378 | .967 | .004 |
| CAS-SD | r | −.126 | .087 | .002 | .022 | −.117 | −.084 |
|  | p | .073 | .212 | .978 | .751 | .096 | .233 |
| CAS-PASS | r | −.313*** | .139* | .064 | .079 | .005 | −.231** |
|  | p | .0001 | .047 | .361 | .259 | .938 | .001 |
| CAS-FEIN | r | .358*** | −.255*** | −.049 | −.103 | −.049 | .197** |
|  | p | .0001 | .0001 | .489 | .140 | .489 | .005 |
| CAS-RC | r | −.035 | .051 | −.026 | .022 | −.120 | −.104 |
|  | p | .615 | .465 | .716 | .752 | .087 | .138 |
| CAS-CDP | r | .309*** | −.198** | −.187** | −.117 | −.113 | .085 |
|  | p | .0001 | .006 | .009 | .106 | .117 | .242 |
| CAS-FAR | r | .295*** | −.154* | −.058 | −.114 | −.160* | .056 |
|  | p | .0001 | .027 | .407 | .104 | .022 | .427 |
| CAS-ASI | r | .288*** | −.251*** | −.084 | −.123 | .0001 | .141* |
|  | p | .0001 | .0001 | .229 | .080 | .996 | .044 |
| CAS-PI | r | −.040 | −.012 | −.098 | −.064 | .015 | .058 |
|  | p | .567 | .869 | .163 | .359 | .827 | .410 |
| HAPPINESS | r | −.396*** | .193** | .119 | .064 | .035 | −.200** |
|  | p | .0001 | .005 | .090 | .362 | .623 | .004 |
| SATISFACTION | r | −.357*** | .161* | .078 | .035 | .016 | −.219** |
|  | p | .0001 | .022 | .271 | .615 | .818 | .002 |

*Note.* CAS-PD: Partner disclosure; CAS-FDC: Fear of dependence and control; CAS-PPR: Perceived partner responsiveness; CAS-SD: Self-disclosure; CAS-PASS: Physical attraction and sexual satisfaction; CAS-FEIN: Fear of emotional involvement; CAS-RC: Relational communication; CAS-CDP: Closeness-distance between partners; CAS-FAR: Fear of abandonment and rejection; CAS-ASI: Anxiety and sexual inhibition; CAS-PI: Partner initiative.
* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$.

**Table 3c** – Pearson's r correlations between LAS-SF and other variables - Females

|  |  | LAS-F1 | LAS-F2 | LAS-F3 | LAS-F4 | LAS-F5 | LAS-F6 |
|---|---|---|---|---|---|---|---|
| LAS-EROS-F1 | r | / |  |  |  |  |  |
|  | p |  |  |  |  |  |  |
| LAS-LUDUS-F2 | r | −.301*** | 1 |  |  |  |  |
|  | p | .0001 |  |  |  |  |  |
| LAS-STORGE-F3 | r | .070 | .177* | 1 |  |  |  |
|  | p | .311 | .010 |  |  |  |  |
| LAS-PRAGMA-F4 | r | −.030 | .374*** | .362*** | 1 |  |  |
|  | p | .662 | .0001 | .0001 |  |  |  |
| LAS-MANIA-F5 | r | −.049 | .225** | .136* | .224** | 1 |  |
|  | p | .479 | .001 | .049 | .001 |  |  |
| LAS-AGAPE-F6 | r | .206** | .031 | .097 | .274*** | .448*** | 1 |
|  | p | .003 | .657 | .160 | .0001 | .0001 |  |
| DFRSS-DYADIC SATISFACTION | r | −.558*** | .113 | −.149* | −.043 | .055 | −.165* |
|  | p | .0001 | .102 | .031 | .538 | .428 | .016 |
| DFRSS-FAMILIAL SATISFACTION | r | −.397*** | .016 | −.074 | −.057 | −.023 | −.149* |
|  | p | .0001 | .834 | .318 | .444 | .758 | .044 |
| CAS-PD | r | −.297*** | .069 | −.076 | −.028 | .059 | −.071 |
|  | p | .0001 | .317 | .274 | .688 | .393 | .303 |
| CAS-FDC | r | .326*** | −.231** | .034 | −.113 | −.173* | .013 |
|  | p | .0001 | .001 | .623 | .103 | .012 | .850 |
| CAS-PPR | r | −.465*** | .086 | −.144* | −.038 | −.084 | −.214** |
|  | p | .0001 | .215 | .037 | .584 | .225 | .002 |
| CAS-SD | r | −.163* | .217** | −.075 | .012 | −.051 | −.076 |
|  | p | .018 | .002 | .277 | .858 | .464 | .276 |
| CAS-PASS | r | −.361*** | .126 | −.059 | −.011 | .032 | −.106 |
|  | p | .0001 | .068 | .396 | .875 | .649 | .124 |
| CAS-FEIN | r | .239*** | −.155* | .071 | .044 | −.158* | .014 |
|  | p | .0001 | .024 | .309 | .530 | .022 | .835 |
| CAS-RC | r | −.026 | −.054 | −.074 | −.047 | −.108 | −.059 |
|  | p | .703 | .436 | .283 | .498 | .119 | .392 |
| CAS-CDP | r | .434*** | −.116 | .112 | .047 | −.029 | .120 |
|  | p | .0001 | .105 | .118 | .511 | .689 | .094 |
| CAS-FAR | r | .084 | −.069 | −.055 | .007 | −.138* | −.065 |
|  | p | .226 | .318 | .426 | .923 | .045 | .351 |
| CAS-ASI | r | .081 | −.061 | −.050 | −.048 | −.262*** | −.103 |
|  | p | .241 | .379 | .475 | .489 | .0001 | .138 |
| CAS-PI | r | −.011 | −.018 | .066 | .005 | .003 | −.043 |
|  | p | .874 | .800 | .340 | .937 | .966 | .537 |
| HAPPINESS | r | −.425*** | .079 | −.134 | −.093 | .031 | −.153* |
|  | p | .0001 | .254 | .052 | .181 | .658 | .027 |
| SATISFACTION | r | −.493*** | .161* | −.124 | −.049 | .105 | −.148* |
|  | p | .0001 | .020 | .073 | .482 | .129 | .032 |

*Note.* CAS-PD: Partner disclosure; CAS-FDC: Fear of dependence and control; CAS-PPR: Perceived partner responsiveness; CAS-SD: Self-disclosure; CAS-PASS: Physical attraction and sexual satisfaction; CAS-FEIN: Fear of emotional involvement; CAS-RC: Relational communication; CAS-CDP: Closeness-distance between partners; CAS-FAR: Fear of abandonment and rejection; CAS-ASI: Anxiety and sexual inhibition; CAS-PI: Partner initiative.
* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$.

Ludus had a significant negative linear relation with CAS-FEIN and CAS-ASI (ranging from −.251 to −.255), and had a significant positive correlation with Storge, Pragma, Mania.

Storge was only positively related with Pragma; and Pragma with Mania. In relation to the LAS-SF Mania and Agape, no significant correlation level emerged.

Also for the female sample (see Table 3c), we found various correlations, mainly in the Eros dimension, but they are much weaker in the Ludus dimension compared to the male sample. In particular, Eros had a significant positive correlation with the CAS dimensions of CDP (Closeness-distance between partners), FDC (Fear of dependence and control), FEIN (Fear of emotional involvement) (ranging from .239 to .434). It had a significant and negative correlation with Ludus, DFRSS Dyadic Satisfaction, DFRSS Familial Satisfaction, with the item of general Perception of Couple Satisfaction and Happiness; and the CAS dimensions of PD (Partner disclosure), PPR (Perceived partner responsiveness), and PASS (Physical attraction and sexual satisfaction) (ranging from −.297 to −.558). Both Ludus and Storge only showed a significant positive correlation with Pragma (respectively .374 and .362). This last dimension was positively correlated with Agape (.274); and the LAS-SF Mania was positively associated with Agape (.448) and negatively correlated with the CAS dimensions of ASI (−.262). We did not observe any significant correlations for Agape.

To evaluate discriminant validity, we examined gender differences in the means for each LAS-SF factor (see Table 4). A Multivariate Analysis of Variance demonstrated a significant multivariate effect for gender (Wilk's Lambda = .894, $p$ = .0001) and significant univariate effects for Ludus [$F_{(1;405)}$ = 6.101; $p$ = .014], Storge [$F_{(1;405)}$ = 5.838; $p$ = .016] and Agape [$F_{(1;405)}$ = 17.879; $p$ = .0001]. Specifically, women had a higher score in Ludus, where a high score denoted greater disagreement with the sentences. Moreover, women also had higher scores on Storge and Agape (indicating stronger disagreement with the sentences).

## DISCUSSION

This study describes the psychometric proprieties of the Italian version of the LAS-Short form (Hendrick et al., 1998) in a sample of adults. The analyses highlighted promising psychometric results for the factor structure, as well as the original English LAS-SF. The application of CFA confirmed the original six-factor structure (Hendrick et al., 1998), demonstrating the strength of the theoretical assumptions related to the scale construction and supporting the results of studies in other contexts and cross-cultural comparisons (Kanemasa et al., 2004; Neto, 2007; Wan Shahrazad et al., 2012). The data indicate adequate internal consistency and

**Table 4** – MANOVA comparing the LAS-SF factors by gender (univariate effects)

| | Male | | Female | | Total | | F |
|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD | (df = 1;405) |
| LAS-EROS | .857 | .952 | .833 | .805 | .845 | .880 | .082 |
| LAS-LUDUS | 2.948 | 1.182 | 3.218 | 1.045 | 3.084 | 1.121 | 6.101* |
| LAS-STORGE | 2.528 | 1.278 | 2.815 | 1.140 | 2.674 | 1.217 | 5.838* |
| LAS-PRAGMA | 2.913 | 1.107 | 2.989 | .965 | 2.952 | 1.037 | .555 |
| LAS-MANIA | 2.494 | .998 | 2.389 | .982 | 2.441 | .990 | 1.158 |
| LAS-AGAPE | 1.459 | .999 | 1.892 | 1.083 | 1.678 | 1.063 | 17.879** |

*Legenda. df* = degrees of freedom.

*Note.* * $p$<.05; ** $p$<.01.

construct validity. Therefore, the LAS-SF Italian version is a reliable instrument for assessing the attitudes towards love classified by Lee (1973) in the six love styles.

However, item five ("I believe that what my partner doesn't know about me won't hurt him/her") had a low factor loading on the Ludus factor. Nevertheless, additional assessments of the factorial structure indicated that the model with 24 items was the best fit to the data.

Wan Shahrazad et al. (2012) investigated the measurement's reliability and validity in a Malaysian context and found critical issues with a few items, such as item five, that loaded more in Mania than in Ludus style in their sample.

In this study, the issue with item five could be related to the Italian translation, which may not clearly exemplify the concept that the Ludus style represents. As such, future research should define the Italian translation for this item differently; specifically, the problem might be linked to the request to agree with a sentence that contains a double negative.

Furthermore, we can assume that the specific aspect assessed by this item is linked to the heterogeneity of the participants' age.

For the relations among the six love styles, there were several associations. These findings are in contrast to those of Todosijević et al. (2009), who adapted the LAS in Serbia and only found one association between Mania and Agape. Our correlations also diverge from the assumptions of Hendrick et al. (2006) about the independence of the six love styles.

The first aspect explaining the convergences between styles that we found might be linked to the peculiarity of the sample. If these results are confirmed across various Italian samples, we can hypothesize that the current love attitude may be more fluid and less delineated in absolute categories. Each of the specific associations we found between the different love styles, as affirmed by Todosijević et al. (2009) regarding the relationship between Mania and Agape "seems to require at least a speculative explanation" (p. 72).

To examine the construct validity for the LAS-SF, we assessed convergent and discriminant validity and correlated the factor scores with dimensions from the Couple's Affectivity Scale (CAS; Raffagnino & Penzo, 2015) and the Dyadic-Familial Relationship Satisfaction Scale (DFRS; Raffagnino & Matera, 2015).

Our findings highlighted relevant associations among some different love styles and partners' affective expressions as well as perceptions of couple's satisfaction and happiness. To explain these findings, it is useful to note that LAS-SF has

reverse score questions, where a positive correlation with other variables means that when there are high scores in LAS-SF, the scores in the other variables are low, and vice-versa. As such, a negative correlation implies a positive relationship between the examined concepts.

With regard to the perceived couple satisfaction, we only found one negative correlation with the Eros dimension of the LAS. Therefore, partners who have a love attitude characterized by passion, physical and emotional attraction and commitment also express a good dyadic and familial satisfaction, thus confirming the findings of other works that have measured marital satisfaction in both women and men (Gana, Saada & Untas, 2013). In general, our data confirm the positive connotation of this love style for a high-quality marital relationship (Kanemasa et al., 2004; Vedes et al., 2016). Besides, the general Perception of Couple Satisfaction and Happiness negatively correlate not only with Eros but also with the Agape dimension of the LAS. As a result, the partners who have an altruistic and selfless style of love (Agape) also declare to be satisfied and happy with their couple relationship, in line with research on compassionate love that is often associated with this love style and is important for marital quality and stability (Berscheid, 2010).

Also with respect to the partners' affective expressions, measured by different dimensions of the CAS, we found the highest number of correlations with the Eros style. In particular, the partners who have this style experience a good intimacy dialogue with the partner (self-disclosure, partner disclosure, and perceived partner responsiveness), strong physical attraction and sexual satisfaction. These last results are consistent with the characterization of this person as an "erotic lover" (Lee, 1973), which appears also to be expressed in his/her actual relationship. In literature, the importance of sexuality and sexual satisfaction has been indicated as a key factor for couple satisfaction among people with this love style (Fricker & Moore, 2002). The importance of sexuality is also confirmed by research that found an association between romantic love, which involves feelings of attachment and the search for commitment with a partner, and sexuality, particularly sexual desire (Gonzaga, Turner, Keltner, Campos & Altemus, 2006). We also found that Eros people do not perceive a good closeness-distance between the partners (CDP) in their current couple relationship. Such data can perhaps be linked to the fact that these individuals show a fear of dependency and control (FDC) and of emotional involvement (FEIN), but they are not afraid of being abandoned and rejected (FAR).

Few affectivity dimensions also correlate with the Ludus (game playing, uncommitted love and a desire for multiple relationships) or Agape style (altruistic and selfless style of love). In particular, Ludus is negatively correlated with CAS-FDC (Fear of Dependence and Control) and CAS-FEIN (Fear of emotional involvement), and positively with CAS-SD (Self-disclosure). This suggests that individuals who express a playful and uncommitted attitude toward love, according to the characterization of this love style proposed by Lee (1973), also seem to have an uncommitted intimacy relationship with the partner. We noticed that, in contrast with research that characterizes this attitude style as typical of poor or negative marital aspects (Goodboy et al., 2012; Goodboy & Myers, 2010; Levy & Davis, 1988), in our research there is no correlation with other dimensions of couple relationship, such as satisfaction and happiness. For Agape, partners express physical attraction, sexual satisfaction (CAS-PASS) and perceived partner responsiveness (CAS-PPR). Given Agape's altruistic attitude, there is a clear association with the relational affective dimension of the spouses' perception of the other's ability to listen to, understand and support them. Indeed, the individual orientation toward love appears to be consistent with the couple's actual affective experience that is related to reciprocal responsiveness. Considering also that in our research Agape is associated with the partners' general perception of their happiness and satisfaction in the couple, a link to the empirical research can be observed, indicating that reciprocal responsiveness may improve couple happiness and satisfaction (Raffagnino, Penzo & Bertocci, 2012).

As regards the absence of any correlation, the LAS-SF did not appear to have discriminant validity with the relational dimensions of the Storge (friendship and companionship-driven love) or the Pragma (a rational love attitude) styles. A possible explanation for this finding might be related to Graham's (2011) statement that "the Pragma and Storge subscales may not be truly measuring love, rather friendship" (p. 763). Moreover, because the word "love" is polysemous (Berscheid, 2010) and can reflect affective bonds with parents, nature, friends, animals, and activities, it does not always refer to romantic love. Therefore, our results signal that these two attitudes towards love are not commensurate with these relational dimensions because they demonstrate the partners' experience about their affectivity and perceptions of couple satisfaction in the actual relationship. This does not refute the fact that the Storge and Pragma styles might also be associated with other dimensions of marital quality.

These findings suggest that there is a need to distinguish between positive and negative love styles and their association with relationship quality. Our data demonstrate that the facets of the relational dimensions (in our case, couple affectivity and satisfaction) are positively and negatively related to love styles based on the relationship dimension. Additionally, in some cases, lack of or a weak relationship between the variables suggests that couple relationships may be independent from conceptualizations of the ways of loving.

For *gender*, there were no differences in the Eros, Pragma and Mania styles, although there were differences in the Agape, Ludus and Storge styles. These results confirm the studies that do not indicate any gender differences in love style attitudes (Wan Shahrazad et al., 2012), as well as those that affirm the existence of gender divergences (Ferrer-Pérez, Bosch-Fiol, Navarro-Guzmán, Ramis-Palmer & Garcia-Buades, 2009). As regards the love style, women were more likely to adopt a Ludus, Storge or Agape style. These data are not consistent with several studies that found a prevalence of Agape and Ludus for men and not for women (Ferrer-Pérez et al., 2009; Neto, 2007; Regan, 2016). In addition, for the Agape style, research on compassionate love did not find any gender differences (Rauer, Sabey & Jensen, 2014). Our results are not consistent with research that found that men are more likely to use the Eros style (Ferrer-Pérez et al., 2009). The correlation analysis among the different variables for the two - male and female - samples provides further information about gender differences. A first observation concerns the correlations among the six love styles, more frequent in the male than in the female sample. As hypothesized for the total sample, if future research confirms these results, we will be able to affirm that men have a more fluid and less delineated love attitude than women, especially for the Eros style.

Our findings revealed that among the love styles, Eros contributed to dyadic and familial satisfaction for both men and women as also revealed by other studies (Gana et al. 2013; Vedes et al. 2016).

A further observation regards the correlation between LAS and CAS. For both males and females we found the highest number of correlations with the Eros style; and for men also a lower association with the Ludus style. These findings are supported in literature by Goodboy and Booth-Butterfield (2009) that had similar results concerning the association between Eros and the closeness of couple partners in research with a general sample.

In relation to the specific dimensions of the affectivity construct, we observed few gender differences in correlations with the Eros style. Male partners with a love attitude characterized by passion, physical and emotional attraction and commitment, did not express fear of abandonment and rejection, anxiety or sexual inhibition; the female partners with this love style tended to perceive partner disclosure. These results appear in line with the study highlighting the importance of sexuality and sexual satisfaction for males with the Eros style (Raffagnino et al., 2012; Raffagnino & Penzo, 2015). Similarly, the fact that compared to males, females with the Eros style expressed a deeper appreciation of their partner's openness and feelings (one of the three dimensions of intimate dialogue) seems to be in line with the studies affirming that intimacy is experienced differently by men and women (the latter being more susceptible to intimacy) (De Andrade, Wachelke & Howat-Rodrigues, 2015; Raffagnino et al., 2012).

Besides, men with Eros style are not afraid of being abandoned by their partners, a feeling which is present in the men with a Ludus attitude toward love. Therefore, the tendency of males to tolerate this fear should be able to find a distinction on the basis of love styles.

As regards the Ludus style, we found very few correlations with affectivity, and only in the male sample. In fact, in our sample Ludus is related to FEIN and ASI dimensions, as we observed in the Eros style, but in an opposite manner to men with a game playing, uncommitted love and a desire for multiple relationships who tend to express worry about sexual performance, the difficulty of speaking about sexuality (CAS-ASI) and fear of emotional involvement (CAS-FEin). As stated about the general sample, this correlation might express an uncommitted emotional and sexual intimacy in the male sample and not in the female sample.

Our research has several limitations; among these, there is the problem related to the geographical area involved in the research. We used a convenience sample consisting of predominantly white, Tuscany, middle-class individuals with high education levels. It would be desirable, in a subsequent phase of the work, to validate the LAS-SF in a larger and more heterogeneous sample. Another limitation is related to the variables that were examined in the convergent analysis. We focused on two dimensions: affectivity and relational satisfaction. It would be useful to examine additional relational dimensions that assess primary risk and protective factors for marital quality and stability. For example, it

might be relevant to include the adult attachment bond and relational aspects (e.g., the partner's commitment, couple communion and leisure, emotional and cognitive jealousy) which could be associated with the different characteristics of each love style. These aspects might differentiate between good and bad love styles for relational quality and provide a more comprehensive picture of how love attitudes can affect the couple's experience. In particular it would be interesting to evaluate the convergent validity of the LAS with respect to the two dimensions of Anxiety and Avoidance in adult attachment, measured through one of the most widely used tools – the ECR-R questionnaire - for which an Italian validation exists (Busonera, San Martini, Zavattini & Santona, 2014). Furthermore, our study did not examine changes in the association between love styles and relationship experiences over time. Several researchers have noted the importance of the relationship stage for marital quality and stability (McNulty, Wenner & Fisher, 2016) as well as the role of age in the acceptance and preference of love styles (Ferrer-Pérez et al., 2009; Hendrick & Hendrick, 1986; Rauer et al., 2014). Asking questions about love attitudes and marital experiences among partners of different ages and relationship stages may be essential for understanding the love styles as risk and protective factors of marital stability and quality, as well as points of strength for the associations among different relational and personal variables.

Another limitation is related to the controversial aspect of the calculation of multiple correlations between the set of variables; in order to overcome the problems related to the multiplicity adjustment of the *p*-value, in future phases of the research it might be useful to consider the application of bootstrap methods for *p*-value adjustment, in order to look more closely at these issues.

For the data analysis, we accounted for individual scores in a sample of married, cohabiting couples or boy/girlfriends. Given that the love attitude is expressed in a couple relationship, future research should analyze the couple dyads for love style. While this method is rarely used in love research (to our knowledge, only two studies have used a dyadic approach; i.e., Gana et al., 2013; Rauer et al., 2014), it is widely used to analyze couple coping and adult attachment (Bodenmann & Randall, 2012). As Rauer et al. (2014) stated with regard to compassionate love, "by including both spouses, we were able to find complex associations not only between the provision and receipt of compassionate love and health but also the extent to which these links differed

based on who was reporting on the compassionate love and whose health was in question" (p. 690). This type of analysis could help overcome the limitations related to studying love in student samples that do not identify the romantic relationships in which participants should refer to when completing a love questionnaire (Berscheid, 2010).

As far as the gender differences are concerned, we found some different correlations between the various variables; in order to broaden this relevant topic it might be useful, in the following phases of the work, to apply two different confirmatory factor analyses in relation to the gender.

The current version of LAS-SF in the Italian context definitely has good psychometric proprieties with 23 items; nevertheless, in a following phase of the work, it would be desirable to define a new translation for the item five. This fact could help us to understand whether a new phrasing would more adequately communicate the real meaning of the original item five devised by the authors (Hendrick et al., 1998).

In short, love is an essential component of marital quality and stability. Therefore, understanding the partners' love attitudes could help clinicians identify functional and dysfunctional aspects of the couple's relationship. Clinically, partners' different love attitudes (for example, husbands with ludic and wives with commitment attitudes) proved to be a source of couple conflict. Integrating love attitudes and couple affectivity in a theoretical model and in relational clinical interventions might be useful for helping couples face and overcome crises in their intimacy, trust, and partners' emotional distance.

## CONCLUSIONS

Our preliminary study examined the validity of the Italian LAS-SF and confirmed the presence of the six hypothesized love styles; it also highlighted a good convergent validity between love styles and several dimensions of the multidimensional construct of couple affectivity. Moreover, the results indicate that there are gender differences in some love styles thus stressing the importance of examining both similarities and differences between men and women in couple relationships.

In general, this evidence supports the utility of the LAS-SF for both clinical and research purposes. Indeed, this tool might allow for in-depth understanding of the risk and protective factors in couple relationships as they relate to love attitudes which are crucial for marital quality and stability (Sprecher & Hatfield, 2017). In a clinical context, the LAS-SF can be used by psychologists to identify the spouse's love style and gather information about its association with psychological correlates in order to enable more focused and effective counseling.

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# Social network sites addiction, internet addiction and individual differences: The role of Big-Five personality traits, behavioral inhibition/activation systems and loneliness

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⚯ ABSTRACT. Il presente studio approfondisce, nel contesto italiano, la relazione tra i tratti di personalità Big Five, i sistemi di inibizione (BIS) e attivazione comportamentale (BAS) in associazione con la dipendenza dai Social Network Sites (SNSs). Inoltre, è stato analizzato il ruolo della dipendenza dai SNSs come mediatore dell'associazione tra la solitudine percepita e la dipendenza da internet. Il campione di studio era composto da 580 utilizzatori di SNSs che hanno compilato un questionario self-report on-line. Il risultato della analisi di regressione ha evidenziato che la coscienziosità era negativamente associato con la dipendenza dai SNSs, mentre il BIS e una dimensione del BAS (*fun seeking*) erano positivamente associate alla dipendenza dai SNSs. L'analisi di mediazione ha mostrato che la solitudine era indirettamente associata alla dipendenza da internet attraverso la dipendenza dai SNSs. Le persone altamente coscienziose, organizzate e proattive, tendono ad evitare l'abuso dei SNSs che possono interferire con i loro obiettivi di vita.

⚯ SUMMARY. *The present study focuses on a new specific form of addiction related to social network sites (SNSs). SNSs addicted people spent a considerable part of their day-life to SNSs, with a serious impact on their health. The present study deepens the association between Big-Five personality traits and behavioral inhibitions and activation systems with SNSs addiction. Furthermore, it was studied the role of SNSs addiction in mediating the association between perceived loneliness and internet addiction. The study sample consisted of 580 Italian SNSs users who filled an on-line self-report questionnaire. Regression analysis revealed that conscientiousness was negatively associated with SNSs addiction, while the behavioral inhibition system and the sensitivity to fun-seeking rewards were positively associated with SNSs addiction. Mediational analysis revealed that loneliness was indirectly associated with internet addiction via SNSs addiction. High consciousness people are organized and proactive tending to avoid the abuse of SNSs that could interfere with their goals.*

**Keywords:** *Social network, Addiction, Individual differences*

## INTRODUCTION

The internet has broadened the opportunities for people to connect and interact (Ellison, Vitak, Gray & Lampe, 2014). The use of social network sites (SNSs; e.g., Facebook, Twitter, Instagram) has increased in the last ten years. Over one billion people in the world use SNSs daily (Guedes, Nardi, Guimarães, Machado & King, 2016). SNSs have become a central concern in the field of communication and media research, and are regarded as a sort of "proxy variable" for fostering social interactions (Zhang & Leung, 2015). According to Grieve, Indian, Witteveen, Tolan & Marrington (2013), through the massive use of SNSs, people develop and maintain relationships and social connectedness in online environments, experiencing positive psychological outcomes such as a greater satisfaction with life. Sosik & Bazarova (2014) found that use of SNSs is a predictor of relational escalation through different types of mediated communication opportunities such as private messages, photo tags, wall posts and comments.

Besides this common use of SNSs, recent literature has increasingly focused on the pathological form of SNSs use, i.e. SNSs addiction (Andreassen, 2015; Guedes et al., 2016). While SNSs addiction was considered as a part of the internet addiction disorder, recent studies (Kuss & Billieux, 2016; Wegmann, Snagowski & Brand, 2016) posited that internet addiction can be distinguished by SNSs addiction because SNSs addiction can be viewed as a sort of specific form of addiction inside the umbrella of the several on-line mediated activities. SNSs addiction, as well as internet addiction, have not been considered specific nosological disorders (Pies, 2009), but an increasing number of studies start to assess the specificity of these phenomena (Andreassen et al., 2016; Starcevic & Billieux, 2017).

A key distinction between over-engagement in social networking and SNSs addiction is needed. According to Griffith (2010), "overtly engaged" SNSs users can stay controlled, appreciating other activities and leading multidimensional lives, while SNSs addicts use social networks in uncontrolled and compulsive ways, which are more likely to have unfavorable consequences. Andreassen & Pallesen (2014, p. 4054) define SNSs addiction as "being overly concerned about SNSs, to be driven by a strong motivation to log on to or use SNSs, and to devote so much time and effort to SNSs that it impairs other social activities, studies/job, interpersonal relationships, and/or psychological health and well-being".

In order to measure SNSs addiction, Andreassen et al. (2016) developed the Bergen Social Media Addiction Scale (*BSMAS*). The original scale is composed of six items which mirror the six dimensions of SNSs addiction (Andreassen, Torsheim, Brunborg & Pallesen, 2012): a) *salience*, SNSs activity dominates thinking and behavior; b) *mood modification*, the use of SNSs impacts on and alters mood; c) *tolerance*, the need to spend more time on SNSs in order to guarantee the same pleasant sensation experienced before; d) *withdrawal*, symptoms of abstinence or negative feelings (e.g., irritation, anxiety, depression, sleep deprivation) when access to SNSs is not possible; e) *conflict*, the use of SNSs interferes with social, family, work or other domains; f) *relapse*, unsuccessful attempts to stop or control behavior (Andreassen et al., 2016; Kuss, Griffiths, Karila & Billieux, 2014).

A series of epidemiological reports have highlighted that SNSs addiction has prevalence rates that vary from 1.6% to 34% depending on the socio-cultural contexts (Andreassen, 2015). Concerning socio-demographic characteristics, some studies have highlighted that females are more addicted to SNSs than males (Andreassen, 2015; Andreassen et al., 2016), whereas others have shown that younger *vs* older people are more addicted (Andreassen et al., 2012; 2016). Conversely other studies have not found any differences among age groups (Koc & Gulyagci, 2013; Wu, Cheung, Ku & Hung, 2013). Andreassen et al. (2016) showed that educational status was negatively associated with SNSs addiction, though other studies (Kuss & Griffiths, 2012) have not confirmed this result, thus highlighting the need to explore these findings further (Andreassen et al., 2016).

A recent study found that problematic Facebook users can be clustered in different paths of social engagement. These authors find that some users, higher in social engagement, tend to use Facebook for maintaining existing relationship, while others had a low social engagement but tend to use Facebook for sharing contents and for gaming purpose (Ryan, Reece, Chester & Xenos, 2016). Nevertheless, for SNSs addicted nothing inhibits their unceasing use of social networks, even though this behavior leads to a generalized lower quality of life and specific relational problems (Andreassen, 2015). In this vein, the consequences of SNSs addiction include health, behavioral and emotional impairments. Overall SNSs addiction affects people's well-being (Andreassen, 2015). Some studies have highlighted that SNSs addiction is related to depression and anxiety (Hong, Huang, Lin, Chiu, 2014; Koc & Gulyagci, 2013). SNSs addicted

people use social networking to cope with negative feelings, also they experience high levels of anxiety when detaching themselves from social networks. Social consequences include impairment, neglect and isolation from different social environments (family, work or school domains) due to an exceeding devotion to social networking (Griffiths, Kuss & Demetrovics, 2014; Koc & Gulyagci, 2013).

A series of studies highlighted that SNSs addiction and internet addiction are related phenomena (Starcevic & Billieux, 2017; see also Müller, Beutel & Wolfling, 2014; Müller et al., 2016). According to Young, internet addiction is defined as any online-related compulsive behavior which critically interferes with normal life, creating severe stress in personal life and in close relationships (Young, 1996, 1998). SNSs addiction could be a specific and distinguished component of a broader internet addiction, and these two types of addiction can have different antecedents (Kuss & Billieux, 2016; Wegmann, Snagowski & Brand, 2016).

A series of studies examined individual differences associated with the development of internet addiction but relatively few studies have extended these findings on SNSs addiction. Scholars found that internet addiction was associated with Big-Five personality traits, that is positively linked to Neuroticism, Extraversion, Agreeableness, Openness to experience and negatively linked to Consciousness (Dong, Wang, Yang & Zhou, 2013; Kuss, Van Rooij, Shorter, Griffiths & van de Mheen, 2013). Yen, Ko, Yen, Chen & Chen (2009) found that people addicted to internet were sensitive to condition punishment and reward. Internet addiction was also positively associated with perceived loneliness (Kim, La Rose & Peng, 2009). Studies highlighted that SNSs use was positively associated with Neuroticism, Extraversion and negatively with Consciousness (Andreassen et al., 2012, 2013; Hong et al., 2014; Wilson, Fornasier & White, 2010) and also positively associated with loneliness (Bozoglan, Demirer & Sahin, 2013). Contrary than internet addiction, Andreassen et al., (2012) did not found association between sensitivity to condition punishment and SNSs addiction, while they found a negative unexpected association between sensitivity to condition reward and SNSs' addiction. These results are sometimes contradictory (Andreassen et al., 2012) and need to be deepened in various contexts and within different target populations.

Deepening the research on antecedents and consequences of SNSs addiction considering the specificity of the socio-cultural contexts and socio-demographic characteristics represent a challenge for the scholars in order to systematically assess and prevent the phenomenon. In this vein, few systematic studies have been done for assessing the phenomenon of SNSs addiction, especially in the Italian context (Monacis, De Palo, Griffiths & Sinatra, 2017a, 2017b).

In order to address this gap, the present study aimed at examining individual differences as possible antecedents of SNSs addiction controlling for the effect of the main socio-demographic characteristics (age, sex, educational status).

The present study examined the role of Big-Five personality traits (McCrae & Costa, 1999), and the behavioral inhibition/behavioral activation system (Carver & White, 1994), in association with the problematic use of SNSs.

Moreover, it further deepened the association between perceived loneliness and addiction to SNSs and to internet (Bozoglan et al., 2013; Ostovar et al., 2016; Yao & Zhong, 2014). It was hypothesized that SNSs addiction mediates the relationship between loneliness and internet addiction as a way for fulfilling people's need of social interactions (Zhang & Leung, 2015). In this vein, the present study contributes to the recent scientific debates on the nature of internet addiction as a generalized "umbrella construct" (Kuss & Billieux, 2016) which encloses several activities mediated by web, e.g., SNSs use (Griffiths, Kuss, Billieux & Pontes, 2016; Kuss et al., 2014; Montag et al., 2015; Müller et al., 2016; Wegmann et al., 2016) instead of being a specific form of addiction as some studies posited (Aboudjaoude, Koran, Gamel, Large & Serpe, 2006; Byun et al., 2009).

## SNSs addiction, Big-Five personality traits and behavioral inhibition and activations systems

Studies (Andreassen et al., 2012; 2013; Hong et al., 2014) have analyzed the association between SNSs addiction and the personality traits of the Big-Five personality model: Neuroticism, Extraversion, Openness to experience, Agreeableness, and Conscientiousness. In particular, Neuroticism and Extraversion were positively associated with SNSs addiction, while Conscientiousness was negatively associated with SNSs addiction. Highly neurotic people tend to be shy, anxious or depressed and tend to use social networks to obtain social support. Extraverted people, on the other hand, use social networks as a way to express

themselves. For example, Krämer & Winter (2008) found that extraversion was correlated to a less constrained on-line self-presentation. High extroverted people showed less conservative pictures of themselves. Finally, people with a high score in conscientiousness tend to avoid the use of SNSs in order to reach more easily their primary objectives and tasks (Andreassen et al., 2012, 2013; Wilson et al., 2010).

According to Kuss & Griffiths (2012) the brain's reward system is involved in SNSs addiction. The use of SNSs is easily fostered by positive reinforcement and the avoidance of negative consequences (Guedes et al., 2016). Yen et al. (2009) found that addiction to internet was positively associated with a specific behavioral reward mechanism (Carver & White, 1994). The Behavioral Inhibition System (BIS), also called "anxiety sensitivity", describes the sensitivity to avoiding punishing and unpleasant stimuli, and the Behavioral Activation System (BAS) describes the sensitivity to rewarding stimuli. Yen et al. (2009) showed that college students with problematic internet use had higher score on the BIS and on a specific subscale of BAS system named Behavioral-Approach Fun-Seeking (BAS-FS). The association between BIS and SNSs addiction could be explained because face-to-face social interactions are more punitive in terms of social reputation, while on-line interactions are perceived as less dangerous (anonymity, lack of direct interaction) and people can easily escape, logging out, from SNSs. People with high sensitivity to condition punishment (BIS) could be more addicted to SNSs sites as a less anxious and thus punitive way to fulfill their need of social contacts compared to face-to-face interaction. Moreover, some kinds of SNSs rewards such as "likes" evaluations, comments, feedback and re-posting are pleasurable and seductive and satisfy the basic needs of love, belonging, self-esteem and self-actualization in the virtual world (Yen et al., 2009). For this reason, the BAS-FS could be associated also with SNSs addiction. To the best of author's knowledge, was found only one study that examined the association between SNSs addiction and the BIS/BAS model (Andreassen et al., 2012). Andreassen et al. (2012) found that the BIS was negatively correlated to Facebook addiction and BAS-FS was negatively related to Facebook addiction. These authors claimed that participants who score highly in BAS-FS, could be viewed as people who regard Facebook as "old news" and thus lacking in fun and novelty. However, as the authors claimed, these results are preliminary and need to be further tested (Andreassen et al., 2012).

*Hypothesis 1*: In the present study, it was hypothesized that SNSs addiction would be positively associated with Neuroticism and Extraversion, and negatively associated with Conscientiousness. It was also hypothesized that SNSs addiction would be positively associated with the sensitivity to condition punishment (BIS) and with the behavioral-approach fun-seeking (BAS-FS).

## The link between loneliness, SNSs addiction and internet addiction

Loneliness is a result of the perceived absence of social interactions and social network (Russell, Peplau, & Cutrona, 1980). Kim et al. (2009) pointed out that a greater perception of loneliness is associated with internet addiction in college students. Other studies confirmed that internet and SNSs addiction were associated with a higher perception of loneliness (Bozoglan et al., 2013; Ostovar et al., 2016; Yao & Zhong, 2014). Those who lack social contacts and feel lonely are more exposed to a problematical use of internet because they perceive themselves unskilled in face-to-face social interactions. For this reason, lonely people can feel more comfortable and skilled in the on-line interactions that are considered less threatening because of anonymity and the lack of face-to-face interactions (Caplan, 2003). Internet, and especially the use of SNSs (e.g., post Facebook status; Deters & Mehl, 2013), can contribute in reducing the perception of loneliness fulfilling people's need of social interactions.

Scholars are debating regarding the association between SNSs addiction and internet addiction (Wegmann et al., 2016). Indeed, according to Young (1996, 1998) internet addiction is defined as *any* online-related compulsive behavior which seriously interferes with everyday life, creating severe stress for family, friends, close relationships, and impacting on the work environment (see also, Kraut et al., 1998; Kuss et al., 2014; Treuer, Fabian & Furedi, 2001). Young (2009) posits that there was an association between internet addiction and different aspects of on-line use such as compulsive gaming, sex dating, and e-mailing/texting or others forms of communication mediated by the web such as SNSs.

In this vein, studies confirmed that social networking was associated with internet addiction (Starcevic & Billieux, 2017; see also Müller et al., 2014, 2016) because SNSs can be used systematically and problematically for specific multiple on-line activities (Griffiths et al., 2016; Kuss et al., 2014;

Müller et al., 2016; Wegmann et al., 2016). Montag et al., (2015) argued that SNSs addiction could be conceptualized as a sort of small world within the large world wide web, in which people can perform generalized internet activities (e.g., messaging, chatting, gaming, surfing on web). Internet addiction can be viewed as a sort of "umbrella construct" which includes a series of differentiated on-line activities (Kuss & Billieux, 2016) that can be reached and performed also using SNSs.

However, few studies have been conducted on the relationship between SNSs addiction and internet addiction (Monacis et al., 2017b; Müller et al., 2016) and further investigation is needed. In the present paper, it was studied a model where the feeling of loneliness is directly associated with SNSs addiction for fulfilling people's need of social contacts. In turn, SNSs addiction was expected to be associated with a more likelihood to show a generalized internet addiction developed through the massive use of available specific on-line activities (e.g., messaging, surfing on web, streaming content) than can be accessed via SNSs.

*Hypothesis 2*: It was hypothesized an indirect effect between loneliness and internet addiction mediated by SNSs specific addiction.

## METHOD

## Participants and procedure

A convenience sample was recruited. Data were collected through a web-based on-line survey, and participants were approached via social networks (e.g., Facebook, Twitter and Instragram). The link to the questionnaire was disseminated in SNSs through specific pages, links, posts and discussion groups. There were two main reasons for this: a) the need to reach a large sample of people who used social networks; b) completing the questionnaire was easy for the respondents, they only had to click on a link and follow the instructions.

Five-hundred and eighty participants completed the on-line survey, of which 362 were female, (62.40%). All the participants used SNSs and were Italian. The mean age was 32 (*SD* = 12.41). Educational attainment was distributed as follows: completed primary school (n = 33, 5.70%), completed high school (n = 306, 52.80%), university degree (n = 109, 18.80%), second degree (n = 94, 16.20%), and post-graduate

(n = 38, 6.60%). Participants were distributed throughout Italy. In particular, 56 (9.70%) came from the north, 457 (78.80%) came from the central region and 67 (11.60%) came from the south. Finally, 11 (1.90%) participants claimed that they had used SNSs for less than 1 year, 36 (6.20%) from 1 to 3 years, 180 (31.00%) from 3 to 6 years, 314 (54.10%) from 6 to 10 years, and 39 (6.70%) over 11 years.

## Measures

– *SNSs addiction*. This was measured using the Italian adaptation (Monacis et al., 2017a) of the BSMAS scale (Andreassen at al., 2016). The scale is composed of 6 items with a 6-point Likert response scale (from 1 = very rarely to 5 = very often; e.g., "How often during the last year have you spent a lot of time thinking about social media or planned use of social media?"). Cronbach's alpha score was α = .70.

– *Internet addiction*. This was measured using the Addiction subscale included in the *Use, Abuse and Dependence on the Internet* (*UADI*) inventory (Del Miglio, Gamba & Cantelmi, 2001). The scale was composed of 15 items with a 5-point Likert response scale (from 1 = absolutely false to 5 = absolutely true; e.g., "It is difficult for me to disconnect from the internet"). Cronbach's alpha score was α = .80.

– *Loneliness*. This was assessed using a revised Italian adaptation (Cavallero, Ferrari & Bertocci, 2006) of the R-UCLA Loneliness Scale (Russel et al., 1980). The scale was composed of 20 items with a 4-point Likert response scale (from 1 = never to 4 = often; e.g., "I am no longer close to anyone"). Cronbach's alpha was α =. 82.

- *Big-Five personality traits*. These traits (Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness) were assessed using the Italian adaptation (Guido, Peluso, Capestro & Miglietta, 2015) of the abbreviated form of the *Big-Five Inventory* (Rammstedt & John, 2007). The scale was composed of 10 items with a 5-point Likert response scale (from 1 = disagree strongly to 5 = agree strongly; e.g., agreeableness, "I see myself as someone who… is outgoing, sociable"). In the original study (Rammstedt & John, 2007) and in the Italian adaptation (Guido et al., 2015), the scale presented good psychometric proprieties and the questionnaire was indicated as a reliable and valid measure for assessing personality.

– *Behavioral inhibition / Behavioral activation-fun seeking*. The sensitivity to conditioned punishment (BIS mechanism; 7 item with a 5-point Likert scale; e.g., "If I think something unpleasant is going to happen I usually get pretty worked up"; in this study, $\alpha$ = .81) and the behavioral approach to new rewarding situations (Fun Seeking, BAS-FS; 4 item with a 4-point Likert scale; e.g., "I will often do things for no other reason than that they might be fun"; in this study, $\alpha$ = .78) were measured using the specific scales of the Italian adaptation (Leone, Pierro & Mannetti, 2002) of the original BIS/BAS scale (Carver & White, 1994).

## Data analyses

To evaluate the factorial structure of the BSMAS was carried out a confirmatory factor analysis using IBM SPSS Amos v.21. The goodness of fit of the models was checked using relative chi-squared index ($\chi^2/df$), the Tucker-Lewis index (TLI), the Comparative Fit Index (CFI), the Root Square Mean Error of Approximations (RMSEA), and the Standardized Root Mean Square Residual (SRMR). A good model fit is indicated by relative chi-square index between 0 and 3 (Kline, 1998), TLI and CFI values greater than .90 and .95 reflect an acceptable and excellent fit to the data respectively, and values smaller than .08 or .06 for RMSEA and SRMR reflect an acceptable and good model fit, respectively (Hancock & Mueller, 2013; Hu & Bentler, 1999).

SPSS v.22 was used for statistical analyses. Descriptive statistics (mean, standard deviation and Pearson's *r* correlations) were carried out for preliminarily examining study's variables. An independent sample *t*-test was performed in order to evaluate differences in SNSs addiction considering sex (male, female), age (above or below median age in years) and educational level (people with a high school diploma or below vs graduates or above).

Multiple regression analysis was performed to test the associations between Big-Five personality traits and BIS/BAS system with SNSs addiction (was also included sex, age and educational level as controlling variables). Finally, PROCESS' SPSS Macro (Hayes, 2012) was used for testing the mediation of SNSs addiction between loneliness (predictor) and internet addiction (outcome) through a series of multiple regression analyses (including sex, age and educational level as controlling variables). According

to MacKinnon (2008) for checking a mediation effect one's need at least to find, a) "path a": a direct path between predictor (loneliness) and mediator (SNSs addiction) and, b) "path b" a significant relationship between mediator (SNSs addiction) and outcome (internet addiction) in the presence of the predictor (loneliness). A significant direct effect between predictor (loneliness) and outcome (internet addiction) is not required ("path c"). The bootstrap method was used to test the significance of the indirect effect of internet addiction on loneliness via SNSs addiction, generating a 95% bootstrap percentile confidence interval of the indirect effect based on 1,000 bootstrap samples (Preacher & Hayes, 2004).

## RESULTS

## Preliminary analyses

A CFA was run in order to verify the original structure of the BSMAS scale (Andreassen et al., 2016). This one factor model (M1) did not fit the data very well ($\chi^2$ = 133.15, *p*<.001, *df* = 9; $\chi^2/df$ = 14.80; TLI = .64; CFI = .79; RMSEA = .15; RMSR = .08). However, after a recognition of the modification indices in M1, M2 was created by adding correlations between the residual terms of items 1 and 2, and between items 3 and 6. The correlations between these residual terms were easy to explain because they were added among observed variables (item) of the same latent dimension (Andreassen et al., 2012, 2016). M2 ($\chi^2$ = 13.73, *p*>.05, *df* = 7; $\chi^2/df$ = 1.96; TLI = .98; CFI = .99; RMSEA = .04; RMSR = .03) showed a significantly improved fit compared to M1 (M1 − M2: $\Delta\chi^2$ = 119.42, $\Delta df$ = 2, *p*<.001). Factor loadings of the model were satisfactory ranging from .45 to .67 further evidencing the goodness of the Italian adaptation of the BSMAS (see also, Monacis et al., 2017a).

Table 1 reports the means, standard deviations and correlations among variables. The independent sample *t*-test showed a difference in BSMAS score for sex, *t*(578) = −2.50, *p*<.05 (men: M = 2.10, *SD* = .66; women: M = 2.24, *SD* = .70) and educational level, *t*(578) = 2.89, *p*<.01 (up to high school diploma: M = 2.26, *SD* = .70; with a degree or above: M = 2.10, *SD* = .66); no differences were found for age, *t*(578) = 1.35, *p*>.05 (young: M = 2.22, *SD* = .71; adults: M = 2.15, *SD* = .67).

**Table 1 –** Means, standard deviations and correlations among variables (N = 580)

| Variable | Mean (SD) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. SNSs addiction | 2.19 (.69) | | | | | | | | | |
| 2. Extraversion | 3.18 (.97) | −.03 | | | | | | | | |
| 3. Agreableness | 3.84 (.66) | −.11** | −.09* | | | | | | | |
| 4. Conscientiousness | 3.48 (.80) | −.14** | .16** | .19** | | | | | | |
| 5. Neuroticism | 3.20 (.95) | .15** | −.06* | −.22** | −.18** | | | | | |
| 6. Openess | 3.66 (.92) | −.01 | .04 | .11** | .10* | −.04 | | | | |
| 7. BIS | 3.43 (.78) | .20** | −.22** | −.11** | −.11** | .49** | .03 | | | |
| 8. BAS−FS | 2.95 (.93) | .11** | .25** | −.25** | −.09* | .15** | .07 | .02 | | |
| 9. Loneliness | 1.83 (.40) | .19** | −.44** | −.13** | −.09* | .12** | −.08* | .22** | −13** | |
| 10. Internet addiction | 2.73 (.64) | .54** | −.02 | −.21** | −13** | .17** | −.04 | .28** | .29** | .19** |

*Note.* *p<.05;**p<.01.

## H1: Individual differences and SNSs addiction

Regression analysis is reported in Table 2. The BSMAS total score was positively associated with sex (β = .11, *p*<.05) and negatively associated with educational level (β = −.09, *p*<.05). The hypotheses were partially confirmed. Of the Big-Five personality dimensions, Conscientiousness was negatively associated with BSMAS (β = −.10, *p*<.05), whereas Neuroticism (β = .02, *p*>.05) and Extraversion (β = −.02, *p*>.05) were not associated with the BSMAS dimension. Finally, as expected, the BIS (β = .14, *p*<.01) and BAS-FS (β = .09, *p*<.05) mechanisms were positively associated with the BSMAS total score.

## H2: Relationship between Loneliness, SNSs addiction and Internet addiction

Table 3 shows the results of regression analyses for testing the mediation hypothesis. All analyses were performed controlling for age, gender and educational level. The association between Loneliness and SNSs addiction (path a, B = .32, *p*<.001) was significant as well as the association between SNSs addiction and Internet addiction in the presence of Loneliness (path b, B = .50, *p*<.001). Thus, the requirements for configuring a mediation model were met. The direct effect of Loneliness on Internet addiction was significant (path c, B = .13, *p*<.05) in the presence of SNSs addiction. The bootstrap method highlighted that the indirect effect of Loneliness on Internet addictions was significantly mediated by SNSs addiction within a 95% CI (B = .16; CI: .02, .24). Results of mediation analysis are summarized in Figure 1.

## DISCUSSION

The aim of the present study was to deepen individual differences as possible antecedents of SNSs addiction phenomenon in the Italian context, further studying the association between SNSs addiction and internet addiction.

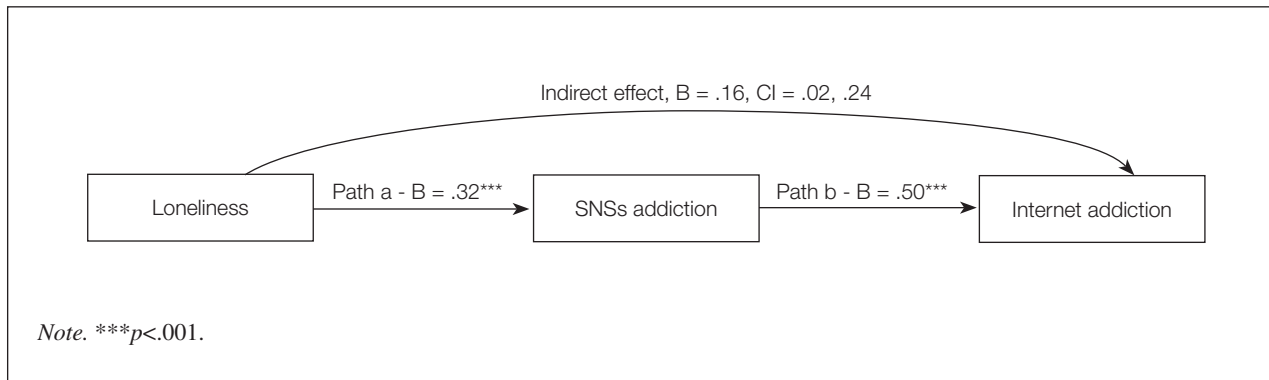**Table 2** – Regression analyses of BSMAS total score on several predictor variables

| Predictors | β | t | 95% CI |
|---|---|---|---|
| Sex | .11* | 2.51 | .03; .28 |
| Age | −.03 | −.59 | −.01; .01 |
| Educational level | −.09* | −2.16 | −.12; −.01 |
| Extraversion | −.02 | −.36 | −.07; .05 |
| Agreeableness | −.05 | −1.20 | −.15; .04 |
| Conscientiousness | −.10* | −2.28 | −.16; −.01 |
| Neuroticism | .02 | .36 | −.06; .08 |
| Openness | .01 | .30 | −.05; .07 |
| BIS | .14** | 2.89 | .04; .21 |
| BAS-FS | .09* | 2.03 | .02; .14 |

*Note. *$p<.05$; **$p<.01$.*

**Table 3** – Multiple regression analyses for testing the mediation hypothesis

| Predictor | Outcome | | | |
|---|---|---|---|---|
| | SNS addiction | | Internet addiction | |
| | B | 95% CI | B | 95% CI |
| SNSs addiction | - | - | .50***[b] | .43, .56 |
| Loneliness | .32***[a] | .18, .45 | .13*[c] | .02, .24 |
| Sex | .16** | .04, .27 | −.17*** | −.26, −.08 |
| Age | −.01* | −.01, −.01 | .00 | −.01, .01 |
| Educational level | −.06* | −.11, −.01 | −.03 | −.07, .01 |

*Note. *$p<.05$; ** $p<.01$; *** $p<.001$; [a] = path a, [b] = path b, [c] = path c.*

**Figure 1** – Results of mediation analysis



Indirect effect, B = .16, CI = .02, .24

| Loneliness | Path a - B = .32*** → | SNSs addiction | Path b - B = .50*** → | Internet addiction |

*Note.* ****p*<.001.

In particular, it was studied the association between Big-Five personality traits and BIS/BAS with SNSs addiction. Also, it was verified the mediational role of SNSs addiction in the relationship between Loneliness and Internet addiction.

The preliminary analyses revealed that the Italian adaptation of the BSMAS scale had a unidimensional factorial structure, which was coherent with the original model (Andreassen et al., 2012, 2016) and with the Italian validation (Monacis et al., 2017a). The scale is a valid and reliable measure of SNSs addiction by assessing information regarding the salience, mood modification, tolerance, withdrawal, conflict and relapse phenomena related to the exaggerated use of SNSs (Andreassen et al., 2016; Kuss et al., 2014) in the Italian context.

Concerning the socio-demographic differences, independent sample *t*-test analyses showed that women (*vs* men) and undergraduates (*vs* graduates) had a higher score in relation to SNSs addiction measured with the BSMAS, whereas no differences were found regarding age. These results are in line with previous studies (Andreassen, 2015; Andreassen et al., 2012) which highlighted a greater sensitivity of females to SNSs addiction due to their predisposition for social interaction. A greater educational status was also negatively associated with SNSs addiction as evidenced by some studies (Andreassen et al., 2016). However other studies have reported different findings (Kuss & Griffiths, 2012) highlighting a greater sensitivity of graduate students (*vs* undergraduates) to internet and SNSs addiction. On the basis of these results, Andreassen (2015) claimed that further investigations are necessary.

The results of multiple regression analyses (Table 2) partially confirmed the Hypothesis 1. As expected, the Conscientiousness trait of the Big-Five model of personality was negatively associated with SNSs addiction. People with a high level of Conscientiousness tend to be bright, organized and proactive and tend to avoid procrastination. Hence, those who present a high Conscientiousness score might avoid the use of SNSs that could interfere with their primary goals (Wilson et al., 2010). As outlined by Andreassen et al. (2012), people with a high Neuroticism score are anxious and shy and may use SNSs as a way to interact easily with other people. The results of the present study did not confirm the hypothesized positive association between Neuroticism and the SNSs addiction. People with a high Neuroticism score feel negative emotions and may also be inhibited in daily activities (e.g., anhedonia), thus including SNSs use. Studies posited that highly extroverted people use SNSs to overtly present themselves (Andreassen et al., 2012; Krämer & Winter, 2008). The present results did not confirm this finding. People with a high Extraversion score are sociable, enthusiastic, adventurous and outgoing. This type of persons tends to find more pleasure in face-to-face interactions rather than those mediated via social networks. In the present study, multiple regression analyses also showed that the BIS (sensitivity to conditioned punishment and tendency to avoid unpleasant and anxious stimuli) and BAS-FS mechanisms (sensitivity to rewarding through fun seeking) correlated positively with the SNSs addiction score. The present findings are in line with Yen et al. (2009). The BIS could promote the use of SNSs as the main, easy and least anxious proxy to fulfill the needs for

social contacts in order to avoid stressful face-to-face/social interactions. Indeed, social network mediated contacts are perceived as less dangerous (e.g., anonymity) and people can easily escape from SNSs. Social networks are also perceived as fun (e.g., people could be pleasured in shaping their own online identity) and intrinsically rewarding (Guedes et al., 2016; "likes", comments, feedback, re-posting). People with a high score on the BAS-FS may more easily develop SNSs addiction as they find surfing on SNSs to be particularly fun.

Coherently with the study hypothesis (Hypothesis 2), mediation analysis showed an indirect effect between Loneliness and Internet addiction mediated by SNSs addiction (Figure 1). Loneliness was associated with SNSs addiction. In turn, SNSs addiction was associated to Internet addiction. This result is coherent with other studies that showed an association between Loneliness and Problematic internet use (Bozoglan et al., 2013; Ostovar et al., 2016; Yao & Zhong, 2014). For instance, it was found that much compromised were face-to-face social interactions (e.g., perception of loneliness) much time end effort people tend to spend on SNSs in order to fulfill their basic need of social contacts (Deters & Mehl, 2013). Those who feel greater level of loneliness tend to perceive themselves unskilled in social interactions and more skilled in SNSs contacts considered as less threatening because the anonymity and the lack of face-to-face interactions (Caplan, 2003). Since SNSs can be used systematically for multiple on-line activities such as texting, gaming, sex dating and streaming multimedia contents, the SNSs addiction could contribute in the development of a more generalized addiction to internet (Griffiths et al., 2016; Kuss et al., 2014; Montag et al., 2015; Müller et al., 2016). This result sustains those studies that view Internet addiction as a sort of umbrella construct which includes a series of differentiated on-line activities (Kuss & Billieux, 2016) that can be reached and performed also using SNSs.

The study's limitations need to be addressed. The cross-sectional nature of the present study limits the conclusions regarding the causal relationship between the investigated variables. A longitudinal study design could address this limitation. Also, it was used a convenience sample. Participants were not recruited through a randomization procedure and thus the results may not be representative of the entire population. Further studies could broaden these findings in other countries and cultures. The association between socio-demographic characteristics (e.g., age, sex, education level, length of time as SNSs users), Big-Five personality traits and SNSs addiction need to be further tested (Andreassen, 2015; Andreassen et al., 2012) also using a cross-cultural approach. Moreover, the present study has been conducted following a social-psychological perspective and thus targeting a not-clinical sample. Further studies on SNSs addiction conducted with a clinic approach could also target a clinical sample. For instance, scholars can examine how SNSs users, of clinical and not-clinical samples, differs in specific individual traits. Since there is a controversy if internet addiction and SNSs addiction can be classified as specific nosological mental disorder (Pies, 2009), additional studies could contribute in deepening the characteristics, diversities and specificities of these conditions in order to enrich the scientific debate concerning the nosological classification of these phenomena.

These limitations notwithstanding, to the best of author's knowledge, the present study represents one of the first attempts to explore the phenomenon of SNSs addiction in the Italian context adding innovative contribution to existing literature. The present study confirms the good psychometric proprieties of the BSMAS measure (Monacis et al., 2017a); also it provides further evidences on the relationship between the Big-Five personality traits, the sensitivity to punishment and rewarding (BIS/BAS-FS system) and SNSs addiction, confirming and broadening previous results (Wilson et al., 2010; Yen et al., 2009) discussing new insights into associations among the studied variables. Moreover, since few studies have been conducted on the relationship between SNSs addiction and internet addiction (Müller et al., 2016), the relationships between Loneliness, SNSs addiction and Internet addiction was deepened (Müller et al., 2014). The present study emphasizes the mediational role of SNSs addictions to fulfill people's need of social contacts and as an antecedent of a generalized internet addiction that can be viewed as a sort of umbrella constructs (Kuss & Billieux, 2016; Montag et al., 2015) in which can be performed a series of on-line activities that can be reached via SNSs.

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# An Italian validation of the Cultural Intelligence Scale: A preliminary study

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❧ ABSTRACT. L'intelligenza culturale (IC) viene definita come la capacità individuale di operare e muoversi efficacemente in situazioni e ambienti culturali differenti. La scala di IC proposta da Ang e colleghi (2007) distingue quattro dimensioni: metacognitiva, cognitiva, motivazionale e comportamentale. Lo studio presenta l'adattamento della versione italiana a 20-item della scala. Un campione di 526 soggetti, che era stato coinvolto in un programma di scambio durante le scuole superiori, ha completato un questionario self-report. I risultati dell'analisi fattoriale confermativa (AFC), con la quale è stata testata la validità della scala, suggeriscono una soluzione a quattro fattori. Inoltre, è stata confermata la correlazione con alcuni costrutti che la letteratura indica in relazione all'IC.

❧ SUMMARY. *Cultural intelligence (CQ) is a multidimensional construct that refers to the capability to function effectively in culturally diverse settings. The Cultural Intelligence Scale (CQS; Ang et al., 2007) distinguishes between metacognitive, cognitive, motivational and behavioural dimensions. This study presents the adaptation of the Italian 20-item version of the scale. A sample of 526 Italian students who had participated to an exchange programme during high school completed a self-report on-line questionnaire. CFA was performed to test the factorial validity of the scale. The criterion validity has been tested exploring correlations between CQ and some constructs expected to be related. CFA confirmed the four-factor structure. The dimensions presented a good internal consistency and they significantly correlated with constructs related to CQ in literature (self-efficacy, resilience, openness to experience). The study contributes to the literature about international mobility experiences and cultural competence providing the Italian version of the CQS.*

**Keywords:** *Cultural intelligence, International mobility, Scale adaptation*

## INTRODUCTION

The increasing number of students involved in international mobility experiences and the different forms of expatriations and international assignments required by organizations (Barmeyer & Davoine, 2012; Desmarais, Ghislieri & Wodociag, 2012) are two important phenomena that recently have lead the attention of some scholars toward international mobility studies (Ang et al., 2007). In this regard, some scholars suggest that internationalization in higher education might predict the development of specific skills and knowledge useful to stay and move abroad and manage efficaciously interactions with other cultures (Crossman & Clarke, 2010).

Generally, intercultural competencies can be interpreted in a variety of ways with various models and they have been defined differently (Deardoff, 2006). As suggested by Deardoff's study (2006), the terminology used by institutions administrators to refer to intercultural competencies is wide; more than six different terms have been used, including cross-cultural competence, global competence, intercultural competence, and global citizenship. Intercultural scholars tend to use various definitions also; some of them focus on behaviour and communication, other on cultural awareness, various adaptive traits, and cultural knowledge, and some others on cognitive cultural processes (Deardoff, 2006). Overall, definitions reflect the different representations between countries regarding the expected competences for academic and professional success; these competences depend also on labour market changes. Matsumoto and Hwang' meta-analysis (2013) has identified some of the latest tools able to capture specific cross-cultural aspects, fostering an explicative approach.

As highlighted by authors (2013), different instruments have been developed to test cross-cultural competences, including for instance *Cross-Cultural Adaptability Inventory* (*CCAI*), *Intercultural Sensitivity Scale* (*ISS*), *Intercultural Development Inventory* (*IDI*), *Intercultural Communication Competence* (*ICC*), *Cultural Intelligence Scale* (*CQS*) and so forth. The present study investigates the psychometric properties of the 20-item Italian version of the CQS developed by Ang and colleagues (2007).

CQ can be generally defined as "an individual's capability to function and manage effectively in culturally diverse settings" (Ang et al., 2007, p. 337). CQ is complex to define due to the similarity to other constructs such as cross-cultural

adaptability, cross-cultural or intercultural sensitivity, intercultural adjustment, intercultural communication competence (Matsumoto & Hwang, 2013).

Moreover, CQ is adaptable as regards the ability to act and reason effectively in various cultural situations (Ang et al., 2007). In other words, CQ transcends cultural boundaries, it is related to acquisition of cultural general capability applicable to whatever culture (Ng, Van Dyne & Ang, 2012).

CQ is a multidimensional construct, applying Sternberg multiple-loci of intelligence framework (1986), it consists of four different dimensions: metacognitive, cognitive, motivational, and behavioural dimensions (Ang et al., 2007; Ng et al., 2012).

The metacognitive dimension concerns with the awareness of mental processes adopted to move in culturally diverse settings. People with high level of metacognitive cultural intelligence tend continually to modify appropriately mental models and interaction strategies considering different cultural norms and assumptions that they have acquired. Metacognitive CQ reflects the ability to acquire and understand cultural knowledge, as well as cultural awareness of appropriate behaviours and interpersonal interactions (Ang et al., 2007).

Secondly, cognitive dimension pertains directly to a knowledge about legal norms, social practices, conventions, economic rules present in other cultures acquired from education and personal experiences. High level of cognitive cultural intelligence allows gathering similarity and differences across cultures also in terms of values systems that leads toward specific way of action.

Thirdly, motivational dimension reflects the desire to learn something about another culture and to act in another culture. This dimension might be conceptualized as an energy that leads toward the knowledge of something that is culturally different from us, based on intrinsic interest and high self-efficacy in cross-cultural competence (Ang et al., 2007; Bandura, 2002; Ng et al., 2012).

At the end, as suggested by Authors, behavioural dimension refers to what people do in a different cultural setting in terms of appropriate verbal and non-verbal actions, language, tone, posture and facial expressions. This dimension implies a wide range of possible behaviour appropriate for various cultural settings (i.e. value systems, practices, norms, conventions and so forth). These facets capture aspects that reflect the direction and energy devoted to culturally appropriate behaviours (behavioural and motivational CQ)

and knowledge of appropriate practices, conventions, value systems (metacognitive and cognitive CQ) (Ang et al., 2007; Ng et al., 2012).

The second purpose of this study is to explore the criterion validity examining the relation between CQ and some individual measures such as self-efficacy, resilience and openness to experience. Especially, as highlighted by Ang, Van Dyne and Koh (2006) all four aspects of CQ seem to be significantly related to openness to experience, a dimension of Big Five that refers to the tendency to be creative, imaginative and adventurous (Ang et al., 2007). "When people are dispositionally open to learning new things and willing to seek out and try out novelty, they have higher metacognitive CQ, cognitive CQ, motivational CQ, and behavioural CQ" (Ang et al., 2006, p. 118).

Self-efficacy, as motivational dimension, appears to be strongly related to CQ, indeed as claimed by Ang and colleagues (2007) high level of motivational cultural intelligence is related to confidence in their cross-cultural effectiveness (Bandura, 2002), that facilitates the adjustment in a different cultural situation. Furthermore, MacNab and Worthley' study (2012) suggests that there is a significant relation between learning cultural intelligence (LCQ) and general self-efficacy. Furthermore, as suggested by scholars also resilience may be a construct related to CQ, in particular it might facilitate interaction in culturally diverse settings, characterized by uncertainty (Reichard, Dollwet & Louw-Potgieter, 2014).

## METHODS

## Participants

The research involved a convenience sample of 526 Italian students who had participated for one year, six months or three months to an exchange school program with a no-profit organization between 1996 and 2011 during their secondary school period. Intercultura (AFS Italy) is an organization that promotes international mobility in secondary schools through the exchange of pupils at the age of 16-17. Researchers contacted participants through both the official Intercultura email address and Facebook page. They completed a self-report on-line questionnaire (Uniquest). The voluntary participation to the research and the anonymity and confidentiality of the data were emphasized. We obtained informed consent by participants.

Among the participants 384 were females (73%) and 142 were males (27%). They were aged 21 to 36 years ($M$ = 27.23, $SD$ = 3.35). Most respondents lived in Italy (77%) while the remaining part lived abroad (23%); furthermore, 31% lived with the birth family, 25% cohabited with the partner, 22% lived with friends or co-workers and 15% lived alone. Of all respondents, 45% worked full-time or part-time, 28% studied and 19% worked and studied at the same time. Concerning educational level, 75% of the sample had a bachelor, master degree or a higher educational qualification. As regards the experience with Intercultural, 75% had spent one year abroad, 15% three months and 10% had stayed six months abroad. Of the whole sample, 40% had left for a destination in North America, 35% in Europe, 10% in Central / South America, 7% in Oceania, 6% in Asia and 2% in Africa.

## Measures

– *Cultural Intelligence* was measured by the Italian translation of the CQS (Ang et al., 2007; see Table 1). The 20 items were translated into Italian; then, an expert performed a back translation that was compared with the original version of the items. Finally, a good correspondence between the original scale and the back translation was found. Respondents were asked to indicate how each statement described their capabilities by means of a 7-point Likert scale (1 = Strongly disagree, 7 = Strongly agree). In line with the original scale, 4 items measured the metacognitive CQ subscale (e.g. "I am conscious of the cultural knowledge I use when interacting with people with different cultural backgrounds"); 6 items were referred to the cognitive CQ subscale (e.g. "I know the legal and economic systems of other cultures"); 5 items measured the motivational CQ subscale (e.g. "I enjoy interacting with people from different cultures"); and finally, 5 items the behavioural CQ subscale (e.g. "I change my verbal behaviour - e.g., accent, tone - when a cross-cultural interaction requires it").

– *Self-efficacy* was detected using 10 items taken from the *Achievement Motivation Inventory* (Schuler, Thornton, Frintrup & Mueller-Hanson, 2002), with a 5-point Likert scale from 1 (Strongly disagree) to 5 (Strongly agree); an example item is "I am confident that I will succeed".

– *Resilience* was measured through 10 items of the *Connor-*

**Table 1** – Italian version of the Cultural Intelligence Scale (CQS)

| Original items | Italian translations |
|---|---|
| Metacognitive | *Metacognitiva* |
| 1  I am conscious of the cultural knowledge I use when interacting with people with different cultural backgrounds. | *Sono consapevole delle conoscenze culturali che uso quando interagisco con persone con diversi background culturali.* |
| 2  I adjust my cultural knowledge as I interact with people from a culture that is unfamiliar to me. | *Sono consapevole delle conoscenze culturali che utilizzo nelle interazioni cross-culturali.* |
| 3  I am conscious of the cultural knowledge I apply to cross-cultural interactions. | *Adatto le mie conoscenze culturali quando interagisco con persone provenienti da una cultura che è per me non familiare.* |
| 4  I check the accuracy of my cultural knowledge as I interact with people from different cultures. | *Controllo l'esattezza delle mie conoscenze culturali quando interagisco con persone di culture diverse.* |
| Cognitive | *Cognitiva* |
| 1  I know the legal and economic systems of other cultures. | *Conosco i sistemi giuridici ed economici di altre culture.* |
| 2  I know the rules (e.g., vocabulary, grammar) of other languages. | *Conosco le regole (ad esempio vocaboli, grammatica) di altre lingue.* |
| 3  I know the cultural values and religious beliefs of other cultures. | *Conosco i valori culturali e le credenze religiose di altre culture.* |
| 4  I know the marriage systems of other cultures. | *Conosco il sistema di matrimonio di altre culture.* |
| 5  I know the arts and crafts of other cultures. | *Conosco le arti ed i mestieri di altre culture.* |
| 6  I know the rules for expressing nonverbal behaviors in other cultures. | *Conosco le regole per esprimere comportamenti non-verbali in altre culture.* |
| Motivational | *Motivazionale* |
| 1  I enjoy interacting with people from different cultures. | *Mi piace interagire con persone di culture diverse.* |
| 2  I am confident that I can socialize with locals in a culture that is unfamiliar to me. | *Sono fiducioso di poter socializzare con la gente del posto in una cultura che per me è sconosciuta.* |
| 3  I am sure I can deal with the stresses of adjusting to a culture that is new to me. | *Sono sicuro di poter affrontare le sollecitazioni di adattarsi a una cultura che per me è nuova.* |
| 4  I enjoy living in cultures that are unfamiliar to me. | *Mi piace vivere in culture che non sono familiari per me.* |
| 5  I am confident that I can get accustomed to the shopping conditions in a different culture. | *Sono sicuro che posso abituarmi alle condizioni economiche in una cultura diversa.* |
| Behavioural | *Comportamentale* |
| 1  I change my verbal behavior (e.g., accent, tone) when a cross-cultural interaction requires it. | *Cambio il mio comportamento verbale (ad es., accento, tono) quando una interazione culturale lo richiede.* |
| 2  I use pause and silence differently to suit different cross-cultural situations. | *Uso pause e silenzi in modo diverso in base alle diverse situazioni interculturali.* |
| 3  I vary the rate of my speaking when a cross-cultural situation requires it. | *Vario la frequenza del mio parlare quando una situazione interculturale lo richiede.* |
| 4  I change my nonverbal behavior when a cross-cultural situation requires it. | *Cambio il mio comportamento non-verbale quando una situazione interculturale lo richiede.* |
| 5  I alter my facial expressions when a cross-cultural interaction requires it. | *Modifico le mie espressioni facciali quando una interazione culturale lo richiede.* |
| Likert frequency scale from 1 – *Strongly disagree* to 7 – *Strongly agree* | Scala di risposta Likert da 1 – *Fortemente in disaccordo a 7 – Fortemente d'accordo* |

*Davidson Resilience Scale* (Di Fabio & Palazzeschi, 2012), with a 5-point Likert scale from 1 (Strongly disagree) to 5 (Strongly agree); an example item is "I tend to bounce back after illness, injury, or other hardships".

– *Openness to experience* was measured by 3 items from the BFQ - *Big Five Questionnaire* (Caprara, Barbaranelli & Borgogni, 2000), with a 5-point Likert scale from 1 (Strongly disagree) to 5 (Strongly agree); an example item is "I am a person who is always looking for new experiences".

## Statistical analysis

The psychometric characteristics of the CQS were examined through a confirmatory factor analysis (CFA) performed by Mplus 7. The CFA method of estimation was maximum likelihood (ML). Several goodness-of-fit criteria were considered: the $\chi^2$ goodness-of-fit statistic; the Root Mean Square Error of Approximation (RMSEA); the Comparative Fit Index (CFI); the Tucker Lewis Index (TLI); the Standardized Root Mean Square Residual (SRMR). Two different solutions were tested, with respectively 1 factor and 4 factors. For comparison of models, the chi-squared difference test was used.

As measure of reliability, Cronbach's Alpha of each subscales was calculated. In order to investigate the criterion validity of the CQ subdimensions, also correlations between them and other constructs, indicated in literature as potentially related to CQ were tested: resilience, self-efficacy, openness to experience (Ang et al., 2006; Ang et al., 2007; MacNab & Worthley, 2012). Finally,

analysis of variance (*t*-test for independent samples) has been calculated based on some demographic variables (gender and having spent other periods abroad) in order to evaluate the capability of the scale to discriminate among different groups. Descriptive data analysis, the calculation of Pearson correlations and Cronbach's Alpha coefficients and the analysis of variance have been performed using the software IBM SPSS Statistics 24.

## RESULTS

## Confirmatory factor analysis

Confirmatory factor analysis was performed on the whole sample, testing two different solutions. Model 1 was a single factor model, tested to address the issue of unidimensionality. Model 2 tested the original 4-factor solution, investigating the dimensions metacognitive CQ, cognitive CQ, motivational CQ and behavioural CQ. Table 2 presents the results of these alternative solutions: Model 2 (4 factors, 20 items) had a statistically significant better fit than both Model 1 (1 factor, 20 items: $\Delta\chi^2 = 1328.13$, $\Delta df = 8$; $p<.001$) confirming the original 4-factor structure: $\chi^2$ (162) = 457.42, $p<.001$; RMSEA = .06 (.05, .07); CFI = .93; TLI = .92; SRMR = .05.

Figure 1 shows the standardized solution; all items loaded on the intended factors with good saturations. In particular, the factor loadings for metacognitive CQ ranged from .61 to .70; the factor loadings for cognitive CQ ranged from .52 to .77; the factor loadings for motivational CQ ranged from .57 to .72; the factor loadings for behavioural CQ ranged from .62 and .81.

**Table 2** – Results of CFA analysis, Goodness of Fit Statistics

|  | $\chi^2$ | *df* | *p* | CFI | TLI | RMSEA | SRMR | AIC | Comparison | $\Delta\chi^2$ | *p* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $M_1$ | 1785.55 | 170 | <.001 | .61 | .56 | .13 | .10 | 31780.39 | $M_1 - M_2$ | 1328.13 | <.001 |
| $M_2$ | 457.42 | 162 | <.001 | .93 | .92 | .06 | .05 | 30468.26 |  |  |  |

*Note.* $M_1$ = 1-factor solution; $M_2$ = 4-factor solution.
*Legenda.* CFI = Comparative Fit Index; TLI = Tucker Lewis Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardization Root Mean Square Residual; AIC = Akaike Information Criterion.

**Figure 1** – CFA (Model 2, 4 factors, 20 items; N = 526): standardized solution
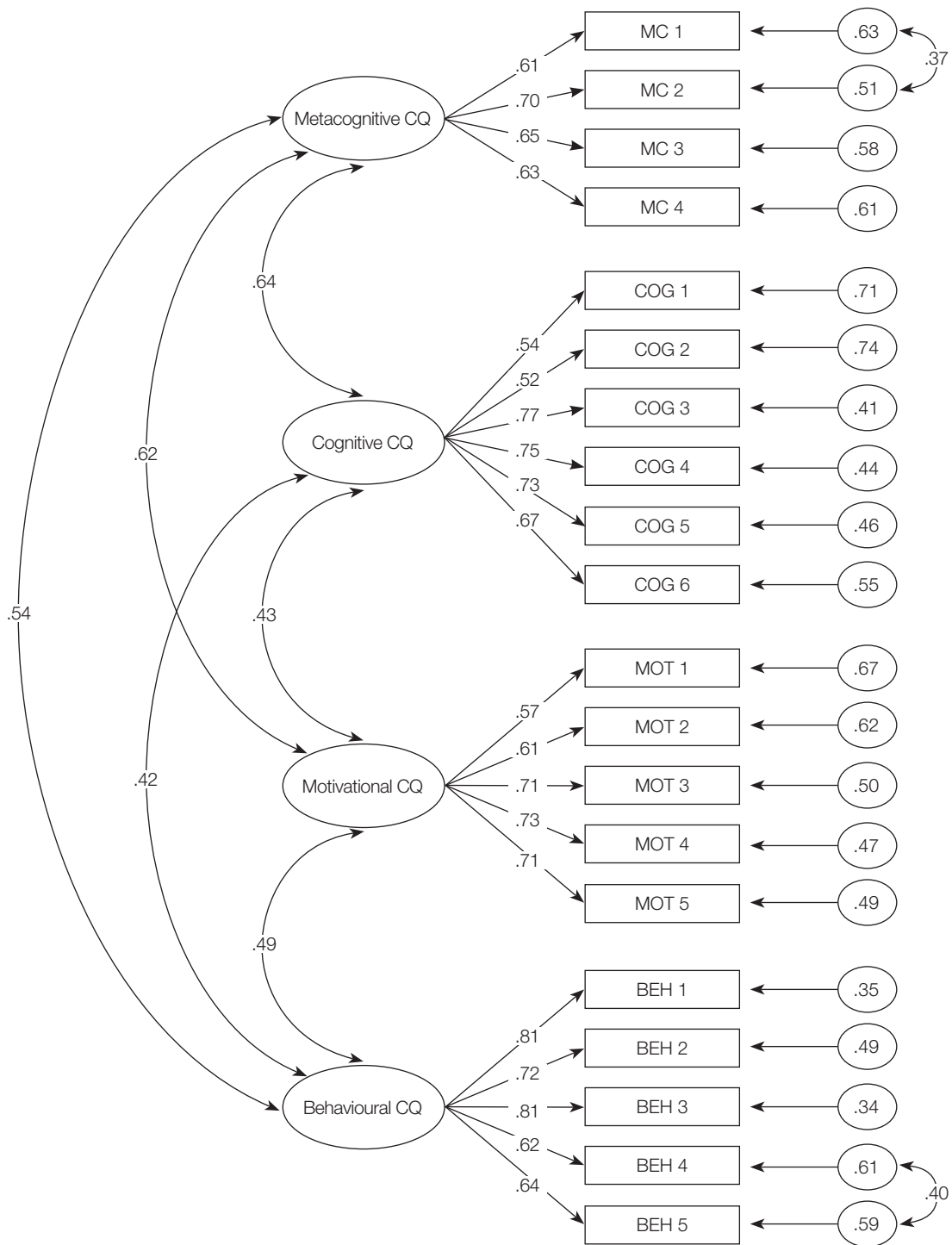


*Note. p<.001.*

The final solution shows the covariance between residuals of two items of metacognitive CQ subscale, MC1 and MC2. They both measure the consciousness of the cultural knowledge used in interaction with people with different cultural backgrounds (MC1) and in cross-cultural interactions (MC2). In a similar way, the solution calculates the covariance between residuals of two items on the behavioural CQ subscale, BEH4 and BEH5. They investigated respectively nonverbal behaviours and facial expressions in cross-cultural situations. The two aspects are correlated since they detect non-verbal communication; the other three items refer to verbal and paraverbal communication.

## Reliability

Table 3 shows reliability and correlations between the four dimensions of CQS. Internal consistency was good, since all values of Cronbach's Alpha met the criterion of .70: Alpha coefficient was .76 for metacognitive CQ, .82 for cognitive CQ, .79 for motivational CQ and .85 for behavioural CQ.

## Correlations with other related dimensions

In order to test the criterion validity of the CQS Italian version, correlation between the 4 CQ subscales and other constructs potentially CQ-related were computed. Table 3 shows that all the four CQ dimensions significantly and positively correlated with resilience, self-efficacy and openness to experience.

Differences in the perception of CQ on the basis of some demographic variables were evaluated through *t*-test for independent sample. Results did not show significant differences for gender. Moreover, people who spent other periods abroad, in addition to the one with Intercultura, showed higher level of metacognitive CQ [$t(524) = 2.68$, $p<.01$; $M = 5.61$, $SD = .89$], cognitive CQ [$t(524) = 7.10$, $p<.001$; $M = 4.95$, $SD = .92$] and motivational CQ [$t(524) = 2.18$, $p<.05$; $M = 6.15$, $SD = .78$] than people who did not spend other periods abroad ($M = 5.40$, $SD = .85$ for metacognitive CQ; $M = 4.34$, $SSD = .97$ for cognitive CQ; $M = 5.99$, $SD = .77$ for motivational CQ).

**Table 3** – Means, standard deviations, correlations and Cronbach's Alphas

|  | M | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|---|
| 1. Metacognitive CQ | 5.54 | .88 | (.76) | | | | | | |
| 2. Cognitive CQ | 4.73 | .98 | .51** | (.82) | | | | | |
| 3. Motivational CQ | 6.10 | .77 | .47** | .36** | (.79) | | | | |
| 4. Behavioural CQ | 5.27 | 1.14 | .44** | .37** | .40** | (.85) | | | |
| 5. Resilience | 4.03 | .48 | .39** | .28** | .43** | .32** | (.78) | | |
| 6. Self-efficacy | 3.70 | .59 | .41** | .27** | .36** | .33** | .67** | (.85) | |
| 7. Openness to experience | 4.44 | .58 | .32** | .25** | .59** | .25** | .37** | .30** | (.70) |

*Note.* Cronbach's Alpha on the diagonal. ** *p*<.01.

## DISCUSSION AND CONCLUSION

The aim of this study was to contribute to the validation of the Italian version of CQS proposed by Ang and colleagues (2007). Results confirmed the 4-factor structure, the reliability and the criterion validity of the Italian scale. The factorial validity of the Italian CQS has been tested through confirmatory factor analysis, which confirmed the presence of four distinct dimensions: metacognitive, cognitive, behavioural and motivational, in line with the original scale (Ang et al., 2007). Moreover, it has been confirmed the correlation between CQ subscales and self-efficacy, resilience and openness to experience in line with literature (Ang et al., 2006; Ang et al., 2007; Bandura, 2002; MacNab & Worthley, 2012; Reichard et al., 2014).

CQ subscales could be useful also for practical implications. This study allows the use of CQ scale in research on cross-cultural competence conducted in Italy. In particular, CQ is evaluated as tool to estimate the impact of the international student mobility. CQ could be developed through international mobility programmes; indeed, as suggested by various researches, international experience could be considered one of the antecedents of intercultural competences (Crossman & Clarke, 2010). "International experience reportedly impacts upon cognition, learning, cultural sensitivity, personal and professional development and employability" (Crossman & Clarke, 2010, p. 602).

Despite the implications, this study has some limitations. The first one is the cross-cultural nature of the study that does not allow to establish a definite causality relationship between variables. Moreover, it is a cross-sectional study whereas it would be appropriate a longitudinal one and test-retest procedure in order to investigate the reliability of the scale. In this study, the sample filled-in the questionnaire only after their mobility experiences. As a self-report questionnaire, acquiescence bias could not be avoided. Future studies should consider also other-report and objective data, such as professors' evaluation for young participants or job performance and career paths for workers. Finally, the sample is not representative.

Taking into account these limitations, nevertheless CQ scale can be considered an appropriate instrument to evaluate cultural intelligence in Italian context.

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# The Italian validation of the Session Impacts Scale: A pilot study

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❧ ABSTRACT. Questo lavoro ha come scopo la validazione della versione italiana della Session Impacts Scale (SIS; Elliott & Wexler, 1994), uno strumento di 16 item originariamente messo a punto per misurare l'impatto percepito durante una sessione di terapia o di consultazione. Dopo la procedura di back-translation, i dati necessari alla validazione sono stati raccolti presso il Dynamic Psychotherapy Service per gli studenti universitari dell'Università di Padova. L'analisi fattoriale esplorativa ha evidenziato una struttura a tre fattori che si sovrappongono a quelli emersi nel lavoro originale. L'attendibilità delle sottoscale è risultata più che discreta. Lo strumento tradotto mantiene così le sue caratteristiche e può essere utilizzato per rilevare dinamiche interpersonali patologiche tra utente e clinico.

❧ SUMMARY. This article reports on an initial validation study of the Italian translation of the Session Impacts Scale (SIS), which is a brief measure of the perceived impacts of therapy sessions. Data were collected from a heterogeneous group of clients seen through the Dynamic Psychotherapy Service for university students. Exploratory factor analysis (EFA) clearly showed the emergence of a three-factor structure, overlapping with the original dimensions called Tasks Impacts, Relationship Impacts, and Hindering Impacts. A second-order EFA confirmed a division between the Helpful Impacts factor and the Hindering Impacts factor. Reliability as internal consistency was very good for Tasks Impacts, Relationship Impacts, and Helpful Impacts scales and discrete for the Hindering Impacts one. Correlations with both the Session Evaluation Questionnaire scales and with a measure of the patients' satisfaction about the consultation process highlighted a discrete convergent validity of the Italian SIS. Also in its Italian version, SIS presents the important feature to detect pathogenic interpersonal dynamics between patient and therapist and should help to avoid the risk of anti-therapeutic relational and technical movements. Further validation studies are needed to replicate the factor structure with a more homogenous sample.

**Keywords:** Session Impacts Scale (SIS), Pilot study, Italian validation, EFA, Psychotherapy

## INTRODUCTION

The unfolding of therapeutic alliance, therapeutic realizations, and therapeutic openness /involvement in the single session can be considered as non-specific session outcomes, that play an important role in the impact of the psychological exchanges between therapist and patient. As a daily psychotherapeutic activity, each therapist performs, either explicitly or implicitly, an evaluation of the session's outcome. Sometimes the therapist has the sensation that good work was achieved, such as when the session was accompanied by a patient's insight or when there was something that, in the therapist's opinion or perception, was a good therapeutic intervention. These session outcomes can have a different impact on the patient. On one hand, the patient can have some feelings about the session that could be described by terms like good *vs* bad or difficult *vs* easy; on the other hand, the session outcomes can be related to a specific topic in a patient's life (e.g., "this is why I did that", "now I realize how this emotion hinders me", and so on). In any case, impact session is defined, according to Stiles et al. (1994), as the "immediate subjective effects, including clients' evaluation of the session, their assessment of session's specific character, and their post-session affective state" (p. 175). It is considered to be an important mediator between process and outcome (Stiles, 1980). To choose the single session as a unit for analysis of the impact seems, accordingly with Elliott and Wexler (1994) and Stiles (1980), to be appropriate, as a session is an intermediate state between the entire therapy and the single speaking turns, allowing for the connection between micro- and macro-analytic views of the therapeutic process. Standing these rationales, the evaluation of the impact aspects of the clinical practice is definitely important, especially when considered from the patient's point of view.

For the clinician, having tools to identify the impact session as perceived by patients is extremely useful for different reasons. For example: they could allow comparing therapist's perception concerning the session's trend with the one's of the patient, in order to understand if the two perceptions are convergent or divergent (this information could be related to the development of the therapeutic alliance); they could help to understand if the therapeutic process, as perceived by the patient, has a positive or negative impact on him/her (to anticipate negative therapeutic reaction); finally, during the training of young clinicians,

they introduce a further, and precious, information source to be used in individual trainee programs.

In the literature, there are two tools devoted to helping the clinician gather this information. The first is the *Session Evaluation Questionnaire* (*SEQ;* Stiles, 1980; Stiles et al., 1994), a self-report tool that asks both patients and therapists about their experiences after a clinical session has just ended. It consists of 27 adjectives in semantic differential scales, divided into three thematic parts: evaluation of the session itself, feelings after the session, and evaluation of the therapist. The second is the *Session Impacts Scale* (*SIS*; Elliott & Wexler, 1994), a 16-item questionnaire that describes the impact experienced by the patient after the session, considering different aspects such as the patient's problems, the patient's progress, etc. The SIS was used to evaluate the processing features of cognitive-behavioral *vs* psychodynamic interpersonal time-limited therapies for depressed patients (Reynolds et al., 1996); it was utilized with other tools to validate the Helping Skills measure (Hill & Kellems, 2002). The SIS was also used to evaluate the evolution of the therapeutic relationship when a critical incident appeared during the session (Janzen, Fitzpatrick & Drapeau, 2008).

Within a research project that is developing in the Psychological Service Assistance–Dynamic Psychotherapy Service (SAP-DPS) of Padua University, a validation of the first tool, the SEQ, was completed (Rocco, Salcuni & Antonelli, 2017). The present work has the aim to start the validation process of the second tool, the SIS, on an Italian population of outpatients.

## SESSION IMPACTS SCALE

### Instrument structure

The *Session Impacts Scale* (Elliott & Wexler, 1994) is composed of 16 items aimed to describe the impact experienced by the patient after the session. Each item is characterized by a label (for example, item 8 is labeled: "Feel relieved, more comfortable") and a short paragraph description (the description for the same item is: "As a result of this session, I now I feel relief from uncomfortable or painful feelings; I feel less nervous, depressed or guilty, or angry in general about therapy").

The items are organized in three subscales. Two of these, the *Task Impact* scale and the *Relationship Impact* scale, are

each composed of five items and refer to helpful impacts; these two scales are then combined to create the 10-item *Helpful Impact* scale. The third scale, *Hindering Impact*, is composed of six items. Finally, a further item, number 17, gives the patient the option to indicate any other perceived important impact. Each item is rated on a five-point adjective anchored scale ranging from 1 (not at all) to 5 (very much).

The respondent was asked to rate the items on the basis of the descriptor that best fit his/her experience.

## Factor structure

Factor analysis (Elliott & Wexler, 1994) has shown three main factors overlapping with the ones predicted by the authors based on their previous cluster analytic research (Elliott, 1985): the *Task Impacts* factor (items 1-5), the *Relationship Impacts* factor (items 6-10; these two factors combined produce the *Helpful Impact* factor), and the *Hindering Impacts* factor (items 11-16). It is necessary to underline that items 4 and 5, which belong to the T*ask Impact* dimension, cross-loaded on the *Relationship Impact* dimension at a level greater than .40. This is true also for item 9, which belongs to the *Relationship Impact* dimension and cross-loaded on the task dimension. Moreover, item number 11, which concerns Unwanted Thoughts, did not load on the *Hindering Impact* factor at the minimum criterion of .40.

## AIM OF THE PRESENT STUDY

The main aim of the authors was to report the first psychometric qualities of the Italian SIS, using data from a pilot study of a clinical group of students recruited at the SAP-DPS. Validity, as well as reliability, is not an immutable property of a given measure. Particularly, a measure may be valid for some populations and for some purposes, but it is never valid in absolute (Boncori, 1993; Thompson, Diamond, McWilliam, Snyder & Snyder, 2005). In fact, at step 10 of their guidelines to the validation process of adapted tests, Hambleton and Patsula (1999) affirm that "…regardless of the interest in cross-cultural comparisons of scores from the two language versions of the test… there is also a need to ensure that the test scores of the newly adapted test are valid and reliable… This may be compiled from factor analytic, experimental, or other correlational information (e.g. predictive or concurrent

validity studies)" (p. 8). From this perspective, our main research questions were related to the structure of the Italian SIS, that is, its underlying dimensions – to analyze its construct validity – and to its reliability. We hypothesized its structure to be consistent with the hierarchical model found in previous research (Elliott, 1985; Elliott & Wexler, 1994).

We also explored the evidence for the convergent validity of the SIS, correlating ratings on its dimensions with scores obtained in the Italian validation of the fourth version of the SEQ (Rocco et al., 2017; Stiles et al., 1994). This is a widely used semantic differential instrument designed to measure two session evaluation dimensions, *Depth* and *Smoothness*, two dimensions of patients' post-session mood, *Positivity* and *Arousal*, and one dimension relating to the therapist named *Good Therapist*. We expected the presence of positive and significant correlations among factors that, in both questionnaires, are positive. On the other hand, we expected a negative correlation between SIS's *Hindering Impact* factor and SEQ's factors. Another tool we utilized to assess the Italian SIS convergent validity was a patients' satisfaction rating concerning perception of both consultation process and clinician's ability to understand and help. We expected discrete to good correlations between the SIS's scores and the patients' satisfaction score indicating that the more the patient feels comfortable and satisfied with the therapist, the more he/she collaborates in the therapeutic work, and the perceived session impact is positive (Elliott & Wexler,1994; Stiles et al.,1994).

## METHOD

Padua University's Psychological Ethical Committee approved this research (Number 1550/2015), and the questionnaire administration took place from September 2015 to July 2016.

The patients considered in this study were students self-referred to the SAP-DPS, in which, within a psychodynamic framework, they received free clinical consultation sessions. SAP-DPS helps students in facing general psychological disease (for instance, difficult problem-solving without cognitive difficulties or fears about entering the job market), relational problems (i.e., conflicts in family life, problems with partners), or more specific ones (such as eating disorders, complicated grieving, anxiety disorders, depression, self-esteem problems, difficulty in managing affects like anger and sadness).

## Participants

All patients, aside from 10 cases who refused to participate in the research for personal reasons, reacted positively to the research we proposed. There were 233 students who participated (*N* = 163 females, 57 males, and 13 who did not declare their gender), they were enrolled in Padua University pursuing various disciplines (about 50% of the students were studying Psychology, 9% Law, and 5% Political Sciences and Engineering). Their average age was 22.88 (*range* = 19-66; *SD* = 3.66). These patients participated in a number of consultation sessions, ranging from 3 to 13.

## Instruments

– *Session Impacts Scale.* The SIS (Elliott & Wexler, 1994) was translated into Italian by two translators independently and was then completed through a reconciliation of the two translations. Subsequently, the Italian version was sent to a native English-speaking proofreader with an excellent knowledge of Italian language for the backward translation. The authors, therefore, reviewed the translations and reached a consensus on any discrepancy in language or content of the items to achieve equivalence between the original and SIS Italian version. Following Beaton et al.'s (2000) suggestion, we adopted a "cross-cultural adaptation" guideline to encompass a process that looks at both language (back-translation) and cultural adaptation (meanings) in preparing the SIS in Italian. When measures are used across cultures, the items should be not only translated linguistically but, if necessary (to maintain both the content and tool's conceptual validity; Beaton, Bombardier, Guillemin & Bosi Ferraz, 2000), they have to be culturally adjusted. This process led to a largely satisfactory coincidence with the SIS original version. The obtained result, which was considered the basis for our study, was comprised, as was the original version, of 16 items organized into three sections. The first section, *Task Impact*, included the first five items, the second section, *Relationship Impact*, contained five items (items 6 to 10), and the third section, *Hindering Impact*, was comprised of items 11 to 16. As for the original version, the Italian version also contains item 17, which gives the patient the option to indicate any another perceived important impact.

– *Session Evaluation Questionnaire.* The previously described SEQ consists of a list of bipolar adjective scales presented in a seven-point (from 1 to 7) semantic differential format (Osgood, Suci & Tannenbaum, 1957), and respondents are instructed to, "circle the appropriate number to show how you feel about this session". The number of items comprising the SEQ has been changed along the line; the number changed from 27 in the fourth version (Stiles et al., 1994) to 21 in the current fifth version (Stiles, Gordon & Lani, 2002). The items are divided into three sections. The first section concerns the session evaluation; it counts 12 items and is prefaced by the stem "This session was …", while the second section, which concerns the post-session mood, counts 12 items and is preceded by the stem "Right now I feel …". Finally, the third section, which examines a patient's evaluation of a therapist, includes three items and is prefaced by the stem "Today I feel my therapist was …" (this section was present only in the patient's SEQ version). Items belonging to the first section of the SEQ fourth version are: bad-good, safe-dangerous, difficult-easy, valuable-worthless, shallow-deep, relaxed-tense, unpleasant-pleasant, full-empty, weak-powerful, special-ordinary, rough-smooth and comfortable-uncomfortable. Items belonging to the second section of SEQ are: happy-sad, angry-pleased, moving-still, uncertain-definite, calm-excited, confident-afraid, wakeful-sleepy, friendly-unfriendly, slow-fast, energetic-peaceful, involved-detached and quiet-aroused. Finally, the items present in the third section of SEQ are: skillful-unskillful, cold-warm and trustworthy-untrustworthy.

For the Italian version of the SEQ fourth form (Rocco et al., 2017), the results essentially confirmed the original factorial structure for the *Depth*, *Smoothness*, *Positivity* and *Arousal* dimensions; the *Good Therapist* dimension overlapped perfectly with the original one. The Italian SEQ showed adequate internal consistency and convergent validity (Rocco et al., 2017).

– *Perceived Satisfaction.* At the very end of the consultation process, a questionnaire about perceived satisfaction in the counseling process was also administered. Using a scale ranging from 0 (nothing) to 100 (very much), patients had to evaluate their perceptions about seven areas: the experience of being listened to and comprehended, the experience of being emotionally engaged, the experience of having a clearer definition of the clinical problem, the experience of having new perspectives on the problem, the experience of having greater self-comprehension,

the experience of general utility, and global satisfaction about the consultation process. At the SAP-DPS, this questionnaire is routinely used to gather an early indication of the global outcome as perceived by patients. Another utilization concerns the qualitative (positive vs negative) analysis of the patient's attitude toward the clinician's ability to both understand and help.

# PROCEDURE

When patients have their first contact with the SAP-DPS secretary service, an initial screening battery is administered by a psychotherapist, including *Symptom Checklist-90-R* (Derogatis, 1983), the *Beck Depression Inventory-II* (Beck, Steer, Ball & Ranieri, 1996), and the *Millon Clinical Multiaxial Inventory III* (Zennaro, Ferracuti, Lang & Sanavio, 2008). Written informed consent asking for students participating in the research was requested by the clinician at the end of first consultation sessions before test administration. All the members of SAP-DPS team, including psychotherapists, psychotherapy trainees, and psychiatrists, received group supervision and had a collegial meeting once a week. The SAP-DPS team monitors incoming patients and provides counselling, both on the basis of single patient clinical characteristics and after consideration of the clinician's competence and availability.

Patients received their clinical interviews from 28 professionals (age $M$ = 35.54, $SD$ = 7.22): 24 psychologists in professional training to become psychotherapists (all females attending psychodynamic training institutes) and 4 experienced dynamic psychotherapists. Counsellors had from 1 to 16 patients each, and all of them met with their clients for at least three sessions. Their clinical experience ranged from one to three years for psychologists in training and from 7 to 21 years for the psychotherapists ($M$ = 5.35; $SD$ = 4.58).

Patient participation in the research was on a free basis, and they knew that if they didn't participate in the research, they would receive exactly the same treatment. Patients were informed that their psychologists or therapists did not have access to the filled SIS (and SEQ as well) questionnaires. For patients who agreed to participate to the research, his or her counselor gave him/her the questionnaires to be filled out after each consultation session. Completed questionnaires were treated as confidential (code/name) and were left in a specific box.

## Statistical analyses

Before carrying out the factor analysis of the Italian SIS, we conducted an item analysis to study the item distribution. In fact, although using factor analysis to summarize the relations of a group of variables does not require particular assumptions concerning the distributions' form, this solution is better if they are normal, because the correlation coefficients are more reliable (Barbaranelli, 2003).

We examined the SIS dimensional structure, mainly basing our examination on Elliott and Wexler (1994). Therefore, in this first pilot study of the Italian translation, we opted for an exploratory factor analysis (EFA), rather than a confirmatory factor analysis (CFA). In fact, as Tinsley and Tinsley (1987) pointed out, hypothesis testing using CFA constitutes a less stringent test of the hypothesized structure than it does performing EFA. On the other hand, Gerbing and Hamilton (1996) and Barbaranelli (2003) stated that EFA can be used prior to analysis techniques to confirm hypotheses on the data structure.

Like Elliott and Wexler (1994), we used principal-axis extraction with Varimax rotation.

To interpret the rotated factor loadings, we followed the rules proposed by Hafkenscheid (1993, 2009): (a) only items with factor loadings of at least +.40 were considered (as in the Elliott and Wexler study), provided that (b) the next largest loading on the other factor(s) was at least .20 lower, and under the condition that (c) there were at least four items fulfilling both inclusion criteria (a) and (b).

We agree with Elliott and Wexler (1994) that the SIS is primarily conceived as a session-by-session measure, thus the session was used as a unit of analysis for the factor analysis instead of the patient. Besides this, EFA is a descriptive rather than an inferential statistical method; for this reason, we considered that the nonindependence of sessions within cases was not a problem (Elliott & Wexler, 1994). Consequently, we carried out a factor analysis of the patients' raw ratings for all the sessions in which they participated.

Reliability analysis was performed by calculating internal consistency coefficients (Cronbach's α).

We tried to ascertain the convergent validity of the Italian SIS, by correlating the scores on the identified dimensions with ratings on *Depth*, *Smoothness*, *Positivity*, *Arousal*, and *Good Therapist* dimensions of the Italian SEQ (Rocco et al., 2017), and with a score of perceived satisfaction with the consultation process obtained by a sub-sample of patients.

# RESULTS

## Item analysis

We calculated the descriptive statistics of the sixteen items of the SIS, excluding item 17; they are presented in Table 1.

Table 1 shows that the distribution of items 12-16, shown in bold, were strongly positively skewed (they exceeded the value + 1, meaning that for these items, low values of the response scale were the most frequent; the high kurtosis indexes indicate that distributions were narrower compared to the normal curve). To normalize the distributions, we applied a log transformation and then we recomputed these items' distribution's skewness and kurtosis. Findings indicated that asymmetry indexes exceeded the value |1| again, but they were a little lower than the ones in bold in Table 1, especially the kurtosis coefficients.

**Table 1** – Item descriptive statistics of the Italian version of the Session Impacts Scale

| Item | M | SD | Skewness | Kurtosis |
|------|------|------|----------|----------|
| 1 | 2.30 | 1.05 | .41 | −.50 |
| 2 | 1.96 | .96 | .70 | −.15 |
| 3 | 2.77 | 1.01 | .07 | −.57 |
| 4 | 2.54 | 1.03 | .22 | −.59 |
| 5 | 2.12 | .93 | .60 | −.08 |
| 6 | 3.27 | .84 | −.09 | −.005 |
| 7 | 2.96 | 1.02 | −.08 | −.44 |
| 8 | 2.72 | 1.10 | .12 | −.76 |
| 9 | 3.28 | 1.04 | −.30 | −.38 |
| 10 | 2.96 | .87 | −.08 | −.14 |
| 11 | 1.95 | .90 | .78 | .35 |
| 12 | 1.27 | .62 | **2.72** | **8.49** |
| 13 | 1.23 | .53 | **2.55** | **6.97** |
| 14 | 1.15 | .49 | **3.67** | **14.27** |
| 15 | 1.54 | .83 | **1.74** | **3.01** |
| 16 | 1.44 | .75 | **1.95** | **4.27** |

*Note. n* = 507 valid sessions; the score range is 1−5.

## Dimensional structure

We performed a principal axis analysis, followed by an orthogonal Varimax rotation for patients' scores for the first sixteen items of the SIS, considering their responses in all the sessions in which they took part in.

Tests regarding whether the correlation matrix could be factor analyzed were all satisfactory; the determinant was higher than 0 (.001, meaning that the variables were not linear dependent), the Kayser-Mejer-Olkin (KMO) test was .89 (that is, the sample was adequate), and the Bartlett sphericity test was statistically significant ($p$<.001, signifying that the correlation matrix was different from the identity matrix).

Cattel's scree-test showed a three-factor solution; the three factors accounted for 50% of the total variance, at 19%, 17%, and 14%, respectively.

Table 2 presents factor loadings and communalities for factors extracted from the Italian SIS. The factor solution is very similar to Elliott and Wexler's (1994) solution. The first factor included the SIS items concerning cognitive benefits deriving from the sessions and corresponds to the factor called *Tasks Impacts*. The second factor comprised four of the five items of the dimension that Elliott and Wexler named *Relationship Impacts*; item 8, "relieved", loaded on both these positive factors, thus it was excluded from further analysis. The third factor included five items concerning negative effects of the sessions and may be referred to the dimension called *Hindering Impacts*; as in Elliott and Wexler's (1994) study, item 11, "unwanted thoughts", did not load on this factor at the minimum criterion of .40, so we did not consider it in future analysis.

Following Elliott and Wexler (1994), we forced the data into a two-factor solution to check if items referring to beneficial effects of the sessions aggregated in a single factor. The analysis yielded the predicted higher-order clustering of task and relationship items into a single *Helpful Impacts* factor; once again, as in Elliott and Wexler's study, the unwanted thoughts item did not reach a loading of .40 on the *Hindering Impacts* factor.

## SIS scores and reliability

Scores on the dimensions measured by the Italian SIS were constructed on the basis of the factor analysis results. Each score was calculated as the mean of the items in bold in Table 2, thus excluding items 8 and 11. The scale range was 1-5, with 3 as midpoint; high scores corresponded respectively to a high perception of *Task Impacts* and *Relationship Impacts (Helpful Impacts)* and to a high perception of *Hindering Impact* by patients. Descriptive statistics and internal consistency are presented in Table 3.

Table 3 shows that the *Relationship Impact* scale received the highest ratings, and the *Hindering Impact* scale received the lowest. Not surprisingly, this latter dimension was positively skewed as the items that constituted it; consequently, we normalized the distribution with a reverse transformation (Barbaranelli & D'Olimpio, 2007). The alphas for the *Task Impact*, *Relationship Impact*, and *Helpful Impact* scales were very good and discrete for the *Hindering Impact* scale.

## Convergent validity

We calculated Pearson's linear correlation coefficients between the SIS first-order dimensions and the *Depth, Smoothness, Positivity, Arousal*, and *Good Therapist* scales of the Italian SEQ. Results are shown in Table 4. Correlations were also computed with a score of perceived satisfaction with the consultation process given by a subsample of 80 patients (see Table 5).

Table 4 shows that the SIS positive impact scores (*Task Impacts* and *Relationship Impacts*) were strongly correlated with the SEQ *Depth* and *Good Therapist* scores, with the correlation between *Relationship Impacts* and *Good Therapist* the strongest. These SIS scores were only weakly and moderately correlated with the SEQ *Smoothness* dimension, suggesting a modest relation to the session's comfort aspect. SIS positive impacts correlations with the SEQ's post-session *Positivity* were at an intermediate level between correlations with *Depth* and *Good Therapist* on the one hand, and with *Smoothness* on the other. Correlations with SEQ's *Arousal* score were modest. As we hypothesized, the SIS's *Hindering Impacts* score was negatively correlated with four SEQ scores, which indicated that sessions higher in *Hindering Impacts* were experienced as rougher and more emotionally negative. The negative relation was strong with *Good Therapist* and moderate with *Depth*, *Smoothness* and *Positivity*, while it was null with *Arousal*. On the whole, the correlations between the SIS and the SEQ dimensions confirm our expectations.

As shown in Table 5, SIS's correlations with the rating of

**Table 2** – First order factor analysis of the Italian SIS

| | Factors | | | |
|---|---|---|---|---|
| | **1** | **2** | **3** | **Communality** |
| 1. *Ho compreso qualcosa di nuovo su me stesso* (Insight into self) | **.79** | .22 | −.021 | .68 |
| 3. *Maggiore consapevolezza. oppure maggiore chiarezza. riguardo sentimenti. esperienze* (Awareness) | **.74** | .23 | −.078 | .61 |
| 5. *Progressi verso la conoscenza di cosa fare riguardo ai miei problemi* (Progress on problems) | **.65** | .30 | .030 | .52 |
| 2. *Ho compreso qualcosa di nuovo su qualcun'altro* (Insight into others) | **.64** | .20 | −.013 | .45 |
| 4. *Definizione di problemi sui quali lavorare* (Definition of problems) | **.61** | .26 | −.003 | .44 |
| 7. *Mi sento sostenuto o incoraggiato* (Supported) | .40 | **.75** | −.093 | .73 |
| 10. *Mi sento vicino al mio psicologo* (Closer to the therapist) | .32 | **.70** | −.20 | .64 |
| 6. *Sento che il mio psicologo mi capisce* (Understood) | .39 | **.67** | −.20 | .63 |
| 9. *Mi sento coinvolto nella consultazione psicologica o incline a lavorare più duramente* (More involved) | .32 | **.64** | −.15 | .53 |
| 8. *Mi sento sollevato. più a mio agio* (Relieved) | .41 | .52 | −.19 | .48 |
| 12. *Troppa pressione o non abbastanza indicazione dallo psicologo* (Unwanted responsability) | .00 | −.16 | **.71** | .53 |
| 14. *Mi sento attaccato o che il mio psicologo non è interessato* (Attacked-rejected) | −.017 | −.215 | **.63** | .44 |
| 16. *Impaziente o in dubbio circa il valore della terapia* (Impatient-doubting) | −.158 | −.208 | **.62** | .46 |
| 13. Sento che il mio psicologo non mi comprende (Misunderstood) | −.042 | −.259 | **.59** | .42 |
| 15. *Confuso o distratto* (Confused-distracted) | −.044 | −.026 | **.58** | .33 |
| 11. *Più disturbato da pensieri spiacevoli o propenso a scacciarli via* (Unwanted thougths) | .051 | .102 | .34 | .13 |

*Note.* The factor loading in bold was significant.

**Table 3** – Means, Standard Deviations, Skewness, Kurtosis, Internal Consistency Reliability (Cronbach's α), and Confidence Intervals (CI) of the Italian SIS

| | N items | M | SD | Skewness | Kurtosis | Reliability | 95% C.I. | |
| | | | | | | | Lower Bound | Upper Bound |
|---|---|---|---|---|---|---|---|---|
| Task Impacts | 5 | 2.38 | .789 | .353 | −.293 | .85 | .83 | .89 |
| Relationship Impacts | 4 | 3.12 | .802 | −.067 | −.310 | .87 | .85 | .88 |
| Helpful Impacts* | 9 | 2.71 | .717 | .143 | −.417 | .89 | .88 | .91 |
| Hindering Impacts | 5 | 1.33 | .471 | **1.96** | **.415** | .76 | .73 | .79 |

*Note. n* = 510 valid sessions; *second order dimension.

**Table 4** – Pearson's r correlations of the SIS with the SEQ scales

| | SIS Dimensions | | |
| SEQ scales | Task Impacts | Relationship Impacts | Hindering Impacts+ |
|---|---|---|---|
| Depth | .53*** | .62*** | −.38*** |
| Smoothness | .12** | .33*** | −.36*** |
| Positivity | .29** | .41*** | −.39*** |
| Arousal | .15** | .18*** | −.01 |
| Good Therapist | .42*** | .66*** | −.52*** |

*Note. n* = 510 valid sessions; ** *p*<.01; *** *p*<.001; + reverse transformation.

**Table 5** – Pearson's r correlations of the SIS Scores with the patients' score of perceived satisfaction with the consultation process

| | Task Impacts | Relationship Impacts | Hindering Impacts+ |
|---|---|---|---|
| Perceived satisfaction | .40*** | .46*** | −.27* |

*Note. n* = 111 sessions; * *p*<.05; *** *p*<.001; + reverse transformation.

satisfaction with the consultation process were in the expected direction: positive and discrete between the beneficial impacts scores and the satisfaction rating and negative and lower between this rating and the *Hindering Impacts* score.

## DISCUSSION

The aim of this pilot study was to assess the validity and reliability of the Italian SIS. The data presented demonstrated the satisfactory psychometric qualities of the SIS in a number of ways.

First of all, construct validity of this instrument was supported in its Italian version; in fact, exploratory factor analysis revealed a structure substantially overlapping with the one found by Elliott and Wexler (1994). In the first-order EFA, they obtained a three-factor solution (*Task Impacts, Relationship Impacts*, and *Hindering Impacts*). Due to cross-loading of three items, they performed a second-order EFA, which showed that items split between *Task Impacts* and *Relationship Impacts* factors loaded on one single factor called *Helpful Impacts*. In the EFA we performed, three factors emerged more clearly; they corresponded with the dimensions called *Tasks Impacts*, *Relationship Impacts*, and *Hindering Impacts*. We also carried out a second-order EFA, which supported the division between a *Helpful Impacts* factor and a *Hindering Impacts* factor. From these dimensions, two items remained excluded: number 8, "relieved", which cross-loaded on the *Task Impacts* and *Relationship Impacts* factors; and number 11, "unwanted thoughts" that, as in Elliott and Wexler's (1999) study, did not reach the minimum loading of .40.

In addition, we can also argue that the pattern of SIS ratings is in line with the process-experiential treatment model. In fact, the highest scores were obtained for the *Relationship Impacts* scale, particularly on the items "supported" and "closer to the therapist", which correspond to the main treatment principle of promoting a genuine and emphatic relationship. This finding further gives support to the construct validity of the SIS (Elliott & Wexler, 1994).

Reliability as internal consistency was good for the *Task Impacts*, *Relationship Impacts*, and *Helpful Impacts* scales and was discrete for the *Hindering Impacts* scale. The corresponding mean scores were below the scale midpoint, except for the *Relationship Impacts* scale. The *Hindering Impacts* score was especially low and was positively skewed, like the scores of every item constituting this dimension. This

result indicates that most of the subjects used the lower points of the response scale when responding to negative statements (items 12-16) about session impacts. Many explanations can be tentatively found for this finding. For example, the subjects might have used the low points of the response scale due to a response bias, or it might be a cultural effect that causes the individual to not utilize negative sentences to make evaluations. It could also be an interaction between the two causes. Another possible explanation could be that patients genuinely evaluated the negative effects of the sessions as very low or of little importance. More deeply, they tended to deny these negative impacts in the very first moments of the counselling process, due to their higher need of help.

We assessed the convergent validity of the Italian SIS by correlating the scores in the obtained dimensions with the Italian adaptation of the SEQ (Rocco et al., 2017) and with an index of the perceived satisfaction in the counselling process given by a subsample of patients. The validity of the first version of the Italian SIS was substantially supported: significant, discrete-to-strong correlations emerged with *Good Therapist* and *Depth* SEQ's scales; correlations were moderate with *Smoothness* and *Positivity*, while they were quite low or null with *Arousal*. This latter result confirms findings by Stiles et al. (1994) and Elliott and Wexler (1994) and, according to these authors, may be considered evidence of the discriminant validity of the SIS scales. From a clinical viewpoint, it is easy to understand that the more the patient feels a deep and positive bond with the therapist and is open-minded and comfortable in the therapeutic relationship, the more the patient abandons defensive processes and lets the therapeutic contact and work unfold, and the more the session impact is perceived as high.

Convergent validity of the Italian SIS was also supported by correlations with an index of perceived satisfaction with the consultation, which was satisfactory, being discrete for both the SIS positive scales and acceptable for the *Hindering Impacts* scale. Following the previous point, the higher the patient's satisfaction and feeling of being understood, the more he/she will let the therapist work, and the session impact increases.

Nonetheless, despite the satisfactory psychometric qualities of the Italian SIS resulting from this pilot study, further validation studies are needed to overcome the main limit of this one, specifically the uneven number of male and female participants, and to reply the factor structure of the instrument.

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