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**A contribution toward the validation of the Junior Eysenck Personality Questionnaire-
Revised (JEPQ-R) in the Italian context. Functioning and meaning of the Lie scale: Social
desirability bias, social conformity, and religiosity.**

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1. GENERAL INTRODUCTION

The aim of this thesis is to provide a contribution toward the validation of the Junior Eysenck Personality Questionnaire-Revised (JEPQ-R) in the Italian context, testing in addition some hypotheses about the meaning and functioning of its Lie scale (social desirability scale).

The work starts with some introductory chapters where the theoretical framework of the thesis is described and where the complex landscape of personality development is presented. The first chapters devote attention to delineating the main theories in the field of personality psychology and to highlighting the relevant role of traits theories, focusing specifically on the development of the Eysenck model. This model, over the years, has inspired many interesting advancements and embodies the findings of many researches. The Eysenck model is very famous and appreciated, and over the last decades has shared the leading position in the scene of personality psychology with the Five-Factor Model (FFM). The FFM is well known, and in literature is often defined as *Big Five* model. Analogously the Eysenck model is frequently labeled *Giants Three* or PEN model, because of the names of the three main dimensions (or traits) at the basis of the theory: psychoticism (or tough-mindedness), extraversion (as opposed to introversion) and neuroticism (as opposed to emotional stability). Over the years Eysenck devoted many efforts to define the basic personality dimensions, eventually identifying these three traits. Hundreds of studies, moreover, focused on providing consistent evidence about their biological foundations, and on developing valid and reliable assessment tools. Eysenck questionnaires, in fact, are widely used and highly considered in many professional or scientific settings, in both adult and junior versions.

Concerning junior questionnaires the last version is the JEPQ-R Junior Eysenck Personality Questionnaire Revised (89 items) (Corulla, 1990). The questionnaire demonstrated good metric characteristics, improved if compared with previous versions, and has been validated in several languages. Despite improvements over previous editions, however, an Italian version of the questionnaire is not available.

The first objective of this thesis therefore is to provide a contribution toward the validation of the instrument (JEPQ-R) in the Italian context. To this purpose the questionnaire was translated and administered to a large sample of adolescents ($N = 595$; aged between 13 and 17), and data were analyzed in order to test the metric characteristics of the Italian translated version. Analyses aim to test: reliability, validity, factor structure, and metric invariance across genders and two age classes (13-15 and 16-17). Methods and results are commented in chapter 5.

Subsequent studies, instead, focus more specifically on the Lie scale of the questionnaire. This scale was included in Eysenck's questionnaires in the 1960s (1964), with the specific aim to detect dissimulation, and is one of the most famous social desirability scales. Social desirability bias is a relevant concern for psychologists and, therefore, many test developers, over the years, have tried to devise scales for the measurement and control of this bias. Social desirability scales, consequently, have become very popular and widely used in many professional settings or in psychological research, especially when self-report instruments are administered. However, despite the considerable evidence supporting their validity, and the improvements performed over the decades to their metric characteristics, these scales are often criticized. Several studies, for instance, have raised doubts about their effectiveness in detecting dissimulation and other scholars suggested, in addition, that these instruments could measure some true substance (a consistent disposition) beyond their original meaning. Social desirability scales, in fact,

have often been found empirically related to many different constructs and behaviors, such as: religious orientation, satisfaction for interpersonal relations, personality traits and organizational behaviors. Interestingly the same Eysenck, author of the Lie scale, recognizing the need to better understand the meaning and functioning of the scale, performed a series of studies, coming to suggest that the scale could have a different functioning across situations. Eysenck specifically, argued that Lie scale might evaluate dissimulation in competitive or high-demanding situations, while in non-competitive contexts might be better conceived as the measure of a consistent disposition tied to social conformity. This hypothesis, specifically, is at the basis of the second study of this thesis.

In this study, dimensionality of Lie scale and its functioning across two situations (standard instructions vs fake-good instructions) are accurately analyzed, using EFA (exploratory factor analyses), CFA (confirmatory factor analysis), PA (parallel analysis), and MGCFA (multiple-group confirmatory factor analysis, model for binary data). Analyses are detailed and focused on understanding if the scale has the same functioning across situations; however, no conclusion is drawn about the exact meaning of the trait underlying the construct, or about the effectiveness of the scale as bias-detector. In subsequent studies in this work, therefore, further analyses were performed to better explore these topics.

The effectiveness of Lie scale in identifying dissimulation tendencies, for instance, is analyzed in the third study. In this research the abbreviated version of the questionnaire (JEPQR-Abbreviated), comprising 24 items only (six item for each scale: PEN-Lie), was used to collect self and informant personality ratings, in a large sample of adolescents ($N=325$; mean age 15.47, $SD = .96$). Informant-reports specifically were ratings provided by one classmate, for each participant. Metric characteristics (reliability and factor

structure) of the Italian version of the questionnaire are carefully analyzed in the first part of the study, while the second part is more specifically focused on evaluating the effectiveness of Lie scale as bias detector. Analyses are performed using different methodologies and results are described in chapter 6.4.2. On an overall plan the study suggests a limited effectiveness of the scale in assessing dissimulation tendencies and provides, on the contrary, some support for an interpretation more tied to a social conformity disposition. This suggestion, finally, is tested in the fourth study.

In this research, specifically, a structural equation model, was tested where all relations between PEN traits, three religiosity facets (intrinsic, extrinsic and quest orientations), and Lie scale (conceived as a social conformity measure) were analyzed, taking into account also the contribution of four sets of values (openness to change, conservatism, self-transcendence, and self-enhancement). The relationship between social desirability scales and religiosity, in fact, even though rather controversial, is well known in literature. In this study, specifically, it is suggested that this curious relationship might be explained, conceiving Lie scale as the measure of a social conformity disposition. It is assumed, in particular, that the relationship between PEN-L traits and religiosity could be mediated by the four sets of values (second-order factors) described in the Schwartz model (Schwartz et al., 2001). Specifically, it is hypothesized that Lie scale, representing a social conformity measure, should have a strong relation with conservatism-related values (security, tradition, conformity), which in turn should have a role in religious experience. In this study some contributions are offered also about the inconsistent relations, described in literature, between the other three PEN traits and religious experience. The work, finally, ends with a comprehensive and systematic discussion of the main findings obtained in the research.

"If a thing exists, it exists in some amount; and if it exists in some amount, it can be measured." (Thorndike, 1914, p. 141).

"Taxonomy is always a contentious issue because the world does not come to us in neat little packages." (Gould, 1981, p. 158)

"Quae ab ira differt, estque aliud iracundum esse, aliud iratum, ut differ anxietas ab angore (neque enim omnes anxii, qui anguntur aliquando, nec, qui anxii, semper anguntur), ut inter ebrietatem et ebriositatem interest, aliudque est amatorem esse, aliud amantem." Cicerone Tusculanae Disputationes IV, 27 (45 B.C.)

"It is one thing to be irascible, quite another thing to be angry, just as an anxious temper is different from feeling anxiety. Not all men who are sometimes anxious are of an anxious temperament, nor are those who have an anxious temperament always feeling anxious. In the same way there is a difference between intoxication and habitual drunkenness, or between being a lover or to be in love." Cicero Tusculanae Disputationes IV, 27 (45 B.C.)

2. PERSONALITY PSYCHOLOGY

Stefano is a very pleasant young man; he likes talking a lot and having fun with friends, music and people. He is, basically, a very good guy, he is conscientious in his work and he likes having a "regular life" with his family and wife.

Cristiano is an introverted boy. He loves being quiet and alone for the majority of his time. His favorite activities are: playing and walking in the country, with his dogs only. He thinks that helping other people and preserving the integrity of the naturalistic habitats should be one of the most important tasks of communities and people. He is a very spiritual individual and he doesn't like following social rules.

Vanessa is a happy teen-ager, she is 16 years old. Even if she is not very conscientious about her school questions and homework she is becoming a little woman. Since she was a little child she has been shy, tender and polite. She likes spending her time watching television, playing on the computer and with few selected friends.

The above descriptions represent typical everyday social considerations. Each of us spends a lot of time gossiping and speaking about the way of being and acting of friends, relatives and acquaintances. Thinking about their usual behaviors and thoughts helps us to predict their behaviors and, as a result provides us with a useful basis for many

decisions. Since antiquity, philosophers, scholars, and common people have been concerned about three main questions regarding individuals: who they are, why they behave that way, and why they have become so. These questions are studied today by the modern science of personality, which develops theories to answer these themes. *"Personality can be defined as a set of distinctive and characteristic thoughts, emotions and behaviors, defining the personal style that individuals use to interact with the physical and social environment"* (Smith, Nolen-Hoeksema, Fredrickson, & Loftus, 2003, p. 474). The core of interest are qualities that distinguish one person from the others, consistent across time and situations and that contribute to the explanation of their behavior, feelings, thoughts, mental life and emotional experiences. Personality psychologists, in other words, are interested in the person as a whole. The study of human universals, individual differences and their reconciliation within a general theory, are key concerns for personality science (Buss, 1984). As stated by Brody *"Personality psychology may be defined as the study of individual differences"* (Brody, 1988, p. 1). Many theories have been proposed, and all approaches inspired specific and important advances in the understanding of personality. These research lines, however, have not reached univocal positions about several fundamental issues. The well-known debate nature-nurture is a classical example of these controversies. Some theories, in fact, emphasized the role of biological predispositions, heritability, and evolutionary influences in determining consistent patterns of behavior, while others stressed the role of learning and situational conditions. The former, analyzed through the study of twins and, especially in recent times, through the use of neuroscience technologies, the genetical basis of personality (e.g. Bouchard, Lykken, McGue, Segal, & Tellegen, 1990; DeYoung, 2010; Nettle, 2006). In contrast, other research lines devoted more attention to learning processes. Behaviorism, for example, emphasized the role of learning and described the conducts of individuals in

terms of reinforcement principles. A basic assumption of traditional behaviorism is that the animal learning principles are necessary and sufficient to explain human behavior too (Staats, 2003).

Another important issue, linked to the previous, is the person-situation controversy. The focus of attention, in this debate, is the understanding of the role of person or situation variables in determining behavior. As stated by Pervin *"Person and situation factors always enter into behavior and the relative amount of consistency or variability will depend on the persons, situations, and behaviors that are considered"* (Pervin, 1989, p. 352). It could be generally assumed that personality dispositions are relatively stable and consistent attributes, with generalized causal effects on behavior; however, the role of situations in determining individual conducts should also be considered.

The previous controversy is, in some way, tied to another central issue: the stability of the characteristics that distinguish one person from another. The debate is centered on understanding if individual characteristics persist over time, from childhood to adulthood or if developments could occur during the life-span. Within the theme of time, another important topic could be identified, and refers to the identification of the best temporal dimension to use when studying personality. Some theories, in fact, suggested that to fully understand the behavior of people, the best way is to look at their past, going back to their childhood. On the contrary, other approaches, addressed their attention to the present and to the usual behavioral patterns of individuals. Finally, other scholars claimed that men act according to the future they expect. Psychodynamic theories, for instance, center their attention on the mind, and place in childhood the origins of many personality and social dispositions. These theories highlight that a lot of mental activities take place outside of awareness. In contrast, phenomenological theories are not interested in unconscious processes but oriented to the study of the experiences consciously made by

individuals in the world around them. These last approaches, like the personal constructs theory, attribute great relevance to people's ability to interpret situations and events, and therefore are more tied to the present or future temporal horizon (Cervone & Pervin, 2009). Kelly, for instance, claimed that: "*Person's processes are psychologically channelized by the ways in which he anticipates events ... and ... persons differ from each other in their constructions of events*" (Kelly, 2003, pp. 7-9). Interestingly, the notion of unconscious still survives today. Recent theorizations pose great attention to the idea that many important processes are implicit or automatic and, in other words, carried out outside of the awareness. Of course, the notion of "unconscious" is different from the concept of implicit processes (Greenwald, McGhee, & Schwartz, 1998); however, their links are very interesting, mostly in recent times, because promising technologies for the assessment of implicit attitudes and dispositions have been devised.

Finally, another relevant issue is the idiographic-nomothetic debate. The idiographic approach emphasizes the value of understanding the uniqueness of each person, identifying the personal dispositions in reacting and interpreting reality. In contrast, the nomothetic view underlines the relevance of searching for general laws and consistent patterns of individual differences, sometimes defined traits (Rushton, Jackson, & Paunonen, 1981). The debate has produced polarized positions, however, some scholars proposed the beneficial effect of integrating both approaches (Hermans, 1988).

Even though individual's uniqueness is not questioned, searching for general characteristics able to account for the individual differences is one of the main objectives of personality psychology. Over the years, therefore, research has devoted many efforts in order to define personality taxonomies. A taxonomy is a conceptual structure for distinguishing, ordering, naming, and eventually measuring objects, types, and groups within a certain field. The development of taxonomies and valid and reliable measures

fostered great advancements in many sciences, as happened for example, in biology with the orderly classification of plants and animals, or in chemistry with the periodic table of elements. The same amount of advancements was, therefore, expected also in the field of personality. A taxonomy should become the systematic framework in which to define the structure of personality, create order, theories, measurements and explanations (John, Angleitner, & Ostendorf, 1988). John and Srivastava, (1999), for instance, wrote:

“What personality psychology needed was a descriptive model, or taxonomy, of traits. One of the central goals of scientific taxonomies is the definition of overarching domains within which large numbers of specific instances can be understood in a simplified way. Thus, in personality psychology, a taxonomy would permit researchers to study specified domains of personality characteristics, rather than examining separately the thousands of particular attributes that make each human being individual and unique. Moreover, a generally accepted taxonomy would greatly facilitate the accumulation and communication of empirical findings by offering a standard vocabulary, or nomenclature.” (John & Srivastava, 1999, p. 102)

Traits theories have been one of the most significant works in this direction, and have attracted great attention over the years, generating influential findings. Traits theories identified in some entities called "traits" the basic dimension of personality. As stated by Allport and Vernon (1930, p. 681) in the field of personality, *“there seem to be virtually as many definitions of personality, character and temperament as there are writers on these subjects”* and the same could be said for the concept of trait. On the other hand, as noted by Pervin (1994), despite the differences between the various definitions of traits, each emphasizing different aspects of these constructs, many personality psychologists would agree with a general description, such as: *“Traits represent a disposition to behave*

expressing itself in consistent patterns of functioning across a range of situations" (Pervin 1994, p. 108). This definition, however, needs attention about two key words: *dispositions* and *consistent*. Even though widely accepted these terms conceal some different points of view among scholars. Regarding the concept of *dispositions*, for instance, it could be noted that traits are conceived as disposition to respond, but some scholars focus on the role of behavior while others extended the meaning of the construct to include also thoughts, feelings, and motives (Pervin, 1994). Buss and Craik (1983, p. 105), for instance, considered "dispositions" "*as summaries of act frequencies or 'act trends'*" that, "*in themselves, possess no explanatory status*", and Funder (1991, p. 32) highlighted that: traits "*can only be inferred on the basis of overt behavior*". In contrast, Allport (1966) used the term "trait" in a broader sense,

"to cover all the 'permanent possibilities for action' of a generalized order. Traits are cortical, subcortical, or postural dispositions having the capacity to gate or guide specific phasic reactions. It is only the phasic aspect that is visible; the tonic is carried somehow in the still mysterious realm of neurodynamic structure. Traits, as I am here using the term, include long-range sets and attitudes, as well as such variables as 'perceptual response dispositions', 'personal constructs,' and 'cognitive styles'". (Allport, 1966, p. 3)

In Allport's view traits are described as "*mental faculties, which might be studied by reference to the characteristic configuration of head or hand*" (Allport, 1921, p. 443). The author, in other words, considered trait as a real structure within persons, having more than nominal existence and with relevant and generalized impact on the behaviors and mental life of individuals (Allport, 1966; Funder, 1991).

Even referring to the term *consistency*, an engaging debate should be mentioned. As pointed earlier, from the theme of person-situation controversy, personality psychology could not exist without contemplating some cross-situational and temporal consistency of behaviors; however, while some authors stressed the role of individual's dispositions, others pointed to the role of situations in determining behaviors. The debate on the "person vs situation" controversy, traditionally, opposes the "pure trait" model, in the opinions of other scholars who questioned this position. The "pure trait" model claimed that "*people show powerful, unmodulated consistencies in their behavior across time and diverse situations*" (Kenrick & Funder, 1988, p. 24). Other scientists, conversely, attributed great relevance also to learning, development and situations, recognizing, for instance, "*that the person's behavior changes the situations of his life as well as being changed by them*" (Mischel, 1973, p. 278) and that people choose or influence their environments. Some authors finally pointed out that the complete invariance of behaviors could be considered as more typical of psychopathology than of "normal" conditions (Kenrick & Funder, 1988). Despite some disagreement among academics about the number, type, or the exact definition of "trait", the description of personality by using these constructs seemed, over the years, more and more convincing. Many scholars today accept the idea that personality could be structured on the grounds of some basic dimensions or traits, relatively consistent over time and situations, and hierarchically organized (Cervone & Pervin, 2009).

The concept of trait has attracted great attention and stimulated a lot of research. Methodological aspects and emphasis on measurement, for instance, are among the most prolific subjects and, in the last decades, relevant advancements have been produced. Using the words of Winter and Barenbaum it could be noted that: "*In devoting an extraordinary amount of attention to issues of measurement and psychometrics, personality*

psychology tried to follow the footsteps of the prestigious 'exact sciences' that had developed so rapidly in the late 19th century" (Winter & Barenbaum, 1999, p. 4). The measurement of personality was stimulated initially, by the growing attention devoted to emerging mathematical techniques such as factor analysis, profitably used in the development of intelligence tests. In last decades, however, with the spread of sophisticated statistical models, and the introduction of software and computers technologies, making the analysis of data easier and powerful, the measurement of personality gained a central position in the psychometric field. Despite some claiming that the emphasis on measurement constrained the scope of investigation to what is easily measureable, neglecting more complex personality processes, its beneficial role and usefulness should not be ignored. The development of modern assessment tools, on the other hand, involved not only the study of mathematical techniques but also the careful analysis of the everyday lexicon. The tradition of lexical approaches, in fact, leads to vivid, realistic and useful descriptions of traits, which are frequently at the center of many lay or scientific conversations. As conveniently explained by John et al. (1988), everyday lexicon represented an irreplaceable source, used by many scholars, for the development of personality assessment tools and theories. Because derived from common language, traits have been, sometimes, labeled as folk constructs; however, this conception is misleading. McCrae, Costa and Piedmont (1993, p. 2), for instance, noted that: "Although the traits themselves are derived from natural language...factors underlying these traits are not necessarily recognizable as folk concepts". Furthermore, Tellegen (1993) highlighted that folk concept of personality could be defined "as common-sense ideas or folk wisdom concerning personality that we share as members of the larger culture" while psychological concepts are: "scientific concepts that have been advanced to describe or explain psychological phenomena and processes and that are expected to meet certain consensual

criteria of internal logic, external testability, and consistency with known facts" (Tellegen, 1993, p. 127). A relevant difference should, therefore, be detected between naive conceptions of traits and the scientific theories which have been devised through a great scientific, empirical and theoretical tradition (Matthews, Deary, & Whiteman, 2003).

Several steps are required for the development of scientific traits theories. First of all, it is important to identify and classify the basic dimensions of analysis and eventually proceed to their measurement. Thereafter in order to reach the formulation of theories able to describe, explain and predict behavior and traits relations, the creation of connections between constructs and actual behaviors is needed (Cervone & Pervin, 2009). In other words, a real trait theory of personality should lead to the identification and measurement of traits, clarify their connections with behaviors, and finally foster the systematizing of knowledge able to describe, explain and predict how traits interact with behaviors. In spite of a substantial agreement in thinking that traits have been useful constructs in creating order and important advancements in the field of personality, some scholars argued their lack on the explanatory side (Epstein & O'Brien, 1985). Science, in fact, needs not only the ability to describe phenomena but also the possibility to explain and predict them. As noted, for instance, by Pervin (1994) the concern about the explanatory or descriptive status of traits led scholars to different positions. Some claimed their descriptive status, some highlighted their explanatory power, others labeled traits as folk construct and finally, others conceived as not truly distinct the first two positions (Pervin, 1994). One of most strong and robust attempts to attribute causality and then an explanatory status to traits is represented by the research about their biological, genetical, and hereditary basis. Brody, for example, stated: *"I assume that personality traits are causal. They are genotypically influenced latent characteristics of persons that determine the way in which individuals respond to the social world they*

encounter" (Brody, 1994, p. 119). The strong explanatory power, the interesting advances produced, and the prestige achieved by the researchers such as Eysenck, who dealt with this subject and produced relevant evidences has made the study of biological basis of traits one the most interesting topics in the field of personality.

A true science of personality, however, should achieve another important task: the prediction of behaviors. The measurements of traits and, in general, their definition have proved to be very useful in this task, but some specification could be proposed. McGowan and Gormly (1976), for instance, highlighted that even though trait scores may be only slightly indicative of specific behaviors, they are really useful for the prediction of behavioral patterns related to the trait score. Funder suggested, moreover, that global traits are useful for explanation purposes, while narrower ones are better for conduct prediction (Funder, 1991). The concept of global or narrower trait introduces the key question of personality structure or hierarchies. Traits as constructs, beyond helping to explain or describe personality and behavior, are certainly useful to delineate the structure of personality identifying hierarchies of traits. Traits theories suggest that people show generic dispositions to respond in a consistent way across time and situations and, that these dispositions are hierarchically organized (Cervone & Pervin, 2009). As noted by Eysenck:

"Let us begin in an examination of the factor structure of personality. It is assumed that we are all agreed that such a structure must be hierarchical, starting with simple (primary) traits at the bottom, and through correlations between them working up to more complex structures at the intermediate level to the major dimensions at the top. The distinction between levels is vital, but difficult to make in practice". (Eysenck, 1992, p. 668)

In spite of the difficulties, however, many scholars, and the same Eysenck, tried to differentiate and classify different kinds of traits and disposition, in order to delineate the structure/hierarchy of personality. As suggested by John et al. (1988, p. 176) one of the first works in this sense was carried out by Galton (1884), but its efforts, like other pioneering researches, were *“relatively unsystematic and had little impact on the field”*. Afterwards other scholars, using a lexical approach, tried to distinguish traits, create taxonomies, and make assumptions about the structure of personality, being however, more systematic. The work of Allport is probably the most famous and massive, and could be considered the lexical basis for the analysis of several other investigators (John et al., 1988). Allport and Odbert (1936) cataloged approximately 18,000 words about personality. As the same authors wrote they composed a list containing *“all the words descriptive of personality or behavior (save those that are obsolete) included in Webster’s New International Dictionary. The edition used (1925) comprises approximately 400,000 separated terms or derivatives”* (Allport & Odbert, 1936, p. 24). Their list contained *“in all 17,953 words, or 4^{1/2} % of the total English vocabulary. A very few common terms, chiefly slang, have been added, but no attempt has been made to follow systematically any other source than Webster’s Dictionary”* (Allport & Odbert, 1936, p. 24). The criterion for inclusion consisted *“in the capacity of any term to distinguish the behavior of one human being from that of another”* (Allport & Odbert, 1936, p. 24). *“Allport and Odbert tried to bring some order to the semantic nightmare they had created”* (John & Srivastava, 1999, p. 103) and catalogued these terms into four columns or categories. In column I the authors listed terms referring to “real” trait: *“generalized and personalized determining tendencies-consistent and stable models of an individual’s adjustment to his environment”* (Allport & Odbert, 1936, p. 26). As the authors stated *“These terms do not imply merely temporary and specific behavior as term in column 2; are more neutral and less censorial than column*

3; and they are less metaphorical and remote in their applicability to personality than those in column 4" (Allport & Odbert, 1936, p. 26). In column II authors listed "term descriptive of present activity, temporary states of mind, and mood". Finally, the third column contained characterial evaluations, and the fourth listed "terms of possible value in characterizing personality, even though they have no certain place in the first three columns" (Allport & Odbert, 1936, p. 27). The work of Allport led the author to the definition of three main kinds of traits: cardinal traits, central traits and secondary dispositions. Cardinal traits express a pervasive and evident disposition that virtually manifests its influence in all life situations. Generally people have a few of these traits. Central traits (e.g., honesty, kindness), otherwise, represent dispositions affecting a limited range of situations. Secondary dispositions, finally, are the less evident, generalized, and consistent. In other words, people have traits with different levels of meaning and generalizability (Cervone & Pervin, 2009). Chaplin, John and Goldberg (1988), taking into account the distinction of Allport, differentiated: prototypical traits viewed as stable, long-lasting, and internally caused and, prototypical states considered temporary, brief, and externally caused. Another interesting distinction was offered by Guilford who wrote: "My own survey of the factors of personality (Guilford, 1959) provides a list that numbers 58. Of these, 18 are considered to be in the area of temperament; 35 are in the area of motivational, or 'hormetic', traits interests and need traits; and 5 are dimensions of attitudes" (Guilford, 1975, p. 810). Cattell, instead, tried to establish some order in Allport's lexical "jungle" by using the potentiality of the emergent factor analysis method, and the new computing facilities. Cattell, using Allport and Odbert's list, developed an interesting model of personality structure and his primary goal was the careful use of quantitative methods for the search of the psychological equivalent of the Mendeleev table (John et al., 1988; Revelle, 2009). Through his work the author came to distinguish

surface and source traits and dynamic, temperamental, and ability traits (Revelle, 2009). Cattell was among the first researchers to make an extensive use of the factor analysis technique in the field of personality. The author, analyzing the relationships between several patterns of traits, identified about 40 groups of correlated traits. Each of these groups represented a surface trait. An important characteristic of these groups was that they were not independent. Surface traits reflect behavioral tendencies, literally superficial, that are in other words, on the surface, and then observable. Cattell, however, was not interested in describing the surface of behavior, but in identifying its underlying psychological structures. The author, in other words, aimed to identify the original features, namely, the internal psychological structures that represent the source of the correlations between surface traits. Cattell identified 16 of these source factors and grouped them into three categories: ability, temperamental and dynamic traits. Ability traits refer to skills and abilities that allow an effective functioning of individuals. Intelligence is an example. In contrast, temperamental traits are related to other life spheres and to the quality and style of behavior. Finally, dynamic traits refer to the motivational life of individuals. Ability, temperamental and dynamic traits were, consequently, seen as able to grasp the main aspects of personality (Cervone & Pervin, 2009).

Beside the abovementioned personality taxonomies one of most known is the Eysenck model. The author researched the most parsimonious model to describe the structure of personality, looking carefully at the biological basis of traits (Eysenck, 1997a). Eysenck argued that the understanding of the biology of traits is a primary goal to reach in order to avoid a circular traits explanation. Eysenck in his work, like Cattell, used factor analysis, and deepened its potentiality and complexity, performing second-order analysis. In contrast to the 16 correlated factors identified by Cattell, Eysenck identified only three

completely orthogonal factors. These, so called super-factors represent the three main consistent traits or stylistic and emotional behavior, which distinguish one person from another. These super-factors should have biological a basis and therefore should be in causal relation to behavior (Di Blas, 2002). Eysenck's model is known also as PEN model, by the name of the three main factors identified by the author: psychoticism, extraversion and neuroticism. Initially, the model included only the last two dimensions, but over time the author understood the relevance of introducing a new factor: psychoticism, which however has been always the most controversial. Eysenck suggested that individual differences in the amount of extraversion-introversion could reflect individual differences in the physiological functioning of the cerebral cortex. The author documented, over his long career, many studies on the biological basis of personality and behavior (Cervone & Pervin, 2009).

Finally, another important taxonomy must be cited: The *Big Five* model or Five-Factor model (FFM). The model gave rise to different and well-validated personality assessment tools. The most known is probably the NEO Personality Inventory (Costa & McCrae, 1992a) and in Italy the Big Five Questionnaire-BFQ (Caprara, Barbaranelli, & Borgogni, 1993). This model has been replicated in many countries and languages around the world and has met over the years great approval by professionals and scholars (McCrae & John, 1992). The *Big Five* model, as suggested by its name, assumes the existence of five main personality dimensions: extraversion, agreeableness, conscientiousness, emotional stability (vs neuroticism) and intellect or openness. These factors should be conceived as personality dimensions at a high level of abstraction and generalizability, which summarize many specific patterns of behaviors. As mentioned before the PEN model comes from a long tradition of research on the physiological basis of behavior that explicitly assumes a biological basis of traits. The *Big Five* model, on the contrary, is a

descriptive model of the main individual differences, but it does not focus on its biological foundations (Di Blas, 2002). Eysenck, therefore, criticized the *Big Five* model and suggested, furthermore, that three of the five factors in the FFM are not primary, often highly intercorrelated, and linked with psychoticism. Eysenck, moreover, pointed out the lack of a nomological network or theoretical underpinning for the five factors, and the failure to provide a biological link between genetic causation and behavioral organization (Eysenck, 1992).

3. TEMPERAMENT AND THE DEVELOPMENT OF PERSONALITY

The study of personality is an interdisciplinary subject involving several different scientific fields and psychological disciplines, each interested in understanding specific aspects of the topic. Cultural psychologists, for instance, are interested in understanding the contribution of societies on individual differences, methodologists in developing personality assessment tools, neuroscientists in identifying the biological basis of traits and behavioral patterns. Traits are central constructs in the field of personality and, being defined as the basic units of study, represent the main foundation for many theories and models in all sectors of psychology. The concept of trait has been developed in the field of adult psychology but in the last decades the construct has been used also in child and developmental psychology. Researchers, in fact, are interested in delineating the main features of personality in childhood and early adulthood and in understanding roots and routes of development and maturation of personality. Traditionally, however, when used for the description of infants or children, traits are more specifically identified as temperamental traits instead of personality traits. *“Temperament is frequently regarded as a constitutional predisposition, observable in preverbal infants and animals, and tied, at least theoretically, to basic psychological processes”* (McCrae et al., 2000, p. 173). This is a general definition; however, many scholars have proposed theories, models and definitions helpful to better understand characteristics and relevant aspects of the construct. A pioneering study, for instance, was carried out by Thomas and Chess (1977) in the New York Longitudinal Study (NYLS). The authors followed the development of a group of subjects from childhood to early adulthood coming to define a set of nine

temperament traits: activity level, rhythmicity, approach-withdrawal, adaptability, threshold, intensity, mood, distractibility and attention span-persistence (Rothbart, 1991; Zentner & Bates, 2008). Through qualitative judgments and factor analysis these dimensions were grouped into three typologies: easy temperament (rhythmicity, predominantly positive mood with mild to moderate intensity, and quick adaptability), difficult temperament (low rhythmicity, high on withdrawal responses to new situations, relatively frequent negative mood of high intensity, and slow adaptability) and slow-to-warm-up temperament (low levels of activity, slow adaptability to new environments or situations, mild intensity in emotions expression, and negative mood) (Hatton, Bailey, Hargett-Beck, Skinner, & Clark, 1999). As stated by the authors they “*conceptualize temperament as the stylistic component of behavior—that is, the how of behavior as differentiated from motivation, the why of behavior, and abilities, the what of behavior*” (Goldsmith et al., 1987, p. 508). Chess and Thomas (1999) although recognizing the role of biological basis of temperament, adopted an interactionist position introducing the concept of *goodness-of-fit*. The authors, in other words, hypothesized that the psychological development should be influenced not only by temperament, but also, by the interaction with the environment and its adequacy. Another relevant position was proposed by two scholars: Buss and Plomin. The authors in this case defined temperament as “*a set of inherited personality traits that appear early in life*” (Goldsmith et al., 1987, p. 508). Their focus, therefore, is on two characteristics which distinguish temperament from other traits: inheritance and genetical basis, and their origin in infancy (during the first year of life). The attention of authors, in fact, was on traits that appear early in infancy providing a foundation for personality, and with a strong inherited aspect, which exclude those traits which arise by events and environment (Goldsmith et al., 1987). Another interesting theory was proposed by Rothbart. In her definition

temperament is a biologically based and relatively stable set of individual differences in reactivity and self-regulation (Derryberry & Rothbart, 1988; Goldsmith et al., 1987). The set of differences for the term reactivity comprises: “*excitability or arousability of behavioral, endocrine, autonomic, and central nervous system response, as assessed through response parameters of threshold, latency, intensity, rise time, and recovery time*” (Goldsmith et al., 1987, p. 510). Self-regulation, in contrast, is defined by: “*processes, such as attention, approach, avoidance, and inhibition; that serve to modulate (enhance or inhibit) reactivity*” (Goldsmith et al., 1987, p. 510). This definition highlights the importance of biological factors and the ability to express and/or regulate typical patterns of emotions and behavior. Rothbart and colleagues identified three broad temperament traits useful in defining important individual differences in infancy and childhood: surgency, negative affectivity and, effortful control (Garstein & Rothbart, 2003; Rothbart, Ahadi, Hershey, & Fisher, 2001; Zentner & Bates, 2008). Even though rather different the above explained theories highlighted the main features of temperament traits. There is, in fact, convergence in defining temperament traits as basic dispositions, relatively consistent, founded on a biological basis but not impervious to experiences and context (Goldsmith et al., 1987). This definition could be retained very similar to that used for personality traits, however, some clarifications can help to better define the concept. Temperament traits are assumed to be behavioral consistencies that appear early in life: the biological foundation for the development of personality and the first manifestation of individual dispositions (Caspi, Roberts, & Shiner, 2004). As reported by Graziano, Jensen-Campbell, and Sullivan-Logan (1998, p. 1273) temperament is “*the biologically based, emotional core of personality*”, the infancy antecedents of adult personality structure. Temperament traits not only appear earlier than personality traits but are also more narrowly defined (Caspi et al., 2004; Shiner, 2010). Temperament, as efficaciously defined

by Graziano et al. (1998, p. 1273) can be described as *“the hard ice ball, around which the softer snowball of personality accumulates developmentally”*. In this light temperament is a *“substrate for personality development, consisting of simple, basic styles that emerge early and that are closely tied to distinctive modes of emotional expression”* (Hartup & Van Lieshout, 1995, p. 658).

How personality grows, changes and evolves still remains a matter not completely clarified and worthy of more research efforts. The approaches proposed in the last decades, however, have suggested several mechanisms and factors useful to better understand the developmental paths of personality. In other words, researchers speculated about how environment and inherited/genetic characteristics interact in order to elaborate cognitive and affective representations, which are frequently and quickly available. Shiner and Caspi (2003), for instance, proposed six mechanisms: learning process, environmental elicitation, environmental construal, social and temporal comparisons, environmental selection, and environmental manipulation. These mechanisms emphasize the role of temperament in influencing how people learn, reinforce or extinguish their behavioral patterns in accordance with environment. Temperament is assumed to interact with the choices, interpretations and manipulation of ambient, which in turn have an influence on temperament (Shiner & Caspi, 2003).

An interesting model was proposed by McAdams and Pals (McAdams, 1995; McAdams & Pals, 2006). This model divides personality into three aspects: dispositional signature, characteristic adaptations and personal narratives. The former are conceptualized as traits or characteristics, consistent individual differences in how people think, feel and behave, in different situations and moments. Characteristic adaptations, instead, represent a broader set of motivational, social-cognitive, and developmental dispositions, which differ from traits because more specific and tied to context. Finally, personal

narratives are stories and explanations that people build, with increasing frequency and salience from adolescence, in order to give sense and orderliness over time to their lives and identities (Shiner, 2010). During growth temperament traits develop and become personality traits, which in turn over time get more and more defined and complex. As previously emphasized, their evolutionary paths are still not completely clear but it is supposed that environment and its interactions with specific individual differences have a central role. Moreover, a relevant role could be attributed also to individual differences in cognitive and emotional development. Year after year, children and young people learn new and more sophisticated strategies to respond to situations and demands of contexts. The structure of personality, therefore, changes following the children's development of new skills, sense of self, and abilities in the regulation of emotions (Tackett, 2006). This aspect puts the attention on the relation between traits development and individual growth or maturation. In this regard it can be interesting to recall the temperament taxonomy of Rothbart. Mary Rothbart and colleagues suggested the existence of three broad temperament trait able to define many individual differences starting from infancy (Garstein & Rothbart, 2003; Rothbart et al., 2001). The first of these dimensions, as previously mentioned, is surgency. This trait describes children's preference for high intensity situations or high activity level. Surgency is also characterized by lack of distress in social situations and quick responsiveness. The second trait identified by Rodbhart and colleagues is Negative Affectivity and describes children prone to express and experience a wide range of negative emotions, such as sadness, anxiety, anger, frustration, insecurity, fear, discomfort with irritating or painful sensory stimulation, and difficulties in settling after being aroused. This trait can be separated into two components: internalizing (fear, withdrawal, sadness) and externalizing negative emotions (anger, irritability, frustration) (Caspi et al., 2004). Negative Affectivity has been linked to the biologic structures which

promote behavioral responses to threats (Shiner, 2010). Finally, the third trait has been named effortful control and reflects the ability to regulate and constrain behavioral manifestations, but, it can be expressed also through the ability to sustain attention and persist at tasks. The development of this trait has been tied to biological differences in the executive attentional systems which develop across childhood. In fact, evidences suggest that the ability to focus attention in infancy helps in predicting effortful control in later childhood (Kochanska, Murray, & Harlan, 2000; Shiner & Caspi 2003). These three dispositions, in the theory of Rothbart and colleagues, are the temperamental basis of personality. It is interesting to note that, these dispositions recall and bind three traits of mature personality assessed by many theories, models, and questionnaires (e.g., Cattell & Mead, 2008; Costa & McCrae, 1992a; Eysenck & Eysenck, 1991). Surgency, for instance, is related to extraversion or positive emotionality which involves characteristics such as: sociability, assertiveness, talkativeness, and high activity (Bruck & Allen, 2003). The negative emotionality disposition, in the Rothbart taxonomy, conversely, can be tied to the mature trait of neuroticism. This trait describes emotional instability, fear, guilt, sadness, anger, embarrassment, disgust and difficulty in coping with stress. Finally, effortful control can be likened to the trait of conscientiousness which identifies people who are purposeful, determined, punctual, reliable, organized, strong-willed, and usually able to reach scholastic or organizational success. To these three dimensions the Five-Factor Model adds two more: agreeableness and openness to experience. Agreeableness describes individuals who are helpful, empathetic, well-hearted, cooperative, and good-natured. Highly agreeable children are characterized as warm, considerate, empathic, generous, gentle, and protective of others. The final *Big Five* trait: openness-to-experience or intellect depicts openness to experience, such as an active imagination, aesthetic sensitivity, intellectual curiosity, preference for variety, independence of judgment and

the desire to entertain new and original ideas and values. This last trait, however, received less support than others (Caspi et al., 2004; Shiner, 2010). The proximity between some temperamental dispositions and other traits typical of the mature personality introduces the theme of traits continuity and consistency. Some research has argued that there is a relevant continuity in personality traits from childhood to adolescence and adulthood (Caspi & Roberts, 2001; Shiner & Caspi, 2003). Other evidences, in contrast, indicated that changes may occur during the all life span and that personality consistency peaks in adulthood later than expected. Some scholars supposed that personality traits are essentially fixed and defined around age 30, but more recent studies have found that individual differences in personality continue to change through adulthood, even if only modestly after age 50. Evidences, in other words, indicate that personality development does not stop in childhood or adolescence, but continues during adulthood. In the first years of infancy and childhood there is a "rapid" personality development, and in the adolescence period the concrete possibility of evident changes exists, but only small changes can be reasonably expected during adulthood and maturity. During infancy and adolescence young people clearly express a broad range of personality differences, and many of these are tied to significant similarities in their adult personality. These early personality differences are very meaningful and tied to the subsequent life outcomes. Childhood and adolescence are very relevant stages of life, characterized by rapid biological, social, and psychological changes. During adolescence for instance there is an evident physical development which involves body, hormonal and sexual changes, (around age 11 for girls and age 13 for boys) followed by a growth in the social environment (Soto, John, Gosling, & Potter, 2011). Adolescence is assumed to be a formative period which leads the child to the adulthood (Klimstra, Hale, Raaijmakers, Branje, & Meeus, 2009). This stage is characterized by the passage from being an infant,

who needs care and guidance, to becoming a person with ideas and independence. Furthermore, during adolescence there is an improvement in the identity status stability (Meeus, Iedema, Helsen, & Vollebergh, 1999), and in the ability to manage social and affective relations (Furman & Buhrmester, 1992). These biological and psychosocial changes are reflected also by changes in personality traits. Recent empirical studies, for instance, highlighted that traits such as: emotional stability and openness increase after the first adolescence (Branje, Van Lieshout, & Gerris, 2007; Klimstra et al., 2009; Pullmann, Raudsepp, & Allik, 2006). Furthermore, another set of personality traits has been strongly tied to adolescence: "sensation seeking traits". These dispositions reflect a feeling of boredom susceptibility and the search for experiences, novelty, thrill, adventure, disinhibition, and intense sensory stimulation (Arnett, 1994; Arnett, 1996; Zuckerman, Eysenck, & Eysenck, 1978). Many scholars agreed that sensation seeking reaches a peak during adolescence and declines throughout the individual's lifetime (Arnett, 1994; Zuckerman et al., 1978). Steinberg et al. (2008), in fact, found age differences in sensation seeking linked to pubertal maturation, with sensation seeking increasing between 10 and 15 and declining or remaining stable thereafter. Sensation seeking traits have been repeatedly tied to participation in reckless behaviors and risk taking propensity (Zuckerman, 2007), maybe because these activities often provide novel and intense stimulation as sensation seekers desire. Several studies have found relations between sensation seeking and many dangerous behaviors, such as: dangerous driving (Arnett, 1990; Arnett, Offer, & Fin, 1997; Dahlen, Martin, Ragan, & Kuhlman, 2005; Zuckerman & Neeb, 1980), sexual experiences (Donohew et al., 2000; Spitalnick, et al., 2007) alcohol, nicotine and drug use or abuse (Comeau, Stewart, & Loba, 2001; Martin, et al., 2002), antisocial behaviors (Arnett, 1996; Pérez & Torrubia, 1985), etc. Sensation seeking traits are, furthermore, associated with a variety of other personality features

from the *Giants Three* (PEN) or *Big Five* (FFM) models of personality. Glicksohn and Abulafia (1998), for instance, through factor analysis found relations between the traits of the Eysenck model of personality (Eysenck, 1992) and the sensation seeking traits as assessed through the Sensation Seeking Scale-V of Zuckerman (Zuckerman et al., 1978). It appears; therefore, rather evident that adolescence should be recognized as a life stage of great interest above all in the field of personality psychology (Soto et al., 2011). In fact, adolescence is not only useful in the understanding of personality development, but is also a critical stage, linked to high risk situations. The study of personality psychology in adolescence, in other words, should aim not only to try to understand developmental paths, but concentrate also attention on life outcomes, in order to create intervention programs dedicated to help young people to cope with their difficulties and risks. However the advance in knowledge of adolescent personality needs more research efforts, and needs to be supported by the measurement of various indicators of personality, able to assess changes and stability also in longitudinal ways. From this point of view an important area of study should be the construction and refinement of personality assessment tools.

4. THE EYSENCK MODEL

The Eysenck model is one of the most famous in the field of personality and is known also as *Giants Three* or PEN model, because of the names of the three main dimensions (or traits) at the basis of the theory: psychoticism (or tough-mindedness), extraversion (as opposed to introversion) and neuroticism (as opposed to emotional stability).

The *Giants Three* and the *Big Five* models (or Five-Factor Model; FFM), over the last decades, have towered on the landscape of personality research, and both have found relevant applications in the scientific or professional fields; however their bases are very different. The *Big Five* model, in fact, is grounded on the lexical approach to the study of personality (McCrae & Costa, 1997; McCrae & John, 1992) while the *Giants Three* is more oriented in identifying basic biologically founded personality dimensions (Barrett, Petrides, Eysenck, & Eysenck, 1998; Cervone & Pervin, 2009). The PEN model embodies many years of study, and hundreds of researches aimed at testing the model, its biological foundations, and its adequacy in clinical or scientific settings (Eysenck & Eysenck, 1991). Neuroticism (vs emotional stability) and extraversion (vs intraversion) were the first traits included in the model. These two dimensions were conceived as two orthogonal *continua*, defining the psychological space of personality traits. According to the author this organization is strongly supported in literature, and is close to the ancient Galen-Kant-Wundt scheme of the four temperaments (Eysenck, 2013; Eysenck & Eysenck, 1991) (Figure 1). These two traits, moreover, are strongly supported in factor analysis studies and their biological bases have been described by Eysenck (Eysenck, 1956; Eysenck, 1967; Eysenck & Eysenck, 1991; Eysenck & Prell, 1951).

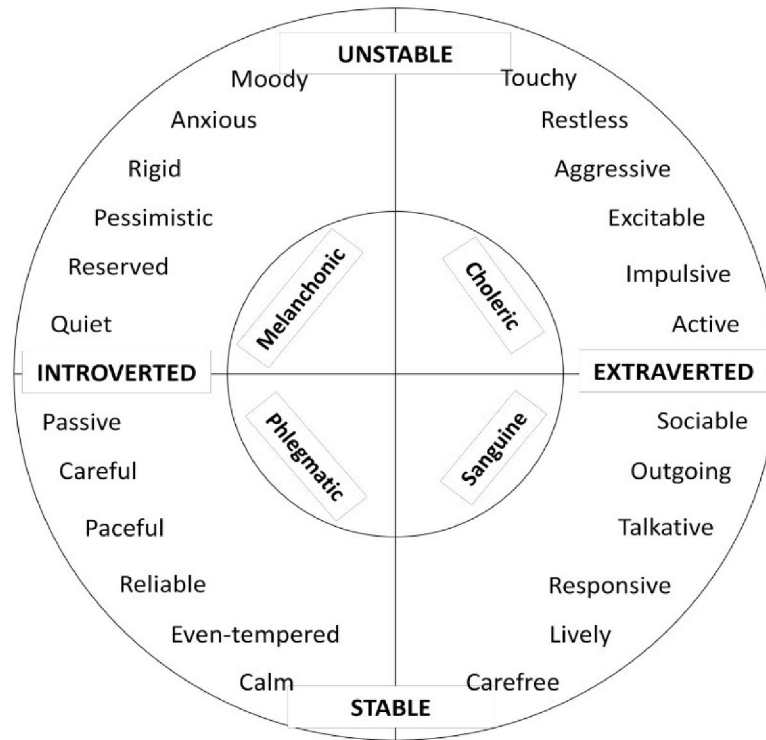


Figure 1: Representation of relationship between the four classical temperaments (using Wundt's schema) and adjectives related to extraversion (introverted–extraverted) and neuroticism (stable–unstable) (Figure adapted from Eysenck & Eysenck, 1991).

The basic suggestion of the author was that N (neuroticism) should be related, in some level, to the lability of the autonomic nervous system, while E (extraversion) to the central nervous system excitation and inhibition. It was, moreover, supposed that introverts, being more excitable, should achieve a greater cortical arousal in response to life events; intense social experiences, therefore, could cause a great and unpleasant feeling of excitement that these individuals should prefer to avoid. In contrast, extraverts having a lower arousal should be more interested in stimulating activities and in excitement seeking (Cervone & Pervin, 2009). Extraversion, in fact, in the view of Eysenck describes individuals: sociable, carefree, optimistic, talkative, active, sometimes aggressive, and in some degree impulsive, audacious and foolhardy (Eysenck & Barrett, 2013; Eysenck & Eysenck, 1963; Eysenck & Eysenck, 1991). Some studies, moreover, highlighted

interesting links with sensation seeking traits (Eysenck & Zuckerman, 1978; Zuckerman, 1994). The typical introvert, on the contrary, is: quiet, introspective, interested in books rather than people, reserved, distant, and seldom aggressive.

Neuroticism, the second dimension, instead describes: anxious, depressed, moody and worrying individuals. High levels of N are frequently tied to great emotionality and to the difficulty to return to a peaceful feeling after arousing experiences. With an easy definition N-individuals could be described as: worriers. Stable individuals, in contrast, could be defined as: calm, even-tempered and controlled individuals. This side of the *continuum* describes people having weak and slow emotional reactions (Eysenck & Barrett, 2013; Eysenck & Eysenck, 1991).

In 1952 (Eysenck, 1952; Eysenck & Eysenck, 1991) the author argued the usefulness of adding a third dimension to his model: psychoticism. This trait was supposed to be independent from E and N, and present in varying degrees in all subjects, like the other two dimensions. Eysenck, in particular, suggested that, just as neurosis would be conceived as the pathological exaggeration of the underlying trait of neuroticism, so psychosis could represent an exaggeration of the underlying psychoticism disposition. According to the author, however, these dimensions should not be interpreted as pathological manifestations in themselves but rather as the description of basic personality traits, which could be in some way tied to the development of extreme or abnormal conditions (Eysenck & Eysenck, 1991). Specifically, as suggested by Eysenck, the trait of psychoticism, relabeled also as tough-mindedness describes individuals cold, impersonal, lacking in empathy, aggressive, unfriendly, untrusting, rude, unmannered, and unemotional. Psychotics, moreover, were described as subjects liking unusual things, and showing disregard for danger and the sensitivity of other individuals (Eysenck & Barrett, 2013; Eysenck & Eysenck, 1991). Research, in addition, highlighted over the years some

relationships between this trait and the development of dependencies (Eysenck, 1997b; Gossop, 1978) or criminal behaviors (Rushton & Chrisjohn, 1981). This dimension was added as last in the Eysenck model, and although widely studied by the author and other researchers to find support for its definition and biological foundations (e.g., Eysenck & Eysenck, 1991; Gattaz, 1981), this trait remains the most controversial of the theory. A great debate, for instance, is linked to both its definition and measurement. This trait, in fact, is characterized by a considerable complexity and by many different facets: impersonality, unconventionality, coldness, unreliability, cruelty. This complexity could be likely tied to the undefined position of the trait in reference to other constructs, and to the psychometric weaknesses often associated to its measurement. Eysenck, in fact, worked hard over the years, not only to provide biological and conceptual support to his theory, but also to create valid and reliable measurement instruments. The author, in particular, devoted great attention to developing questionnaires using rigorous and detailed factor analysis methods. The Maudsley Medical Questionnaire-MMQ (Eysenck, 1952), was the first questionnaire created and was designed to assess N only, through 40 items. Subsequently, however, also the *continuum* introversion-extraversion was added to questionnaires, as the Maudsley Personality Inventory-MPI (Eysenck, 1959). These questionnaires were, on the other hand, followed by a new revision: the Eysenck Personality Inventory-EPI (Eysenck & Eysenck, 1964). The refinements of this questionnaire were mainly tied to: improvements in metric characteristics (in this edition N and E were independent, in contrast with the MPI where dimensions were slightly related), reformulation of some items in order to make the questionnaire easily understandable also for people with a low educational level, and the introduction of a new scale labeled Lie (forms A and B), specifically developed for the measurement of dissimulation tendencies. A further progress towards the complete formulation of Eysenck

questionnaires was achieved in 1975 with the creation of the Eysenck Personality Questionnaire-EPQ (Eysenck & Eysenck, 1975). In this questionnaire, beyond N, E and Lie, a new scale or dimension was included, labeled psychoticism (P); which however, was completed and revised in the following work of the author: the Eysenck Personality Questionnaire-EPQ-Revised (Eysenck, Eysenck, & Barrett, 1985; Eysenck & Eysenck, 1991). The revision was mainly aimed at correcting psychometric weaknesses highlighted in the previous version, in particular, on P scale (Claridge, 1981). Specifically, the limits were: low range of scoring in both the male and female samples with standard deviations similar to the respective means, and a marked skewness (Bishop, 1977; Block, 1977). Although P scale has always been the most controversial, in the last decades Lie scale has also been at the center of an intense debate, which still stimulates interesting discussions. One among the most relevant topics, for instance, is focused on understanding whether the scale, originally developed as bias or dissimulation detector, could be better conceived as a social conformity measure.

Questionnaires based on the Eysenck theory are well known and have been translated and adapted for use in many countries, demonstrating high cross-cultural validity (Eysenck & Barrett, 2013). Furthermore, also the short and abbreviated versions of the questionnaires: EPQR-S (Eysenck Personality Questionnaire Short Revised, with 48 items) (Eysenck & Eysenck, 1991; Eysenck et al., 1985), and EPQR-A (Eysenck Personality Questionnaire Revised- Abbreviated, with 24 items) (Francis, Brown, & Philipchalk, 1992) are very diffused and appreciated and their psychometric characteristics have been widely supported by the international research. These instruments, in fact, despite metric properties poorer than the full version, are often used with interesting results for professional or scientific purposes, mostly when measuring personality is useful but a 100-items questionnaire might be too long.

As previously highlighted the PEN(-L) model, over the last decades, has shared the scene with the FFM model (Five-Factor Model). Many comparisons have been made between the two theories in order to provide evidence about the validity of questionnaires, contributing at the same time to the identification of the most effective representation of personality. Results often indicated a substantial overlap between the two extraversion measurements (PEN and FFM), and between N (PEN) and emotional stability (FFM). Not surprisingly, on the other hand, P-dimension (PEN) raised some uncertainty. Specifically, as suggested by several authors, this trait seems to show a substantial overlap with three dimensions of the FFM, namely: agreeableness, conscientiousness and openness or intellect. Some research for instance, also in the Italian context, jointly factor analyzed scales from PEN and FFM questionnaires, and found that the Eysenck P loaded on the same factor or was related to agreeableness, openness and conscientiousness of the FFM (e.g., Barbaranelli, Caprara, Rabasca, & Pastorelli, 2003; Draycott & Kline, 1995; Heaven, Ciarrochi, Leeson, & Barkus, 2013; McCrae & Costa, 1985; Saggino, 2000; Scholte & De Bruyn, 2004). It should be noted, however, that other scholars provide support to the view that agreeableness and conscientiousness are basic, higher-order factors of personality, and should be conceived as independent dimensions of personality, as the *Big Five* model claims (Costa & McCrae, 1992b; Costa & McCrae, 1995). The debate about the best number of factors useful to describe personality, in fact, remains an open issue. As suggested by several authors, in future research it could be important to devote attention to several different psychology techniques beyond factor analysis, that alone cannot provide a definitive answer. Interesting suggestions, for instance, might be achieved by the new development in the neuroscience field, which could help in providing new confirmations or evidence about the biological substrates of personality, clarifying eventually the best basic traits needed to explain personality.

Eysenckian PEN(-L) traits have long been studied and related to a great amount of different constructs, providing a relevant contribution to the development of theories in many fields of psychology. A great attention to PEN traits, for instance, has been devoted in clinical, organizational, social and development areas of psychology. Junior versions of the Eysenck questionnaires have been, in fact, created and translated into many languages (Eysenck & Barrett, 2013). Junior and adult versions have had a similar evolution, and share also the same number of factors (PEN-L) and metric weaknesses. Some studies, for instance, highlighted for P junior scale the same problematic questions found in adult versions, and other researches confirmed the same concerns between adult and junior Lie scale (Corulla, 1987, 1990; Eysenck, Nias, & Eysenck, 1971). Despite the abovementioned uncertainty areas, Eysenck questionnaires remain very popular and appreciated instruments in many countries, mostly taking into account the strong support provided to the model by the careful studies concerning their biological bases (Cervone & Pervin, 2009). These studies, in fact, have been performed using several and sophisticated techniques, such as: studies with twins, and genetics or psychobiological methods (Eysenck, 1967).

As a result of the carefully tested metric characteristics, the simplicity that allows its use in many contexts, and its high cross-cultural validity, Eysenck questionnaires are very diffused, and often preferred to instruments based on other models. However, further research efforts will be needed in order to understand in detail the number and nature of the basic dimensions useful in describing personality, contributing at the same time to the improvement of assessment tools.

5. A CONTRIBUTION TOWARD THE VALIDATION OF THE JUNIOR EYSENCK PERSONALITY QUESTIONNAIRE-REVISED (JEPQ-R) IN THE ITALIAN CONTEXT

The Junior Eysenck Personality Questionnaire Revised (JEPQ-R) (Corulla, 1990) is an instrument specifically developed for the assessment of three basic personality dimensions among young people, and is founded on Eysenck's model (Eysenck & Eysenck, 1975; Eysenck & Eysenck, 1991). The instrument represents the last refinement of the Junior Eysenck Personality Questionnaire (JEPQ) proposed by Eysenck in 1975 (Eysenck & Eysenck, 1975). The questionnaire measures three main personality dimensions: psychoticism (P), extraversion (E), and neuroticism (N). Furthermore, as in the adult versions, a fourth scale, labeled Lie (L), is included (Eysenck & Eysenck, 1964; Eysenck & Eysenck, 1975; Eysenck & Eysenck, 1991; Eysenck et al., 1985). Neuroticism (N) was the first dimension introduced in the Eysenck model and, in opposition with emotional stability, describes worried people, moody, fed-up, irritable, nervous, apprehensive, emotional, and tense. The second dimension added to the model was extraversion (E), and defines excitement, impulsivity, liveliness, activity, sociability, talkativeness and low reliability. The third scale, psychoticism (P) or tough-mindedness, was included in the Eysenck theory and questionnaires as the last, and due to its unclear nature and metrical weakness is the most controversial (Bishop, 1977; Block, 1977; Claridge, 1981; Eysenck & Eysenck, 1975; Eysenck et al., 1985). This dimension describes different qualities, such as: coldness, impersonality, hostility, low emotionality and lack of empathy or human feelings. Psychotics are depicted as unfriendly, untrusting, rude, unmannered, unhelpful

and antisocial people (Eysenck & Barrett, 2013). This dimension is referred to also as the predisposition to develop psychiatric anomalies or psychotic breakdowns (Eysenck & Eysenck, 1991). Finally the Lie scale, added to Eysenck questionnaires starting from 1964, was designed to measure dissimulation or the tendency to deceive (EPI; Eysenck & Eysenck, 1964). Some research, however, has questioned the meaning and functioning of the scale, suggesting that under certain condition it should be interpreted as a real personality dimension characterized by social acquiescence, conformity, "social naiveté" or "lack of insight" (e.g., Eysenck & Eysenck, 1991; Eysenck et al., 1971; Jackson & Francis, 1998; Massey, 1980; McCrae & Costa, 1983; Michaelis & Eysenck, 1971; Nias, 1973). Eysenck scales and questionnaires are well known, appreciated, validated and used in many countries around the world, for clinical, scientific and professional purposes. The *junior scales*, for instance, have been translated into several languages: Japanese (Iwawaki, Eysenck, & Eysenck, 1980), Hungarian (Eysenck, Kozeki, & Gellenne, 1980), Danish (Nyborg, Eysenck, & Kroll, 1982), Greek (Eysenck & Dimitriou, 1984; Kokkinos, Panayiotou, Charalambous, Antoniadou, & Davazoglou, 2010), Thai (Kline, Barrett, & Svasti-Xuto, 1981), Romanian (Grigoroiu-Serbanescu, 1986), Austrian (Eysenck & Renner, 1987), Icelandic (Haraldsson & Eysenck, 1987), Swedish (Eysenck, von Knorring, & von Knorring, 1988), Egyptian (Eysenck & Abdel-Khalek, 1989), Spanish (Perez, Anglada, & Guitart, 1990), Catalanian (Eysenck, Garcia-Sevilla, Perez, & Ortet, 1994), Dutch (De Bruyn, Delsing, & Welten, 1995; Scholte & De Bruyn, 2001), Welsh (Francis & Thomas, 2008), Bengali (Roy, 2012; Eysenck & Rahman, 1991), Singaporean (Eysenck & Long, 1986), and French (Rothen et al., 2008).

The Eysenck personality scales, as well as the underlying theory, over the years, have long been studied. Many research efforts, for instance, have been devoted to studying relations between PEN-L scales and several life outcomes or individual differences. Evidences have

showed that the four scales bind to many constructs and behaviors, particularly salient during youth, such as: sensation seeking, risk taking, social/anti-social behavior or sexual habits (e.g., Carrasco, Barker, Tremblay, & Vitaro, 2006; Center, Jackson, & Kemp, 2005; Fisoun, Floros, Siomos, Geroukalis, & Navridis, 2012; Van Dam, Janssens, & De Bruyn, 2005). Furthermore an interesting research line, extended in many cultures, highlighted relevant relations between PEN-L scales and religiosity. Evidences indicated that religious people are generally low in P and high in L scores, while, concerning N and E less univocal relations have been found (e.g., Francis, 1992; Francis, 1993; Francis & Katz, 1992; Francis, Lankshear, & Pearson 1989; Francis & Pearson, 1993; Francis, Pearson, & Kay, 1988; Maltby, 1999).

Another important topic investigated over the last decades, refers to the relations between PEN dimensions and traits proposed by other taxonomies. These researches seem, particularly, helpful to better understand the nature of PEN traits, and in providing some support for the Eysenck theory. Findings of a study, involving young participants, for instance, showed relations between the Eysenck scales and dimensions measured by the EATQ-R temperament questionnaire, proposed by Rothbart, (Capaldi, & Rothbart, 1992; Ellis & Rothbart, 2001). Specifically, strong relations have been found between EATQ-R extraversion/surgency scores and JEPQ extraversion, and between EATQ-R negative affectivity scores and JEPQ neuroticism, while psychoticism relations appeared less defined (Cliniciu, 2012; Muris, Meesters, & Blijlevens, 2007). Psychoticism relations are the least clear even when PEN traits are compared to the dimensions of the Five-Factor Model (FFM). Among researchers there is agreement in thinking that N and E should be conceived as basic personality factors, substantially similar in both models, but the P position is less defined. Some studies, in fact, showed that P could be viewed as a super-factor strongly related to three dimensions from the Five-Factor Model (FFM)

agreeableness (A), conscientiousness (C) and openness-intellect (O) (e.g, Barbaranelli et al., 2003; Draycott & Kline, 1995; Heaven et al., 2013; McCrae & Costa, 1985; Saggingo, 2000; Scholte & De Bruyn, 2004).

As previously highlighted Eysenck questionnaires have been translated into many different languages, demonstrating high cross-cultural validity. On an overall plan, although cross-cultural studies confirmed the factor structure of the instruments, P dimension, not surprisingly, has often been found problematic; therefore, further evidences are always strongly encouraged (Eysenck & Barrett, 2013). P scale is the most undefined and psychometrically limited (Claridge, 1981) of Eysenck Questionnaires (*adults and junior versions*). Specifically, three psychometric shortcomings have been pointed out: grossly skewed distribution, low internal consistency, and low range of scoring in both males and females with standard deviations similar to the respective means (Bishop, 1977; Block, 1977). These weaknesses have been mainly referred to adult scales and, over the years, the authors performed a series of revisions to improve P psychometric characteristics (Eysenck et al., 1985). As reported by Corulla, the JEPQ-P scale suffers the same psychometric limitations as the adult version (Corulla, 1987, 1990). The author, therefore, decided to revise the scale in order to improve these weaknesses. The final version of the JEPQ-Revised, devised by Corulla, was published in 1990 and comprises 89 items, eight more than the original version (JEPQ) (Eysenck & Eysenck, 1975), divided into four scales: P (25 items), E (25 items), N (20 items) and L (19 items). The questionnaire was refined through factor analysis and by rewording or changing some items. The psychometric properties of the revised questionnaire were tested in a large sample of young people aged between 11 and 15 and results confirmed the four-factor structure as well as the improvement of the psychometric weaknesses (see paragraph 5.1.2.1.). Its use is then recommended. In the Italian context, however, the

metric proprieties and the factorial structure of the revised version have never been tested, and only few studies have been carried out, using previous JEPQ versions (e.g., Barbaranelli et al., 2003; Vidotto, Cioffi, Saggino, & Wilson, 2008).

The objective of this work, therefore, is to test with an Italian sample the metric properties of the JEPQ-Revised in order to facilitate its use. More specifically, the present research intends to examine reliability indices, convergent validity, scale distributions, and the factor structure of the JEPQ-R, using multiple-group analysis. Multiple-group analysis allows not only to verify the structure of the questionnaire but also to test its stability across different groups. In this research multiple-group analysis aimed to test the meaning and appropriateness of the JEPQ-R across gender and two age classes 13-15 and 16-17.

5.1. METHOD

5.1.1. PARTICIPANTS AND PROCEDURE

Participants were 595 Italian adolescents (Male 241, Female 354) aged between 13 and 17 years ($M=15.58$, $SD= 1.020$). Students were recruited in two Italian regions and all were Italian native speakers. Questionnaires were administered collectively during school hours and completion occupied around 30 minutes. Measures were collected by researchers and the instructions given before completion advised participants to be honest and quick in their answers. In order to ensure anonymity individual numbers were allocated and respondents had to provide only three personal details: gender, age and mother tongue. A total of 67 students, after a four week interval, completed retest. During retest sessions some students ($N=207$; male 100; mean age 15.88, $SD = .968$, 14-17

years) answered the Italian version of another well-known personality questionnaire: BFQ-2 (Big Five Questionnaire-2; Caprara, Barbaranelli, Borgogni, & Vecchione, 2007).

5.1.2. INSTRUMENTS

5.1.2.1. Junior Eysenck Personality Questionnaire–Revised (JEPQ-R)

The Junior Eysenck Personality Questionnaire–Revised (Corulla, 1990) is an 89-item self-report questionnaire used to assess, among young people, three dimensions of personality: Psychoticism (25 items; e.g., Do you seem to get into a lot of fights? Would you feel very sorry for an animal caught in a trap?), extraversion (25 items; e.g., Have you got lots of friends? Would you rather sit and watch than play at parties?), and neuroticism (20 items; e.g., Do you worry for a long while if you feel you have made a fool of yourself? Do you worry about awful things that might happen?). The questionnaire also includes a Lie scale devised to detect dissimulation and socially desirable responding (19 items; e.g., Do you always say you are sorry when you have been rude? Have you ever said anything bad or nasty about anyone?). The response to each item is dichotomous: yes/no.

The Junior Eysenck Personality Questionnaire is a well-known questionnaire widely used around the world; however, three psychometric weaknesses have been pointed out in the P scale: skewed distribution, low internal consistency and low range of scoring. As reported by Corulla (1990), after his scales revision, the three psychometric limitations suffered by previous versions were considerably reduced. Internal consistency and range of scoring for the revised P scale, in fact, increased. In the revised version reliability coefficients, among subjects aged 11-15 years, range from .68 to .82 instead of the lower values (ranging from .43 to .74) reported by Eysenck (Eysenck & Eysenck, 1975). The

range of scoring also increased, with mean ranging from 8.69 to 5.04 (instead of ranging from 1.95 to 5.19 as reported by Eysenck and Eysenck, 1975). The four-factor structure was also confirmed.

Despite its usefulness and the improvements to its metric characteristics, an Italian version of the questionnaire is not currently available, nor have its metric proprieties or factor structure been tested in Italian samples. In the present study, therefore, the scale was translated from English to Italian by the author of this thesis and then back-translated by a native English speaker. In this step, in order to ensure cultural equivalence and an easy understanding of questions, two items of P scale were reworded. Specifically, item 8 (Do you think sniffing glue is dangerous?) was translated as “Do you think sniffing chemical substances, that may give ‘strange’ effects, is dangerous?”, while item 87 (Do you think football hooligans are bad people?) was translated as “Do you think extreme football supporters are bad people?”. These items were reworded because in the Italian context “hooligans” and “glue sniffing” are not popular concepts. Moreover in all questionnaire items “child-children” were translated as “peer-peers”, because these terms seemed more suitable for a questionnaire intended for adolescents (in this study aged between 13 and 17).

5.1.2.2. Big Five Questionnaire-2 (BFQ-2)

The BFQ-2 (Caprara et al., 2007) is a well-validated Italian instrument, which assesses the five personality traits of the FFM: energy or extraversion (dynamism and dominance facets), agreeableness (cooperativeness and politeness facets), conscientiousness (scrupulousness and perseverance facets), emotional stability (emotion control and impulse control facets), and openness (openness to culture and openness to experiences facets). The questionnaire comprises 134 items with a five-level Likert scale (“Absolutely

false for me" to "Absolutely true for me") and a Lie scale (14 items) is also included. Reliability and validity of the scale have been well documented and the factor structure showed a high stability (Caprara et al., 2007).

5.1.3. STATISTICAL ANALYSES

Descriptive statistics, scale distributions, and correlations were calculated using SPSS version 17, while factor structure was tested through confirmatory factor analysis (CFA) performed using Mplus 7 (Muthén & Muthén, 2012). In the tested models the four factors were PEN-L dimensions while indicators, in order to reduce the number of variables, were combined into 20 parcels (five parcels for each factor). Dimensionality of PEN-L scales was verified, and factor loadings of single-factor CFAs were used for the construction of balanced parcels as suggested in the *item-to-construct balance* procedure (Little, Cunningham, Shahar, & Widaman, 2002). CFA-models were performed using items as indicators and WLSMV as estimator (weighted least squares mean and variance-adjusted) (Muthén & Muthén, 2012). This method was recommended for models involving categorical observed data (e.g., binary or ordinal) (e.g., Brown, 2006; Flora & Curran, 2004), as items comprised in JEPQ-R. Metric invariance of the four-factor was tested across gender and two age classes (13-15 and 16-17 years), using Multiple-Group Confirmatory Factor Analysis (MGCFA). Specifically, in the first step the model was fitted on different groups simultaneously, in order to test configural invariance (the same pattern of fixed and free factor loadings specified across groups), while in the second step the model was compared to a more constrained model (equality of factor loadings), to support metric invariance (Brown, 2006). Four-factor models were tested using

Maximum Likelihood Robust estimator (MLR), which is robust to non-normality. MLR has been shown to be the most accurate estimator when the distribution of scores deviates from a normal distribution, and is an extension of MLM that can include missing data (Brown, 2006; Muthén & Muthén, 2012; Yuan & Bentler, 2000). A variety of indices were used to evaluate model fit: chi-square statistic, Standardized Root Mean Square Residual (SRMR) (Bentler, 1995), Comparative Fit Index (CFI; Bentler, 1990), Tucker Lewis index (TLI; Tucker & Lewis, 1973) and Root Mean Square Error of Approximation (RMSEA) (Browne & Cudeck, 1993; Steiger & Lind, 1980) with its 90% confidence interval (90% CI) and test of close fit (CFit) (Browne & Cudeck, 1993). A solution fits the data well when CFI and TLI values are above or close to .95 (between .90 and .95 acceptable fit) (Hu & Bentler, 1997; Hu & Bentler, 1999). Good fit of the model to the data is supported also by SRMR values less than .08 (Hu & Bentler, 1999), and RMSEA values smaller than .05 (values between .05 and .08 indicate a moderate fit) with the CFit non-significant (Browne & Cudeck, 1993).

To compare nested models two indices were used: the $\Delta\chi^2$ (chi-square difference) test, developed by Satorra and Bentler (1994; 2001), and the Δ CFI (tests of change in CFI). Model fit equivalence is supported by $\Delta\chi^2$ non-significant and Δ CFI less than, or equal to |.0-1| (Cheung & Rensvold, 2002).

Reliability was assessed through *KR-20* coefficient (Kuder-Richardson formula 20; Kuder & Richardson, 1937). This coefficient is analogous to Cronbach's α , but is a measure of internal consistency more suitable for dichotomous response scales (Bajpai & Bajpai, 2014; Cortina, 1993; Kuder & Richardson, 1937). Furthermore an alternative reliability index was evaluated: composite reliability. This coefficient is similar to α because it represents an estimate of true variance relative to total variance and can be easily computed in structural equation modeling framework:

$$\rho_{\eta} = \frac{(\sum_{i=1}^p \lambda_i)^2}{(\sum_{i=1}^p \lambda_i)^2 + \sum_{i=1}^p \text{Var}(\varepsilon_i)}$$

where λ is the factor loading of the indicators, and $\text{Var}(\varepsilon_i)$ is its residual variance (e.g., Bentler, 2009; Fornell & Larcker, 1981; Geldhof, Preacher, & Zyphur, 2014; Raykov, 2001; Raykov & Shrout, 2002). Composite reliability even if conceptually similar to α is a more accurate assessment of reliability with congeneric but not τ -equivalent measures (Raykov, 2001). In this study composite reliability coefficients were calculated for each scale using both WLSMV (dichotomous items) (Bentler, 2009) and MLR (parcels) factor loadings (Raykov & Marcoulides, 2011). Values greater than .60 are generally considered acceptable (Bagozzi & Yi, 1988).

5.2. RESULTS

5.2.1. DESCRIPTIVE STATISTICS, SCALE DISTRIBUTIONS AND INTERCORRELATIONS

Descriptive characteristics of PEN-L scales were computed on the total sample and separately for each group. Results are displayed in Table 1. As shown in the table Mean and *SD* are consistent with those of the English version of Corulla, and for P scale the improvements over the original version are confirmed (mean ranging from 1.95 to 5.19 in the age group of 11-15; Eysenck & Eysenck, 1975). In the total sample kurtosis and skewness are all acceptable, ranging between -1 and +1 (Field, 2009; Marcoulides & Hershberger, 1997; Muthén & Kaplan, 1985). On the other hand, P scale, as in the original

version, is rather leptokurtic and positively skewed (mostly in the female sample); however, its distribution indices are improved if compared to the English version.

Total Sample											
		N	Minimum	Maximum	Mean	SD	Variance	Skewness		Kurtosis	
								Statistic	SE	Statistic	SE
	P	595		15	5.015	3.025	9.153	.961	.100	.930	.200
	E	595	2	25	18.232	4.255	18.108	-.835	.100	.417	.200
	N	595	1	20	11.805	4.583	21.002	-.251	.100	-.775	.200
	L	595		17	7.371	3.435	11.800	.444	.100	-.333	.200
Male-Females											
MALE	P	241		15	6.079	3.305	10.923	.762	.157	.143	.312
	E	241	2	25	18.710	4.239	17.965	-.956	.157	.846	.312
	N	241	1	20	10.083	4.430	19.626	.131	.157	-.736	.312
	L	241	1	17	6.959	3.180	10.115	.483	.157	.009	.312
FEMALE	P	354		15	4.291	2.584	6.677	.960	.130	1.427	.259
	E	354	3	25	17.907	4.242	17.994	-.776	.130	.218	.259
	N	354	1	20	12.977	4.312	18.594	-.537	.130	-.340	.259
	L	354		17	7.653	3.575	12.783	.384	.130	-.536	.259
Age classes											
13-15	P	235	0	15	5.123	3.139	9.852	1.027	.159	1.007	.316
	E	235	3	25	18.345	4.143	17.167	-.832	.159	.561	.316
	N	235	1	20	11.400	4.803	23.070	-.184	.159	-1.023	.316
	L	235	0	17	7.464	3.635	13.216	.474	.159	-.398	.316
16-17	P	360	0	15	4.944	2.951	8.710	.905	.129	.846	.256
	E	360	2	25	18.158	4.331	18.758	-.836	.129	.343	.256
	N	360	1	20	12.069	4.420	19.536	-.278	.129	-.581	.256
	L	360	1	16	7.311	3.302	10.900	.406	.129	-.321	.256

Table 1: Scales descriptive statistics for total, male, female, younger and older adolescents groups.

The correlation matrix between the four scales was analyzed and results are consistent with expectations (see Table 2). In general, correlations are not very high and in the expected directions. The negative correlation between P and L is the higher ($r = -.492$). This finding is consistent with the results of the original version and also with the

evidence obtained in other research in the Italian context, involving adults (e.g., Corulla, 1990; Dazzi, 2011).

	P	E	N	L
P	1			
E	.234**	1		
N	.069	-.146**	1	
L	-.492**	-.291**	-.225**	1

Table 2: Scales intercorrelations on total sample (* $p \leq .05$, ** $p \leq .01$).

5.2.2. RELIABILITY

Reliability analyses for each dimension were conducted for the whole sample and for different groups: male/female and two age classes. Coefficients α were calculated using *KR-20* formula (Kuder & Richardson, 1937). As reported in Table 3, excluding P which is slightly below, results for all scales are higher than .70.

P results, even if lower than in the English version (α ranging between .68 and .82) (Corulla, 1990), are improved if compared to evidences reported for the previous editions (α ranging between .43 and .74) (Eysenck & Eysenck, 1975).

	P	E	N	L
Total sample	.68	.78	.83	.72
Male	.69	.81	.81	.68
Female	.61	.76	.83	.75
13-15 years	.70	.76	.85	.75
16-17 years	.66	.79	.82	.71

Table 3: *KR-20* coefficients for PEN-L scales.

Four week test-retest reliability was verified on a sub-sample of 67 participants. All coefficients are satisfactory and provide evidence for temporal stability of the Italian version (psychoticism=.83, extraversion=.74, neuroticism=.79, and lie=.75). Reliability was assessed also by computing composite reliability coefficients. These model-based coefficients are consistent estimators of scale reliability and can be computed in the factor analysis framework. Composite reliability was verified using both WLSMV (item level) and MLR (parcel) factor loadings. Results are satisfactory for all scale, P included, with both estimation methods (WLSMV; psychoticism = .87, extraversion=.90, neuroticism=.91 and Lie=.85) (MLR; psychoticism =.70, extraversion =.80, neuroticism =.85, Lie =.74).

5.2.3. VALIDITY

5.2.3.1. FACTOR STRUCTURE

In order to verify the factorial structure of the Italian version of JEPQ-R a four-factor model was tested in the total sample and factors were allowed to correlate. The model is presented in Figure 2 and fitted the data well: $\chi^2(164) = 301.51$, $p \leq .001$; CFI = .96; TLI =.95; RMSEA = .038 [.031, .044], Cfit =.999; SRMR =.047. Although the χ^2 was significant, the other indices satisfied their respective rules of thumb. The higher correlation, in accordance to expectations, was between P and L factors, and was negative.

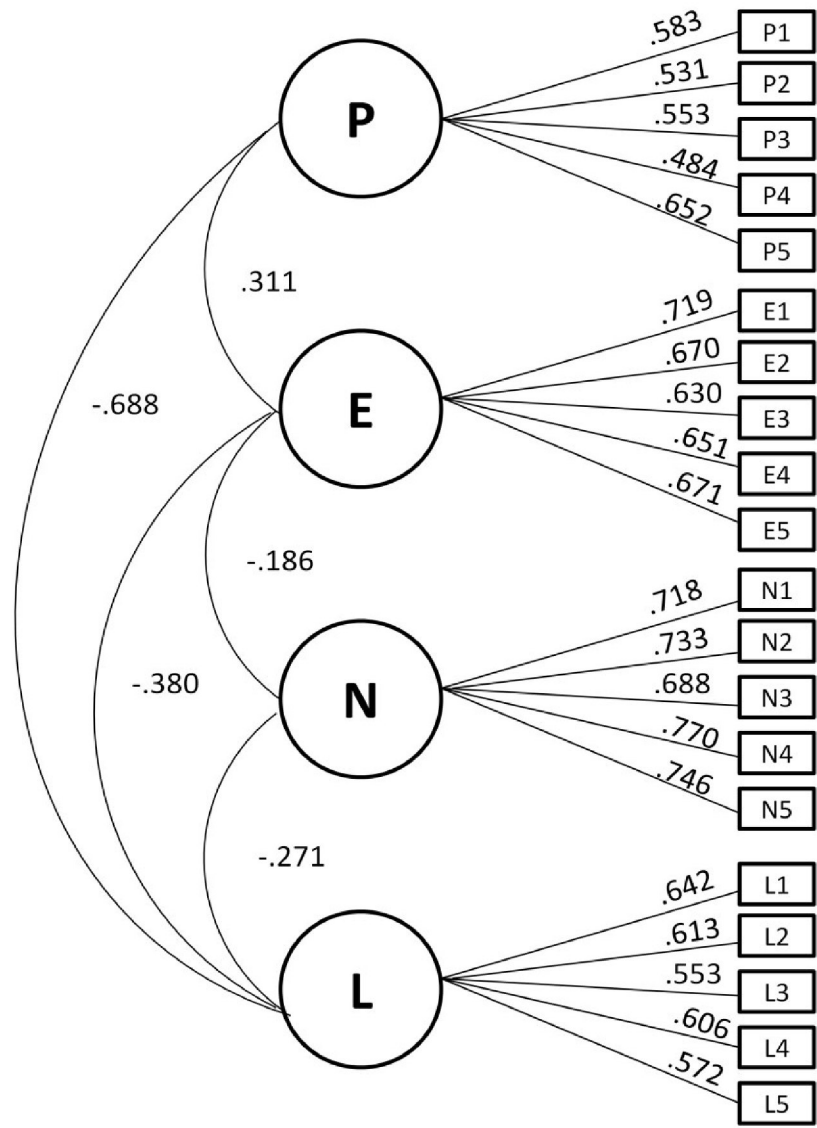


Figure 2: Path diagram, 20 parcels and 4 factors (psychoticism, extraversion, neuroticism, and lie) (MLR estimation method). All loadings are significant ($p \leq .001$). P = psychoticism; E = extraversion; N = neuroticism; L = lie.

5.2.3.2. INVARIANCE

The invariance of the factor structure was tested across genders and two age classes (13-15 and 16-17). The four-factor model, in the first step, was tested on different groups independently and thereafter configural and metric invariance were verified, constraining structure and factor loading to be invariant across group.

Results for invariance tests across gender are shown in Table 4. The model explains the data well on both samples and fit indices indicated that metric invariance is supported ($\Delta\chi^2(16) = 11.389, p \geq .05; \Delta CFI = -.001$). Factor loadings pattern is the same for all groups and does not depend on group membership.

Table 5 shows results for metric invariance tests between age classes. As shown in the table the model fitted the data well on both groups. Configural and metric invariance were also supported ($\Delta\chi^2 (16) = 5.62, p \geq .05; \Delta CFI = -.004$).

Model	Scaling	df	χ^2	<i>p</i>	$\Delta S-B\chi^2$	df	<i>P</i>	CFI	TLI	Δ CFI	RMSEA	<i>p</i>	CI 90%	SRMR
Male	1.125	164	224.515	≤.001				.950	.942		.039	.928	[.025, .051]	.062
Female	.9996	164	248.189	≤.001				.953	.945		.038	.983	[.028, .047]	.054
Configural	1.006	328	472.552	≤.001				.952	.944		.038	.995	[.030, .046]	.057
Metric	1.073	344	483.632	≤.001	11.389	16	.785	.953	.948	-.001	.037	.999	[.029, .044]	.059

Table 4: Invariance Male (*N*=241, Mean age 15.58, *SD* = 1.002) vs Female (*N*=354, Mean age 15.59, *SD* = 1.034).

Model	Scaling	df	χ^2	<i>p</i>	$\Delta S-B\chi^2$	df	<i>P</i>	CFI	TLI	Δ CFI	RMSEA	<i>p</i>	CI 90%	SRMR
13-15 Years	.9934	164	201.99	.023				.972	.968		.031	.990	[.012, .045]	.058
16-17 Years	1.113	164	257.729	≤.001				.948	.939		.040	.968	[.030, .049]	.052
Configural	.9982	328	465.148	≤.001				.957	.950		.037	.997	[.029, .045]	.054
Metric	1.035	344	468.919	≤.001	5.619	16	.992	.961	.956	-.004	.035	1.000	[.027, .043]	.056

Table 5: Age classes Invariance (13-15 years *N* =235, females 138, mean age 14.49, *SD* = .573) (16-17 years *N*=360, males 144, mean age 16.30, *SD* = .459)

5.2.3.3. RELATION WITH OTHER CONSTRUCTS

Validity of the PEN-L scale was assessed in relation to another well known validated questionnaire: BFQ-2. Table 6 shows correlations between JEPQ-R (PEN traits) and BFQ-2 (FFM traits) dimensions (and subdimensions).

	P	E	N
Energy	.193**	.473**	-.203**
Dynamism	.023	.551**	-.294**
Dominance	.289**	.285**	-.072
Agreeableness	-.343**	.136*	.000
Cooperativeness	-.260**	.140*	.026
Politeness	-.359**	.107	-.026
Conscientiousness	-.254**	-.202**	-.122
Scrupulousness	-.311**	-.393**	.073
Perseverance	-.100	.085	-.300**
Emotional Stability	-.137*	.075	-.682**
Emotion Control	.026	.222**	-.746**
Impulse Control	-.280**	-.117	-.390**
Openness	-.183**	.046	-.096
Openness To Culture	-.150*	-.130	-.144*
Openness To Experiences	-.155*	.217**	-.013

Table 6: Correlations between PEN traits and BFQ-2 dimensions and subscales (* $p \leq .05$, ** $p \leq .01$).

Results, as expected, indicated a positive correlation between extraversion (JEPQ-R) and energy (BFQ-2) ($r = .473, p \leq .01$), mostly with its dynamism facet ($r = .551, p \leq .01$), while negative and strong correlations were found between neuroticism and emotional stability ($r = -.682, p \leq .01$), in particular with emotion control subscale ($r = -.746, p \leq .01$). Moreover, according to findings of previous research, psychoticism reported negative, moderate and significant relations with agreeableness ($r = -.343, p \leq .01$),

conscientiousness ($r = -.254, p \leq .01$), and openness ($r = -.183, p \leq .01$). Finally, other unexpected but interesting correlations were found between psychoticism and dominance (facet of energy) ($r = .289, p \leq .01$), and impulse control (facet of emotional stability) ($r = -.280, p \leq .01$); between extraversion and scrupulousness (facet of conscientiousness) ($r = -.393, p \leq .01$); and between neuroticism and dynamism subscale of energy ($r = -.294, p \leq .01$). Globally, coefficients indicate a good convergent validity for PEN scales and results are in line with previous findings based on international samples.

5.3. DISCUSSION

The aim of this work was to verify the metric characteristics and the factor structure of the Junior Eysenck Personality Questionnaire-Revised in the Italian context. To this purpose the questionnaire was translated from English to Italian by the author of this thesis and then back-translated by a native English speaker. The final Italian version was administered to a sample of young people aged between 13 and 17 years, from different Italian regions ($N = 595$). Analyses were conducted in the total sample and separately in four groups (Males / Females and 13-15 / 16-17 years).

Results indicated that scale intercorrelation, Mean, *SD*, kurtosis and skewness were consistent with the values reported for the English version (Corulla, 1990). In the total sample all scales have acceptable skewness and kurtosis distributions, ranging between -1 and +1, even if P scale remains rather leptokurtic and positively skewed. Interesting results were obtained also referring to reliability indices. Alpha coefficients (*KR-20*) for psychoticism, extraversion, neuroticism and Lie were respectively: .68, .78, .83, and .72. All coefficients were satisfactory, even if P scale revealed values slightly lower than those

reported by Corulla (1990) (α ranging between .68 and .82) (but higher than those of the previous English version where α ranged between .43 and .74; Eysenck & Eysenck, 1975). Further analyses about reliability were conducted calculating composite reliability of PEN-L scales, using both WLSMV (dichotomous items) and MLR (parcel) factor loadings. These analyses revealed coefficients higher than α (*KR-20*) and satisfactory for all scales, P included (WLSMV; psychoticism = .87, extraversion = .90, neuroticism = .91, lie = .85) (MLR; psychoticism = .70, extraversion = .80, neuroticism = .85, lie = .74). Reliability, finally, was verified also through test-retest coefficients, on a sub-sample of 67 participants. Analyses revealed satisfactory coefficients for all scales (psychoticism = .83, extraversion = .74, neuroticism = .79, lie = .75) indicating a good temporal stability of the Italian version of the questionnaire. Globally results of reliability analyses are more than satisfactory and in line with previous findings, indicating poorer performances for P scale. The low reliability of this scale has always been a limit in Eysenck's questionnaires and has often been attributed to the multidimensional nature of the construct (psychoticism scale represents several different characteristics such as: hostility, cruelty, lack of empathy and low social conformity) (Eysenck et al., 1985). In this research, however, reliability of P scale was satisfactory for all coefficients considered and, as expected, values were rather higher for model-based internal consistency indices (mostly WLSMV). These results, however, even if new, promising, and therefore, interesting, should be interpreted with caution because, as highlighted by some authors, coefficients derived from WLSMV estimates may tend to be upward-biased (Barbaranelli, Lee, Vellone, & Riegel, 2014; Bentler, 2009; Raykov & Marcoulides 2011). Model-based internal consistency analyses, on the other hand, provide new and interesting information about metric characteristics of JEPQ-R scales and suggest the relevance of carefully analyzing the reliability of P taking into account its complex nature and dichotomous items.

The aim of this study was not only to verify reliability indices of the questionnaire but also to provide evidence about its validity. This objective was achieved analyzing the factor structure of the questionnaire, testing its metric invariance across gender and two age classes (13-15 / 16-17 years old adolescents), and testing the convergent/discriminant validity in relation to another well-known questionnaire such as: BFQ-2 (Big Five Questionnaire-2; Caprara et al., 2007). Results about convergent validity indicated positive relations between PEN-extraversion and BFQ-2-energy, while negative between PEN-neuroticism and BFQ-2-emotion stability. Moreover, coherently with the findings of previous research, PEN-psychoticism was negatively related to three BFQ-2 dimensions: conscientiousness, agreeableness, and openness (e.g., Barbaranelli et al., 2003; Costa & McCrae, 1995; Heaven et al., 2013; Saggino, 2000; Scholte & De Bruyn, 2004). Interestingly, psychoticism reported also a positive relation with the dominance facet of energy, which describes assertiveness and the desire to prevail, and a negative relation with impulse control facet of emotional stability (ability to maintain behavior control). These correlations, however, seem coherent with the Eysenck definition of psychotics as untrusting, hostile, aggressive, lacking in empathy, unhelpful, unemotional and uncontrolled people (Eysenck & Barrett, 2013). Also for extraversion other interesting correlations were found beyond the expected relation with energy (in particular with its dynamism facet: high energy and sociable people). Specifically the Eysenck extraversion was positively related to emotion control (not anxious or emotional people), agreeableness (polite, friendly and cooperative people) and open to experience (people interested in many things), while negatively with scrupulousness (cautious and reflective people). These correlations, on the other hand, are coherent with the Eysenck definition of extraversion. The author, in fact, describes extraverts as sociable, active, and talkative individuals but also as impulsive, easy going, carefree, and not always reliable

people. Finally, also correlations between neuroticism and BFQ-2 scales were consistent with Eysenck's the definition. Specifically, neuroticism was mainly related to the emotion control facet of emotion stability, and further negative correlations were found with dynamism, perseverance (tenacity and capability to keep promises) and openness to culture (openness to different cultures, styles and habits). This pattern of correlations is consistent with the description of neurotics by Eysenck, as worried, moody, nervous, emotional, and tense people, who need to avoid threatening feelings, and can maintain control in their behaviors but have difficulties in controlling mood and emotions.

Validity of the JEPQ-R was studied also testing its factor structure through CFA. The tested model included four factors and twenty indicators (5 parcel each dimension). Findings support the factorial structure of the JEPQ-R also in the Italian context (CFI=.96; TLI= .95; SRMR=.05). Factor loadings were all significant, correlations between latent variables were in the expected directions, and constructs were comparable among genders and age groups. Metric invariance, in fact, was supported in both groups analyzed: Males-Females and 13-15/16-17 years old adolescents. On the other hand, as repeatedly highlighted by previous research, also in this work some difference between genders was detected (e.g., reliability, *SD*, mean) (e.g. Corulla, 1990; Eysenck & Eysenck, 1975; Eysenck et al., 1985). These findings would suggest the usefulness to perform further invariance analyses. Testing higher invariance levels, in fact, could be useful in order to understand the real nature of the well-known differences between males and females allowing at the same time the identification of potential instrument bias. The analysis of higher levels of invariance, on the other hand, should be more useful if performed at item-level. This analysis could be extended also to different age groups. In the present study, in fact, an age range of 13-17 was considered, similar to that of Corulla (1990), although slightly

higher. It could be noted, however, that exploring also lower age classes, as initially made by Eysenck (range 7-17), should be useful.

In summary the findings of the present study provide support for the appropriateness of metric characteristics and factor structure of the questionnaire also in an Italian context. The metric limits of P scale, found in previous versions, are reduced and the four-factor structure was confirmed as well as its metric invariance across age groups and between genders. Finally, it seems important to note that in this research, model-based internal consistency coefficient (Bentler, 2009), usually not applied to PEN-L scales, provided support for reliability of all scales, P included. These promising results, therefore, could be better explored in future research together with more detailed invariance analysis preferably at item-level.

6. CONTRIBUTION TO THE UNDERSTANDING OF MEANING AND FUNCTIONING OF EYSENCK LIE SCALE AMONG ADOLESCENTS

6.1. SOCIAL DESIRABILITY

Researchers and practitioners often use self-report instruments, usually to assess personality and individual differences. However it is well known that these measures can be affected by response sets, styles or bias. The tendency of respondents to provide socially desirable answers, presenting themselves with an overly favorable image, is defined social desirability responding, and represents one of the most studied response bias in social sciences (Paulhus, 2002; Uziel, 2010). Test developers and scholars have addressed the problem by devising social desirability and lying scales, specifically tailored to identify dishonest responding. Over the decades, many different scales have been proposed and their usage has spread, fostering the progressive articulation of the construct (Paulhus, 2002; Uziel, 2010).

There is substantial agreement in identifying two main dimensions at the basis of socially desirable responding. Wiggins (1964) named these two dimensions as gamma and alpha factors, Sackeim and Gur (Gur & Sackeim, 1979; Sackeim & Gur, 1979) used the definitions of other-deception and self-deception while Paulhus preferred the labels of impression management and self-deception (Paulhus, 1984; Paulhus, 2002). The first factor (gamma, or other-deception, or impression management) refers to a conscious responding style aimed to tailor test responses in order to impress an audience. The second dimension (alpha or self-deception) instead refers to an unconscious tendency to see oneself in a favorable light providing positive self-descriptions (Paulhus & John, 1998;

Zerbe & Paulhus, 1987). Furthermore Paulhus and John (1998), more recently, described egoistic and moralistic bias. The first is closer to alpha factor and represents the tendency to attribute to oneself positive qualities such as intellect, status and emotional stability. The second, in contrast, is closer to Gamma factor and is associated with the tendency to deny socially deviant impulses, providing self-description as dutiful and agreeable.

Since the early 1950s many scales have been developed to measure social desirability (Uziel, 2010). To assess the impression management dimension, for example, well-known and used are: the Minnesota Multiphasic Personality Inventory-MMPI-Lie scale (Meehl & Hathaway, 1946), the Eysenck Personality Questionnaires-EPQ Lie scales (Eysenck, & Eysenck, 1964; Eysenck et al., 1985) or the Marlowe-Crowne Social Desirability Scale-MCSDS (Crowne & Marlowe, 1960). The second dimension, instead, is frequently evaluated through: the MMPI-K scale (Hathaway & McKinley, 1951; Meehl & Hathaway, 1946), the Self-Deception Questionnaire (Sackeim & Gur, 1978), or the Self-Deception subscale of the Balanced Inventory of Desirable Responding-BIDR (Paulhus, 1984; Paulhus, 1991). These scales are widely used to correct self-report scores, both in professional and in the scientific fields, however, their validity as dissimulation or fake detectors has been repeatedly questioned (Uziel, 2010).

A methodology frequently used to test the effectiveness of SDSs (social desirability scales) in identifying faking is by comparing self-reports and external criteria, for instance, informant-ratings (Uziel, 2010). It is supposed, in fact, that removing the biasing contribution of SDSs should improve correlation between self and informant-ratings. Results of several researches, however, showed that, in general, correcting for social desirability scores failed to improve accordance with external criteria, and in several cases lowered agreement between self and informant-ratings (e.g., McCrae & Costa, 1983). These findings, therefore, suggested that SDSs, more than a specific responding

style, may be considered as indicators of real individual differences (e.g., Borkenau & Ostendorf, 1992; Pauls & Stemmler, 2003; Uziel, 2014). The trait underlying these scales (beyond their original meaning of dissimulation detector), however, has been differently interpreted by scholars. Some studies, for instance, suggested to focus attention on self-control (Uziel, 2010, 2014) while other authors placed the attention on "need for approval", "social naiveté", "social adjustment" (McCrae & Costa, 1983) or social conformity (Eysenck & Eysenck, 1991).

It is interesting to note that some increasing literature, over the decades, has provided evidence about the relations between SDSs and several constructs or life outcomes. Social desirability, for instance, has been found related to values, *Big Five* and Eysenck traits, organizational behaviors, and interpersonal relations (e.g., Borkenau & Ostendorf, 1992; Borkenau & Zaltauskas, 2009; Buss & Shackelford, 1997; Eysenck & Eysenck, 1975; McCrae & Costa, 1983; Moorman & Podsakoff, 1992; Pauls & Stemmler, 2003; Schwartz, Verkasalo, Antonovsky, & Sagiv 1997; Uziel, 2014; Zerbe & Paulhus, 1987). Moreover interesting and extensive literature has linked social desirability scores to religiosity. SDSs should assess dissimulation tendencies (positively inflated profiles) and the relationship with religiosity appeared rather curious. This relationship received, therefore, much attention and inspired many hypotheses (e.g., Gillings & Joseph, 1996; Lewis, 2000; Pearson & Francis, 1989).

Another relevant issue related to social desirability scales refers to the possibility that these tools might have different interpretations or functioning across different situations. Interestingly, this idea was proposed also by Eysenck (Eysenck & Eysenck, 1991). The author, specifically, argued that Lie scale of the EPQ questionnaires might evaluate dissimulation in competitive or high-demanding situations, while in a non-competitive context it should measure a social conformity trait.

In order to better understand the meaning, functioning, and sensitivity to fake of SDSs, many researches have been produced, and often fake manipulations have been used. In these studies participants are instructed to fake-good or bad in their responses (or to respond honestly), and differences in self-reports are analyzed in order to detect the effect of the different motivations. Results frequently indicated that manipulation affects the mean levels of SDSs, implying that scales are sensitive to faking (e.g. Ferrando & Anguiano-Carrasco, 2009; Paulhus, 2002; Pauls & Crost, 2004; Stöber, 2001; Uziel, 2010). Moreover some researches revealed that correlations between SDSs and other constructs as, for instance, neuroticism can be affected by faking instructions (Jackson & Francis, 1998; Michaelis & Eysenck, 1971). The utility of faking studies, however, has been frequently criticized for the difference between fake experimental situations and real life, and because results seem to highlight variations in SDSs as large as changes in other personality scales (as for instance measures of neuroticism or psychoticism) (Ferrando & Chico, 2001; Uziel, 2010).

Although considerable research has been conducted in this field, using different methodologies and highlighting relevant results, many issues remain open to exploration. The exact meaning and effectiveness of SDSs, for instance, are topics of great interest, needing more research efforts.

6.2. EYSENCK LIE SCALE

The Lie scale of the Eysenck Personality Questionnaire is one of the most famous measures to assess social desirability responding. The scale has been included in the Eysenck questionnaires since the early 1960s (Eysenck & Eysenck, 1964), with the specific aim to measure dissimulation tendencies. Lie scale can be considered a typical measure of impression management, and consists of items which describe a set of issues or behaviors rarely performed but socially desirable, or frequently practiced but socially disapproved (e.g. Have you broken any rules at school? Did you ever take anything (even a pin or button) that belonged to someone else? Do you always say you are sorry when you have been rude? Have you ever said anything bad or nasty about anyone? Do you always wash before a meal? Have you ever cheated at a game? Do you throw waste paper on the floor when there is no waste paper basket handy?).

The scale is well known, used and appreciated in many countries; however, over the years several issues and problematic aspects, common also to other scales for the assessment of social desirability responding, have been raised by many studies. Some research, for example, suggested that the scale could be better represented by a two-dimensional structure (e.g., Francis, Brown, & Pearson, 1991; Francis, 1991). These studies identified two main components, labeled A and B. The items in the first component seem centered on the image of the well-behaved and socially conforming individual, while the component B should be considered as a dissimulation measure (Pearson & Francis, 1989; Francis, 1991). The two-factor structure has however been questioned by other researchers, supporting the original Eysenck formulation (Eysenck & Eysenck, 1975; Ferrando & Anguiano-Carrasco, 2009; Ferrando, Chico, & Lorenzo, 1997; Katz & Francis,

1991; Lajunen & Scherler, 1999; Loo, 1995). Moreover, as reported by Eysenck, the Lie scale had been developed using factor-analytic procedures and, as demonstrated by empirical evidence, the scale has an acceptable degree of internal consistency and satisfactory metric characteristics (Eysenck & Eysenck, 1991). The author, on the other hand, although claiming the unifactorial structure, argued that the scale could have a different meaning or functioning across different situation. Specifically, according to the author, the scale could be useful in detecting dissimulation or fake in competitive situations, while in non-competitive conditions it should be better conceived as the measure of a specific trait, characterized by social conformity or "social naiveté" (Eysenck & Eysenck, 1991). The suggestion that the Lie scale may have different functions or meanings across different faking-motivating conditions, measuring, in some situations, a consistent trait has been explored by several studies. Results, on an overall plain, supported invariance and showed, at the same time, that Lie scales are to some degree sensitive to fake, with scores quite high and relatively stable across different levels of faking conditions (Eysenck, Eysenck, & Shaw, 1974; Michaelis & Eysenck, 1971). Ferrando and Anguiano-Carrasco (2009) in an interesting item-level study provided convincing evidence about the invariance of the Lie scale, under competitive and non-competitive conditions. However, as noted by the authors, their results although suggesting that Lie scale consistently measures a unitary trait are not sufficient to completely understand the exact meaning of the scale. The findings, on the other hand, seem very interesting and therefore further confirmations, in cross-cultural research, would be highly desirable.

Another relevant topic investigated, over the years, is the effectiveness of Lie scale as dissimulation detector. This capability was defended by Eysenck. The author highlighted that important information about faking could be derived not only by the scale score, but also by its relations with neuroticism scale (Eysenck & Eysenck, 1991; Eysenck, et al.,

1974; Jackson & Francis, 1998; Michaelis & Eysenck, 1971). Eysenck showed that in high-demanding conditions the negative relationship between L and N is stronger while it disappears or decreases when faking motivation is low (Eysenck & Eysenck, 1991).

As previously highlighted L scale, over the years, has been subjected to numerous controls and studies, involving both adults and young people. Results, often, indicated that the Lie scale has significant correlations with several constructs, in many contexts, cultures and different groups (e.g., Davis & Claridge, 1998; Knust & Stewart, 2002, Rushton, Fulker, Neale, Nias, & Eysenck, 1989). In particular, well known, discussed and controversial is the relationship with religiosity (e.g., Francis et al., 1989; Gillings & Joseph, 1996; Lewis, 2000; Pearson & Francis, 1989). Religiosity, however, as reported by Eysenck, is not only tied to Lie scale but also to the other PEN traits (Eysenck, 1998; Francis, 1985; Gillings & Joseph, 1996).

Despite the abovementioned concerns Lie scale is still very used and appreciated in clinical and professional settings, therefore further analyses might be useful in order to better investigate all the topics introduced, namely the exact factor structure of the scale and its functioning across different situations, its effectiveness as Lie detector, and its relations with other relevant constructs (religiosity).

6.3. FUNCTIONING OF THE LIE SCALE: STRONG INVARIANCE

Lie scale was devised using factor-analytic procedures and through detailed studies in order to measure a single dimension: social desirability responding (Eysenck & Eysenck, 1991). Over the years, however, its factor structure has been questioned and some authors suggested a two-factor solution. Specifically, the first component was described as a measure of a social conformity trait, while the second was conceived as a measure of dissimulation (Francis, 1991; Francis et al., 1991). Other studies, moreover, although confirming the unidimensional structure, suggested that the scale could have a different meaning or functioning across situations (Eysenck & Eysenck, 1991; Michaelis & Eysenck, 1971). This suggestion was claimed, for instance by Eysenck, the author of Lie scale. As proposed by Eysenck in competitive situations the Lie scale could be useful to identify dissimulation tendencies, while in neutral conditions it should be better conceived as the measure of a social conformity trait. Recent findings, however, provided support to the invariance of the one-factor solution across different motivating instructions (Ferrando & Anguiano-Carrasco, 2009). It is suggested, in other words, that Lie scale should be considered as a consistent trait measure under different conditions.

Even if extensively studied these topics still remain controversial, and more research efforts are needed to better understand the meaning and functioning of the Lie scale. The aim of this study, therefore, was to provide further evidence about these issues, using the junior Italian version of the EPQ-R Lie scale. Specifically the aim of this study was to test the factor structure of the JEPQ-R Lie scale and its invariance across two different conditions: standard/honest instructions vs faking-good instructions. The adequacy of the

one-factor structure was tested through a series of exploratory and confirmatory factor analysis (EFA and CFA), while multiple-group confirmatory factor analysis (MGCFA) was used to assess invariance.

6.3.1. METHOD

6.3.1.1. PARTICIPANTS AND PROCEDURE

Participants were 541 students aged between 13 and 17 years (310 females; mean age 15.56, $SD = 1.003$). Subjects were recruited during school hours and questionnaire completion took place anonymously in their classroom in the presence of teachers and the researcher. All participants completed the questionnaire following standard instructions (the same used in the manual of the EPQ-R adult Italian version; Dazzi, Pedrabissi, & Santinello, 2004), which emphasized the importance of providing honest answers to all questions. After a four-week interval a subsample of 270 subjects completed the questionnaire a second time, but following faking-good instructions. In this last condition participants were asked to answer all test questions presenting themselves as well as possible, regardless of being honest or not (Eysenck et al., 1974). In other words participants were asked to fake-good as if they were competing for a reward or trying to impress someone. During the invariance analysis, participants were divided into two groups: individuals who completed the questionnaire only under standard-instructions were assigned to group 1 ($N=271$; 165 females; mean age 15.65, $SD = 1.046$) while participants who completed the questionnaire also under faking-good instructions were assigned to group 2 ($N=270$; 145 females; mean age 15.46, $SD = .949$). In order to recognize all participants as specific individuals, protecting at the same time their

anonymity, an identification number was provided to each participant. Each subject was assigned to only one of the two groups.

6.3.1.2. INSTRUMENTS

The Junior Eysenck Personality Questionnaire–Revised

The Junior Eysenck Personality Questionnaire–Revised (Corulla, 1990) is an 89-items self-report questionnaire and represents the last refinement of the Eysenck JEPQ (Eysenck & Eysenck, 1975). The questionnaire was developed by Corulla (1990) and comprises four scales: psychoticism (25 items), extraversion (25 items), neuroticism (20 items) and Lie (19 items). The response to each item is dichotomous: yes/no (see chapter 5.).

6.3.1.3. STATISTICAL ANALYSES

In order to evaluate the factor structure of the Lie scale a series of EFA was performed. Specifically, two solutions were tested, respectively with one or two factors. Exploratory factor analyses were performed on the total sample (only honest answers), using Mplus7 (Muthén & Muthén, 2012), and WLSMV as estimator (weighted least squares mean and variance-adjusted) (Muthén & Muthén, 2012). This method is recommended for binary or ordinal observed data (e.g., Brown, 2006; Flora & Curran, 2004) and, therefore, it seemed the best solution to analyze the dichotomously scored items of JEPQ-R. Geomin rotation was used. Geomin is an oblique rotation which provides an estimate of correlations between factors (Browne, 2001; Muthén & Muthén, 2012). The goodness of fit of the models was evaluated using several fit indices: χ^2 , Comparative Fit Index (CFI) (Bentler,

1990), Standardized Root Mean Square Residual (SRMR) (Bentler, 1995), and Root Mean Square Error of Approximation (RMSEA) (Browne & Cudeck, 1993) with its 90% confidence interval (90% CI) and the test of close fit (CFit) (Browne & Cudeck, 1993). Specifically, a solution fits the data well when χ^2 is non-significant ($p \geq .05$), however, this statistic is sensitive to the sample size and, therefore, in the evaluation of models other fit measures were taken into account. Concerning CFI a solution fits the data well if values are above or close to .95 (.90 to .95 for acceptable fit), while RMSEA supports a good fit when values are smaller than .05 (values between .05 and .08 indicate a moderate fit) with the CFit non-significant (Browne & Cudeck, 1993). SRMR indicates a good fit if values are lower than .08 (Hu & Bentler, 1999). To select the best number of factors useful to represent the factor structure of Lie scale, parallel analysis (PA) (Timmerman & Lorenzo-Seva, 2011) was performed using the free software *FACTOR* (Lorenzo-Seva & Ferrando, 2006). Specifically, because Lie scale items are dichotomously scored, PAs have been performed using tetrachoric correlations. Furthermore, in order to achieve detailed results, both MRFA (MRFA minimum rank factor analysis; see, e.g., Shapiro & ten Berge, 2002; ten Berge & Kiers, 1991) and PCA (principal component analysis) extraction methods were used.

After exploratory analysis (on honest total sample, $N=541$) a CFA model was tested (on group 1: standard instruction) and, the invariance of the factor structure across the two group-conditions (standard instructions vs fake-good instructions) was evaluated through MGCFA (Multiple-Group Confirmatory Factor Analysis) as implemented in Mplus 7 (Muthén & Muthén, 2012). Specifically, in the first step the one-factor solution was verified on both groups separately, and afterwards configural and scalar invariance were tested. Because JEPQ-R items are dichotomous, CFA and MGCFA were fitted using WLSMV estimator (weighted least squares mean and variance-adjusted) (Muthén & Muthén,

2012), preferring theta parameterization (Muthén & Asparouhov, 2002). The goodness of fit of the models was evaluated using several indices: chi-square statistic, Root Mean Square Error of Approximation (RMSEA) (Browne & Cudeck, 1993; Steiger & Lind, 1980), Tucker Lewis index (Tucker & Lewis, 1973), Comparative Fit Index (CFI) (Bentler, 1990) and Weighted Root Mean Square Residual (WRMR) (Muthen & Muthen, 2012). A good fit is indicated by WRMR values close to 1.0 (Yu, 2002). To compare nested model Mplus 7 DIFFTEST option (Asparouhov & Muthén, 2006) was used. Invariance was supported if χ^2 DIFFTEST results were non-significant. Furthermore also the Δ CFI index (tests of change in CFI) was considered. A Δ CFI value below or equal to $|\cdot 01|$ suggests the equivalence of model fit (Cheung & Rensvold, 2002). Configural model was fitted allowing factor loadings and thresholds free across groups, residual variances fixed at one in all groups, and factor means fixed at zero in all groups. The metric of factor was set by freeing all factor loadings and fixing the factor variance to one, therefore, factor variance was fixed at one in all groups (Muthén & Muthén, 2013). This model was subsequently compared to a second nested model, where factor loadings and thresholds were constrained to be equal across groups, while residual variances and factor means were fixed respectively at one and zero in one group, and free in the other group (because the metric of a factor was set by fixing the factor variance to one, the factor variance was fixed at one in one group and free in the other group). In the tested model all indicators were binary, therefore, to test invariance, thresholds and loading must be constrained in the same step (scalar or strong invariance). Metric invariance models, in fact, are not identified with binary variables because residual variances (scale factors in delta parameterization) are allowed to vary across groups (Muthén & Muthén, 2013).

6.3.2. RESULTS

6.3.2.1. DESCRIPTIVE STATISTICS AND EXPLORATORY FACTOR ANALYSIS

Descriptive statistics for all PEN-L traits, were computed using SPSS version 17 and results highlighted that under faking conditions answers were, in general, more socially desirable, namely: lower psychoticism and neuroticism, and higher Lie scores. No relevant difference was found between extraversion means across conditions (Table 7).

Group	L		P		E		N	
	STANDARD	FAKE	STANDARD	FAKE	STANDARD	FAKE	STANDARD	FAKE
N	271	270	271	270	271	270	271	270
Mean	7.23	16.72	4.96	2.17	18.48	18.55	12.10	4.27
SD	3.55	3.39	3.10	2.96	4.65	3.76	4.48	3.36
<i>d</i> [CI95%]	2.734	[2.501, 2.970]	-.921	[-1.098, -.743]	.017	[-.152, .185]	-1.98	[-2.182, -1.771]
T-Test	t(539)=-31.819 <i>p</i> ≤.001		t(539)=1.739 <i>p</i> ≤.001		t(539)=-.188 <i>p</i> =.851		t(539)=23.017 <i>p</i> ≤.001	

Table 7: Mean differences between group 1 (standard instruction) and 2 (fake instruction) in the four PEN-L traits. Results of mean, SD, Cohen's d, and t-test.

The factor structure of the JEPQ-R Lie scale was tested through two exploratory factor analyses with respectively one or two factors. Results indicate an acceptable fit for both models (Table 8) (one-factor solution: $\chi^2(152)= 238.637, p \leq .001$; RMSEA = .032 [.024, .040], Cfit = 1.000; CFI = .94; TLI = .93; SRMR=.078) (two-factor solution: $\chi^2(134)= 205.234, p \leq .001$; RMSEA = .031 [.022, .040]; Cfit = 1.000; = .95; TLI = .94; SRMR=.071).

	χ^2	df	p	CFI	TLI	RMSEA	p	CI 90%	SRMR
One-factor solution	238.637	152	≤.001	.938	.930	.032	1.000	[.024, .040]	.078
Two-factor solution	205.234	134	≤.001	.949	.935	.031	.1.000	[.022, .040]	.071

Table 8: Fit indices for exploratory factor analyses. Analyses performed on total sample (N=541; 310 females; mean age 15.56, SD = 1.003)

ITEM	Two-factor solution		One-factor solution
	First factor	Second Factor	
4L	.483*	-.080	.425*
9L	.429*	.080	.474*
13L	.704*	.097	.757*
18L	.390*	.074	.432*
19L	.707*	-.122	.614*
24L	.484*	.174	.588*
31L	.551*	.032	.563*
36L	.516*	-.022	.494*
41L	.775*	-.218	.623*
44L	-.027	.527*	.309*
50L	.295*	.100	.355*
54L	.549*	.061	.580*
58L	.254*	.056	.287*
64L	.222*	.050	.251*
68L	.506*	-.031	.479*
74L	.314	.293	.497*
78L	.213	.038	.234*
80L	.503*	.170	.604*
83L	.021	.790*	.495*

Table 9: Factor loadings for one and two-factor solutions (* significant at 5% level).

Although the χ^2 were significant, the other indices are close to the respective rules of thumb in both models. In the single-factor solution, however, all factor loadings were

significant, while, in the two-factor model some loading were non-significant (correlation between factors was significant and moderate $r=.492$; $p\leq.05$) (Table 9).

On an overall plain, the two-factor solution fits the data better than the one-factor model but, on the other hand, results for the one-factor solution are acceptable and only slightly lower than those of the two-factor model. The opportunity to retain only one factor seems, therefore, supported. This finding, moreover, is supported also by results of PAs. Specifically, all PAs carried out thought the free software FACTOR (Lorenzo-Seva & Ferrando, 2006), suggested to retain only one factor, which explains the 37.27% of common variance (MRFA). Analysis were performed on 500 random correlation matrices, using tetrachoric correlations and, MRFA (minimum rank factor analysis) (MRFA; see, e.g., Shapiro & ten Berge, 2002; ten Berge & Kiers, 1991) and PCA (principal component analysis) extraction methods with Promin rotation (Lorenzo-Seva, 1999).

6.3.2.2. CONFIRMATORY FACTOR ANALYSIS AND INVARIANCE TESTING

In order to test the invariance of the factorial structure of the Lie scale across standard vs faking-good instructions, the one-factor solution was subjected to CFA and MGCFA. Results are showed in Table 10.

The model, in the first stage, was fitted on the two groups separately, providing good indices. Subsequently configural and scalar invariance were verified, constraining structure, and factor loading and threshold to be invariant across groups. The configural model provided an adequate fit and the scalar model also found support, as indicated by: non-significant DIFFTEST and ΔCFI value lower than $|.01|$.

Results, in other words, indicate that Lie scale items measure the same trait in both groups, with the same item-trait relations.

Model	<i>df</i>	χ^2	<i>p</i>	$\Delta\chi^2$	<i>df</i>	<i>p</i>	CFI	TLI	Δ CFI	RMSEA	<i>p</i>	CI 90%	WRMR
Fake Instruction	152	187.604	.026				.983	.981		.033	.976	[.012, .047]	.886
Stand- Instruction	152	193.975	.012				.940	.933		.033	.985	[.016, .046]	.919
Configural	304	379.599	.002				.976	.973		.033	.999	[.021, .043]	1.277
Scalar	321	38.122	.013	12.651	17	.759	.981	.980	-.005	.028	.1000	[.014, .039]	1.315

Table 10: Fit indices for CFA and MGCFA.

6.3.3. DISCUSSION

The aim of this research was to investigate the controversial structure of the Eysenck Personality Questionnaire-Lie scale, using its junior Italian translation. Specifically, analyses were aimed to verify if the factor structure of Lie scale could be better represented by a one or two-factor solution, and if this structure could be considered invariant across two different conditions (fake-good vs standard instruction).

In order to define the factorial structure of the Lie scale a series of EFA and PA were performed. Results suggested the adequacy of the one-factor structure. The more parsimonious solution, in fact, provided acceptable fit indices, only slightly poorer than those of the two-factor solution, and all factor loadings were significant. Moreover, these results have been confirmed by suggestions provided by PA analyses, which advised to retain only one factor, accounting for more than 30 % of the common variance.

The dual nature of the Lie scale, on the other hand, rather than an issue tied to dimensionality might be considered the result of the different functioning of items across different situations (Eysenck & Eysenck, 1991). This suggestion, for instance, was claimed by Eysenck, the author of the Lie scale. Eysenck specifically supported the idea that the Lie scale should represent the measure of a single dimension; but he suggested, at the same time, that this disposition should be conceived as a dissimulation tendency under motivating condition, while as a social conformity trait in non-competitive situations (Eysenck & Eysenck, 1975; Eysenck & Eysenck, 1991; Michaelis & Eysenck, 1971).

In order to verify if meaning and functioning of the Lie scale were consistent across different situations, a series of MGCFA was performed. In particular, these models were aimed to test scalar (or strong) invariance of Lie scale under faking-good vs standard

instructions. Results substantially, provided evidence to support the configural and strong invariance of Lie scale across situations. Results, in other words, indicated that the 19 items of the scale have the same pattern of loadings across the two conditions, measuring the same trait, with the same item-trait relations in both situations. Results of this work, therefore, confirmed that Lie scale should be conceived a single trait measure, as indicated by its author. However, in contrast with Eysenck's suggestions, the results of this study indicated that the unitary trait measured by the scale remain essentially invariant across different faking-motivating conditions. These data, on the other hand, even if in contrast with the suggestion of the author, provide a cross-cultural confirmation for the findings of other similar studies (Ferrando & Anguiano-Carrasco, 2009).

In this work, all analyses were conducted at item-level and using methodologies adequate to handle JEPQ-R dichotomous data. Results, therefore, provide detailed and strong evidence confirming the one-factor structure of the scale and its invariance across two conditions, but no conclusion has been drawn about the exact meaning of the measured construct. This theme, however, is very relevant and therefore will be further investigated in the next studies. Finally, it seems interesting to note that descriptive analyses, in accordance with results of previous studies (Braun & Gomez, 1966; Uziel, 2010; Velicer & Weiner, 1975), suggested that Lie scale is sensitive to fake manipulations. Lie scores, in fact, were higher in faking-good conditions but, on the other hand, also other scales reached more socially desirables scores under faking instructions (lower P and N), indicating therefore, that the sensitivity to fake of Lie scale is analogous to that of other dimensions.

6.4. MEANING OF LIE SCALE: SOCIAL DESIRABILITY BIAS

Lie and social desirability scales (SDSs) are frequently used, and included in the most famous personality questionnaires, as instruments to assess dissimulation. However, many studies questioned their effectiveness as bias detector (Uziel, 2010). Some studies, moreover, highlighted that SDSs are open to several interpretations and could measure not only a response style but also some substance (e.g., McCrae & Costa, 1983; Pauls & Stemmler, 2003). According to some scholars this substance could be characterized as a social acquiescence or “social naiveté” trait; while, other commentators focused their attention on characteristics, such as: “need for approval,” “social adjustment” or self-control (Eysenck & Eysenck, 1991; Massey, 1980; McCrae & Costa, 1983; Uziel, 2014). In this vein, therefore, social desirability scales might not reflect the tendency to dissimulate of some individuals, but rather the honest descriptions of feelings and behaviors of controlled, well-behaved and conformist people. Some evidence supporting this claim has been provided by studies where relevant correlations have been found between SDSs and several constructs, such as: romantic and interpersonal relations, values, FFM and PEN traits, organizational behaviors and religiosity (see for instance: Borkenau & Ostendorf, 1992; Eysenck & Eysenck, 1975; Gillings & Joseph, 1996; Harker & Keltner, 2001; Hunsley, Vito, Pinsent, James, & Lefebvre, 1996; Jackson & Francis, 1998; Moorman & Podsakoff, 1992; Pearson & Francis, 1989; Schwartz et al., 1997; Uziel, 2014; Zerbe & Paulhus, 1987). Furthermore an extensive literature highlighted that correcting questionnaire scores relying on SDSs indications, is a questionable practice, since adjusting scores for social desirability does not improve the validity of self-assessments if compared with other external criteria (e.g., Borkenau & Ostendorf, 1992; Kurtz, Tarquini,

& Iobst, 2008; McCrae & Costa, 1983). In order to test the effect of social desirability scale scores between self-assessment and other criteria, many studies performed a series of analyses comparing self and informant-reports of personality (e.g., McCrae & Costa, 1983; Pauls & Stemmler, 2003; Uziel, 2014). Informant-reports are conceived as external criteria less biased than self-report and, therefore, it is supposed that the variance shared between self and informant-ratings would represent the real trait variance. The self-informant relation, consequently, should increase after removing or partialling out the contribution of SDSs score. Research, however, demonstrated that removing the effect of SDSs from self/informant relation, in general, does not improve agreement but, on the contrary, lowers correlations. This result, for instance, has been found in a relevant study of McCrae and Costa (1983), where authors found reduced correlations between self and informant-ratings (spouse ratings) after removing SDSs contribution, as assessed by two well-known scales: the Marlowe-Crowne social desirability scale (Crowne & Marlowe, 1964), and the Lie scale Form A of the Eysenck Personality Inventory (EPI; Eysenck & Eysenck, 1964). In this study, moreover, authors found that both SDSs were related to neuroticism (and lesser to extraversion and closedness). Analogous results were found by Pauls and Stemmler (2003) who, in addition, verified also correlations between SDSs and the bias indices of the *Big Five* traits, calculated as suggested by Paulhus and John (1998). Specifically, Paulhus and John (1998) suggested that residual variance, after regressing self-reports on observer-ratings, could represent the self-report inflation, because all the variance shared by informant and self-report is removed. Using this technique Pauls and Stemmler (2003) found positive and significant correlations only between impression management (facet of social desirability) and the bias scores of agreeableness and conscientiousness (self-deceptive enhancement facet of social desirability was positively correlated with bias scores of emotional stability, extraversion,

and openness). Interestingly other studies found also relations between SDSs and conscientiousness or other traits such as neuroticism or psychoticism (Eysenck & Eysenck, 1975; Jackson & Francis, 1998; Michaelis & Eysenck, 1971). Specifically, as suggested by Eysenck's studies, correlations between social desirability measures and EPI scales, have consistently shown that neuroticism (N) and psychoticism (P) dimensions are negatively tied to Lie scores (Eysenck et al., 1985; Eysenck & Eysenck, 1991). Eysenck, furthermore, showed that in high-demanding conditions the negative relationship between L and N is stronger, while it disappears or decreases when faking motivation is low (Eysenck & Eysenck, 1991). Moreover it should be noted that the negative relation between Lie scales and psychoticism seems consistent with the positive correlation found, in other studies, with conscientiousness (Smith & Ellingson, 2002; Ones, Viswesvaran, & Reiss, 1996). Psychoticism and conscientiousness, in fact, as suggested by several findings, are opposed but strongly tied: the first describes hostility and the tendency to antisocial behaviors, while, the second describes purposeful, controlled, and reliable people (e.g., Barbaranelli et al., 2003; Costa & McCrae, 1995; Heaven et al., 2013; Saggino, 2000).

Despite the great amount of evidence produced in order to better understand the meaning and effectiveness of Lie scales, these topics still remain widely debated, and further analyses are strongly encouraged. In particular, it seems important to better define the role of SDSs; understanding whether their meaning should be referred only to a bias index or also to some real trait variance. The aim of this study, therefore, is to provide a new contribution on this topic by analyzing the effectiveness as bias detector of the Italian version of the Lie scale of the abbreviated version of the Junior Eysenck Personality Questionnaire Revised (JEPQR-A; Francis, 1996), which represents an impression management measure. The bias-detector role of the JEPQR-A Lie scale in the

assessment of personality was analyzed by comparing self and informant-reports (classmate). Specifically it was expected that the relations between Lie scale scores and the tendency to dissimulate of certain subjects would be weak or non-significant, since it was expected that the scale should reveal to measure some true substance and not only a style. It was expected, in other words, that Lie scale would not correlate with the bias indices of PEN traits, calculated using the Paulhus and John method (Paulhus & John, 1998). Furthermore it was hypothesized that the scale would have a little or non-significant moderating effect in the relation between self and informant reports but it was expected, that the self-informant relation may slightly lower partialling out the contribution of Lie scale, indicating that the scale measures not only style but also some true variance. Finally, it was expected that the agreement between self and informant-reports in personality and Lie scale should be relatively high, indicating that the answers provided by subjects reflect honest self-descriptions, rather than the intention to dissimulate or provide positively inflated profiles.

6.4.1. METHOD

6.4.1.1. PARTICIPANTS AND PROCEDURE

Participants were 325 students, aged between 13 and 17 (141 male; mean age 15.47, $SD = .96$). They were recruited during school hours and completed questionnaires anonymously in their classrooms. Individual numbers were (anonymously) allocated to participants. All subjects completed the questionnaire twice; the second administration took place after a four-week interval. In the first completion participants were asked to

answer honestly and quickly all questions, as in standard instructions, while in the second administration subjects were required to rate their classmate.

6.4.1.2. INSTRUMENTS

Lie scale and PEN traits were assessed using the JEPQR-A questionnaire (Junior Eysenck Personality Questionnaire Revised-Abbreviated) (Francis, 1996). This instrument is the shortest version of questionnaires, founded in the Eysenck theory, for the assessment of the four PEN-L traits. Each scale is measured by six items, dichotomously scored (yes-no). According to the author, even though lower reliability coefficients than in the longer versions have been obtained, the reliability and validity of JEPQR-A can be recommended as a functional equivalent of longer versions. Specifically the alpha coefficients recorded by the JEPQR-A scales were: .61, .66, .70 and .57 for the scales psychoticism, extraversion, neuroticism, and Lie, respectively; surprisingly high coefficients for scales with six items only. The validity of the JEPQR-A was assessed in relation to the JEPQR-S scores and coefficients for extraversion, neuroticism, psychoticism and Lie scales were respectively: .91, .92, .88, .89. Lie scale scores reported significant negative correlations with E ($r=-.15$) and with P ($r=-.33$), but were not significantly correlated with N; Maltby and Talley (1998) reported significant negative relations with P only. The questionnaire is frequently used in several contexts and some translations have been validated (Scholte & De Bruyn, 2001), however an Italian version is not available. In the first step of this research, therefore, the questionnaire was translated from English to Italian by the author of this thesis and then back-translated by a native English speaker. Finally, psychometric characteristics of the translated version were evaluated.

6.4.1.3. STATISTICAL ANALYSES

6.4.1.3.1. JEPQR-A analyses

The psychometric characteristics of the Italian translation of the JEPQR-A questionnaire (Francis, 1996) were evaluated. Reliability coefficients were calculated using SPSS version 17, while factor structure was tested through confirmatory factory analysis. Specifically, the four-factor structure was tested using item as indicators and WLSMV as estimator (weighted least squares mean and variance-adjusted) (Muthén & Muthén, 2012) (Mplus 7; Muthén & Muthén, 2012). This method has been recommended for models involving categorical observed data (e.g., binary or ordinal), as JEPQR-A items (e.g., Brown, 2006; Flora & Curran, 2004). Several goodness-of-fit indices were evaluated: chi-square, Comparative Fit Index (CFI) (Bentler, 1990), Weighted Root Mean Square Residual (WRMR) (Muthen & Muthen, 2012), and Root Mean Square Error of Approximation (RMSEA) (Browne & Cudeck, 1993; Steiger & Lind, 1980) with its 90% confidence interval (90% CI) and the test of close fit (CFit) (Browne & Cudeck, 1993). Concerning the first index, a solution fits the data well when χ^2 is non-significant ($p \geq .05$), however, this statistic is sensitive to the sample size and therefore the other fit indices were also evaluated. A good fit is indicated by WRMR values close to 1.0 (Yu, 2002); CFI values above or close to .95 (.90 to .95 for acceptable fit) (e.g. Bentler, 1990) and RMSEA values smaller than .08 with CFit non-significant (Browne & Cudeck, 1993).

6.4.1.3.2. *Self-informant report analyses*

Descriptive statistics, scale intercorrelations, correlations between self and informant-reports, and partial correlation (where the contribution of Lie scale was partialled out from the relation between self-informant reports) were calculated using SPSS version 17. The moderation effect of Lie scale between self and informant reports (interaction effects of Lie scale and self-reports, on informant-ratings), for each PEN scale, was evaluated through regressions analyses, as in PROCESS macros for SPSS (Hayes, 2012). Finally, for each PEN trait a bias index was calculated using Paulhus and John's method (Paulhus & John, 1998). Specifically, self-report assessments were regressed on informant-reports and residuals were conceived as bias index. These bias indices were correlated with Lie scale scores, in order to verify the effectiveness of Lie scale as bias detector.

6.4.2. RESULTS

6.4.2.1. JEPQR-A

Reliability coefficients α for the Italian version of the JEPQ-R were calculated using SPSS version 17, and results for PEN-L scales were respectively: .58, .73, .71 and .50. These results are consistent with coefficients reported for the original version and other translations of the questionnaire (P ranging from .47 to .64, E ranging from .59 to .73, N ranging from .68 to .76, and L ranging from .54 to .68) (Francis, 1996; Maltby & Talley, 1998; Scholte & De Bruyn, 2001) and seem acceptable for scales with six items only. Scale intercorrelations are shown in Table 11. Lie scale reported significant negative

correlations with E ($r = -.135, p \leq .05$) and with P ($r = -.250, p \leq .01$), but was not significantly correlated with N, as in the original English version (Francis, 1996).

	P	E	N	L
P	1			
E	,143*	1		
N	-,124*	-,176**	1	
L	-,250**	-,135*	-,082	1

Table 11: Scale Intercorrelations (* $p \leq .05$, ** $p \leq .01$).

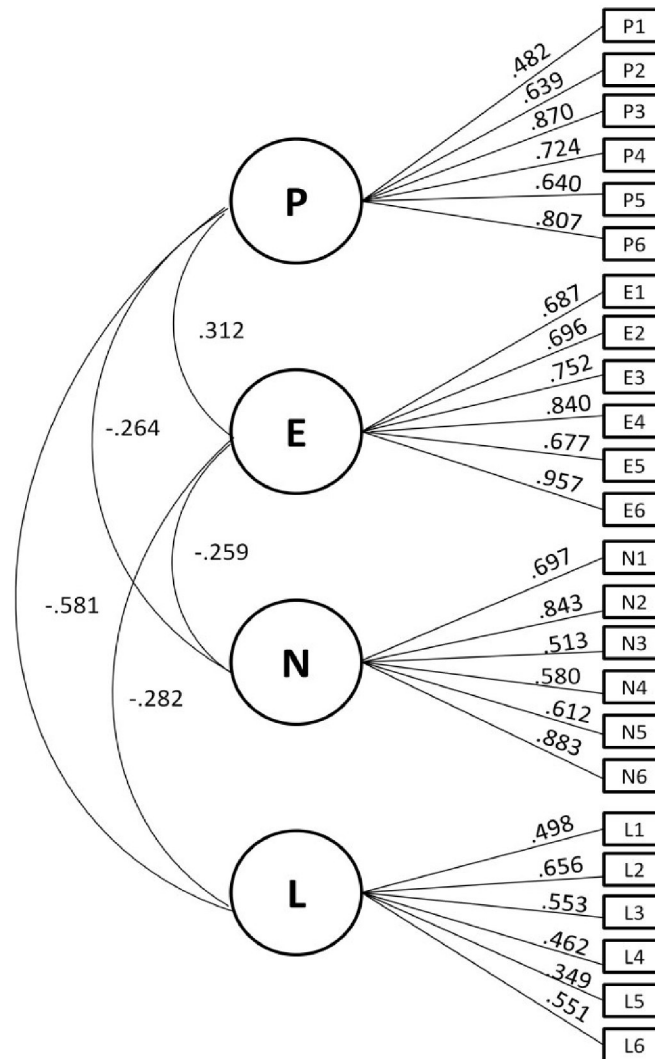


Figure 3: Factor structure of JEPQR-A. All parameters are significant $p \leq .001$ (Excluding correlations N-P, $p = .003$; L-E, $p = .002$) ($N = 325$).

The four-factor structure was confirmed through CFA, with WLSMV as estimator (weighted least squares mean and variance-adjusted), as implemented in Mplus 7 (Muthén & Muthén, 2012), and results are represented in Figure 3. Although the χ^2 was significant, the other indices were satisfactory ($\chi^2(246) = 344.323$, $p \leq .001$; CFI = .93; RMSEA = .035 [.026, .044], Cfit = .999; WRMR = 1.099) and all factor loadings were significant ($p \leq .001$).

6.4.2.2. SELF- INFORMANT REPORT ANALYSES

6.4.2.2.1. Correlations

Zero-order correlations and partial-correlations (L scale contribution partialled out) between self and informant-report are reported in Table 12. All correlations are positive, significant and moderate. Partialling out the contribution of Lie scale, in general, no effect could be detected. Zero-order and partial coefficients are very close for each scale, with correlations slightly lower after partialling out the contribution of Lie scale (only for N scale coefficient is slightly higher after removing the contribution of Lie scale).

	Self-Informant	Partial correlation
P	.442	.421
E	.448	.434
N	.320	.325
L	.276	

Table 12: Zero-order correlations and partial correlations (L scale partialled out) between self and informant report. All coefficients are significant ($p \leq .01$).

6.4.2.2.2. *Moderation*

The moderator effect of Lie scale between self and informant-report was tested through regression analyses and results are reported in Table 13.

For each PEN trait, self-report score, Lie scale score, and their interaction were used as predictors of the relative informant-rating score. As shown in the table no interaction term is significant, indicating that no moderation effect of Lie scale between self and informant-report is supported.

	Coeff.	SE	t	p	95 CI%	
					LLCI	ULCI
L	-.044	.046	-.964	.336	-.134	.046
P	.615	.081	7.599	.000	.455	.774
Int PxL	.021	.056	.386	.700	-.088	.131
L	-.135	.059	-2.287	.023	-.250	-.019
E	.446	.051	8.713	.000	.346	.547
Int ExL	-.044	.037	-1.184	.237	-.117	.029
L	.090	.066	1.358	.176	-.040	.219
N	.295	.048	6.152	.000	.201	.390
Int NxL	.020	.033	.585	.559	-.046	.085

Table 13: Coefficients for moderation analyses. Lie scale score, self-report score and their interaction are predictors of informant rating scores, for each PEN trait.

6.4.2.2.3. *Bias index*

A bias index was computed, for each PEN scale, as residual variance after regressing self on informant-score. This index represents the self-report inflation, because all the variance shared by informant and self-reports is removed. High residuals, therefore, indicate high self-favoring bias. The bias index for each PEN trait was correlated with Lie

scale and results are reported in Table 14. Table 14 reports also descriptive statistics for self and informant-reports for each PEN trait and their mean difference.

As shown in the table, for P scale, self-report mean was more socially desirable than the relative informant rating, while informant-reports were the more positive for N and L dimensions (lower N and higher Lie in informant-reports). For E means of self and informant-reports were very close. Correlations between bias indices and Lie scale were non-significant for E and N dimensions, while negative and significant for P.

	Self-Report		Informant-Report		Mean Difference (self-informant)						Correlation Lie - bias index		
	Mean	SD	Mean	SD	Mean	SD	SE	Lower	Upper	t	df	p	r
P	.428	.853	.874	1.191	-.446	1.117	.062	.324	.568	7.200	324	.00	-.201**
E	4.618	1.574	4.726	1.582	-.108	1.659	.092	-.073	.289	1.171	324	.24	-.066
N	3.237	1.831	2.397	1.661	.840	2.041	.113	-1.063	-.617	-7.420	324	.00	-.101
L	2.372	1.345	2.603	1.765	-.231	1.902	.105	.023	.438	2.188	324	.03	

Table 14: Mean differences (paired-samples t-test) between self and informant-report for each PEN-L trait, and correlation between bias index and Lie scale for PEN traits ($p \leq .01$).**

6.4.3. DISCUSSION

The aim of this study was to test the effectiveness as bias-detector of the JEPQR-A Lie scale in the assessment of personality. To achieve this objective personality self and informant-reports (classmate) were collected in a large sample of adolescents ($N=325$, mean age 15.47, $SD = .96$), using the Italian translation of the abbreviated version of the Junior Eysenck Personality Questionnaire Revised (JEPQR-A; Francis, 1996). According to the author (Francis, 1996) the reliability and validity of the English version of the JEPQR-A can be recommended as a functional equivalent of longer versions, however an Italian version of the questionnaire is not available. In the first step of this study, therefore, reliability and factor structure of the Italian translation were verified. Results supported the four-factor structure, and reliability α coefficients for all PEN-L scales were respectively: .58, .73, .71 and .50. These coefficients are consistent with values found in the original English version of the questionnaire (and in other studies concerning the questionnaire) (P ranging from .47 to .64, E ranging from .59 to .73, N ranging from .68 to .76, and L ranging from .54 to .68) (Francis, 1996; Maltby & Talley, 1998; Scholte & De Bruyn, 2001) and seem acceptable for scales with six items only.

To test the meaning of the JEPQR-A Lie scale in the assessment of personality, correlations between self and informant-reports were calculated for each PEN-L scale. Results, in general, reported for all dimensions positive, significant ($p \leq .01$), and moderate (ranging from .28 for E to .45 for L) coefficients. Means of self-informant ratings suggested that, on an overall plain, subjects described themselves as less tough-minded (psychotics) but more neurotic, than they were rated by their classmates. Furthermore Lie scores were also more socially desirable (high L) in informant-reports. These results seem to suggest

that participants answered honestly to all scales, Lie included since correlations are moderate and significant for all dimensions, and only for P scale subjects rated themselves as more socially desirable than they were rated by classmates. It should be noted, on the other hand, that some bias in answers could be detected, because for three scales (P, N and L) self-informant means are different.

To better understand if Lie scale measures only style or also some true substance, correlations between self and informant-reports were computed for each PEN trait also partialling out the contribution of self-report Lie scores. Results revealed that correlation coefficients, after removing L score's contribution, remain significant, and very close to zero-order correlations, even if slightly lower for P and E (slightly higher for N). Informant-reports are conceived as external criteria less biased than self-reports and, therefore, it is supposed that the variance shared between self and informant-ratings would represent the real trait variance. The self-informant relation, therefore, should increase when the Lie "biasing" contribution is partialled out. Results of this study, however, seem to suggest that Lie scale measures not only bias because after controlling for L, correlations remain stable (slightly decrease for P and E). This finding was supported also by moderation analyses. Specifically, results indicated that, for all PEN traits, any moderator effect in the relation between self and informant reports is related to Lie scale.

Finally, the effectiveness of Lie scale as bias-detector was verified also analyzing correlations between Lie scores and the bias indices of PEN traits, which were calculated as residuals after regressing self on informant-reports. It was, specifically, expected that Lie scale would have reported non-significant correlations with PEN bias indices. This expectation, however, was met only for E and N, while the correlation of P-bias with Lie scores was significant but negative. This pattern of data suggests that Lie scale scores are

not related to dissimulation tendencies in E and N, and indicates also that the higher Lie scores the smaller is the bias of P. This result, in other words, places some skepticism on the effectiveness of Lie scale in detecting bias. Moreover, the unexpected finding of a significant and negative relation between Lie scores and P-bias, seems even more challenging. This relation, in fact, indicates that the more people describe themselves honestly on P scale, the higher is their Lie score (high dissimulation tendency). This result apparently inconsistent, however, might be meaningfully interpreted considering Lie scale as a social conformity measure. In other words, it could be tentatively suggested that the more people are “well-behaved” and conformist (high lie) the smaller the dissimulation tendency they show about psychoticism and related behaviors, for instance: coldness, rudeness, cruelty, unreliability (and lying paradoxically!).

In summary, in this study the effectiveness of JEPQR-A Lie scale is questioned, and it is suggested that the scale should be better conceived as the measure of some true variance (related to a social conformity trait), rather than as a style index. This suggestion was supported by results of correlation analyses, where, for PEN trait, no self-informant agreement-coefficient increased after partialling out the contribution of L scale (only N slightly increased). This data was, moreover, confirmed by moderation analyses and by correlations between PEN-bias indices and Lie scale. These last analyses, specifically, seem to suggest that Lie scale could be conceived as a social conformity disposition negatively related to the discrepancy between self-informant agreements on P dimension. The findings of this study seem interesting; however, more research efforts are needed to better understand the actual meaning and functioning of Lie scale, maybe analyzing correlation of the scale with other constructs. Moreover, it should be noted that, even if promising, the results of this study rely on JEPQR-A scores only. Psychometric characteristics of the Italian translation of this questionnaire were evaluated in the first

step of this study and results for all scales revealed indices consistent with the original English version. It should, however, be taken into account that each scale contains six items only. Further confirmations of results are, therefore, strongly recommended using more reliable and longer versions of the instrument.

6.5. PERSONALITY, LIE SCALE, SOCIAL DESIRABILITY BIAS, SOCIAL CONFORMITY, AND RELIGIOSITY

Over the years an interesting debate has grown around the links found by many studies between religiosity and social desirability scale scores (e.g., Francis et al., 1989; Gillings & Joseph, 1996; Lewis, 2000; Pearson & Francis, 1989). Lie scale was included in the Eysenck questionnaires, in order to measure the tendency to deceive or fake-good of certain subjects (Eysenck & Eysenck, 1964; Eysenck & Eysenck, 1975) and, therefore, the links with religiosity appeared rather curious. Many hypotheses have been proposed. Crandall and Gozali (1969), for instance, suggested placing attention on denial or repression defense mechanisms, while other scholars focused on immaturity and “lack of insight” (Eysenck et al., 1971), or on social conformity and acquiescence dispositions (Eysenck & Eysenck, 1991, Massey, 1980; Nias, 1973). This last position, proposed for instance by Eysenck (the author of Lie scale), seems particularly interesting. Eysenck, in fact, suggested that Lie scale could be useful in detecting dissimulation under competitive conditions, but he suggested also that in non-competitive situations the scale should be better conceived as the measure of a social conformity or “naiveté” trait (Eysenck & Eysenck, 1975). In this vein, the link between religiosity and Lie scale scores could be conceived as the tendency of conformist individuals to embrace religious behaviors, rather than as the tendency of religious people to be dissimulators. This suggestion, in particular, was explored by Nias (1973; Brown, 1985). The author, specifically, proposed that the links between religiosity and high Lie scores, found among young people, could be explained referring to the tendency of conformist adolescents to internalize parents’ values. The links between values and religion are well known in literature and recent

studies highlighted, moreover, that both values and traits have relevant relations with religiosity (e.g., Roccas 2005; Saroglou, Delpierre, & Dernelle, 2004; Schwartz & Huismans, 1995). These two sets of dispositions even though conceptually distinct are often empirically related and over the years, numerous and important researches have shown that traits and values contribute together in several subjective experiences, through complex dynamics (e.g., Caprara, Alessandri, & Eisenberg, 2012; Haslam, Whelan, & Bastian, 2009; Olver & Mooradian, 2003; Saroglou & Munoz-Garcia, 2008).

The relation between religiosity and Lie scale has been widely debated and its relevance might be attributed, at least partially, to the contribution that it could provide to understanding the meaning of the scale. It should be noted, however, that great interest has been devoted not only to this scale but also to the relations between religiosity and all PEN traits (e.g., Eysenck, 1998; Maltby, 1998). Several studies, in fact, identified in different cultures and religions, significant relations between religiosity and low psychoticism (and high Lie scale scores) (e.g., Gillings & Joseph, 1996; Wilde & Joseph, 1997). Less univocal, on the contrary, are relationships between religiosity and the other two traits: neuroticism and extraversion. Some studies, for instance, showed low or non-significant correlations between these dimensions, while others suggested that introverts tend to be more religious (e.g., Francis, 1985; Francis & Katz, 1992). The aim of this study, therefore, is to better explore relationships between religiosity and the four dimensions measured by JEPQ-R, contributing at the same time to the understanding of the meaning of the Lie scale. In particular, the objective of this study is to explore the effects of PEN-L traits on religiosity (considering three facets of the construct, namely: intrinsic religiosity, extrinsic religiosity and quest orientation), taking into account the contribution of personal values of the Schwartz model (Schwartz et al., 2001). To this purpose a structural equation model was tested and some hypotheses were articulated:

1) The relationship between religiosity and Lie scale scores is due to the meaning of the scale. Specifically, it is hypothesized that the scale could measure not only dissimulation tendencies but also a consistent disposition tied to social conformity. Lie scale consequently, reflecting a social conformity disposition, should foster the choice for conservatism-related values, which in turn should have an effect on religiosity. In other words, it is expected that the well-known relationship between Lie scale and religiosity would be mediated by values.

2) It is hypothesized, moreover, that values should have a mediation role also in the relations between the other PEN traits and religiosity (intrinsic, extrinsic, and quest).

This study intends to provide a contribution to understanding the meaning of the Lie scale, exploring at the same time, the role of trait and values in religious experience. To this purpose, it was decided to use structural equation modeling. This methodology seemed highly suitable because many variables can be included in the same model and every effect can be accurately analyzed, adding new contributions to previous correlational findings.

6.5.1. METHOD

6.5.1.1. PARTICIPANTS AND PROCEDURE

Participants were 370 adolescents aged between 13 and 17 (236 female; mean age 15.43; $SD = 1.012$). Subjects were recruited during school hours and completed a battery of questionnaires: JEPQ-R (Junior Eysenck Personality Questionnaire-Revised; Corulla, 1990), PVQ (Portrait Value Questionnaire; Schwartz et al., 2001) and RLOS (Religious Life and Orientation Scale; Voci, 2015). Questionnaire completion took place during school

hours, in the classroom and in the presence of teachers and the researcher. Questionnaires were completed anonymously and only three personal details were required: mother tongue, age and gender.

6.5.1.2. INSTRUMENTS

6.5.1.2.1. Junior Eysenck Personality Questionnaire-Revised (JEPQ-R)

The Junior Eysenck Personality Questionnaire-Revised (Corulla, 1990) is a 89-items self-report questionnaire used to assess, among young people, three personality dimensions: psychoticism (25 items), extraversion (25 items), and neuroticism (20 items). The questionnaire includes also a Lie scale (19 items), devised to detect deception and socially desirable responding. The response to each item is dichotomous: yes/no. The Junior Eysenck Personality Questionnaire-Revised was developed by Corulla (1990) and represents the last refinement of the Eysenck JEPQ (Eysenck & Eysenck, 1975). As reported by Corulla (1990), after his scale revision, the three main psychometric limitations suffered by previous versions were considerably reduced (see see chapter 5.).

6.5.1.2.2. Portrait Values Questionnaire (PVQ)

The PVQ is a questionnaire, based on the Schwartz's values theory (Schwartz et al., 2001). It measures 10 distinct universal values (power, achievement, stimulation, hedonism, self-direction, universalism, benevolence, tradition, conformity, and security) through 40 items on a six-point scale, ranging from "very much like me" to "not like me at all". The 10 values are organized in a circumplex model and grouped into four high-order factors: openness to change, conservatism, self-transcendence, and self-enhancement

(Schwartz, 2005). Studies in many different countries supported the reliability of the instrument as well as its convergent and discriminant validity (Schwartz, 2005; Schwartz et al., 2001). In the present study the Italian version of the scale was used (Capanna, Vecchione, & Schwartz, 2005; see also, Di Nuovo, Hichy, & Pirrone, 2011). The internal consistency coefficients ranged from .60 to .83; and confirmatory factor analysis (CFA) supported the original values organization and higher-order structure (see also, Vecchione, Casconi, & Barbaranelli, 2009).

6.5.1.2.3. Religious Life and Orientation Scale (RLOS)

The questionnaire is a short and reliable measure of three religiosity facets: religion as end (intrinsic), religion as means (extrinsic), and religion as quest.

Intrinsic orientation represents an internalized and mature expression of religiosity, characterized by a profound and sincere reflection on spiritual questions (Allport, 1950) (e.g., I have found it is essential to have faith; My religious beliefs are what really lie behind my whole approach to life). Extrinsic religiosity, in contrast, represents a less profound facet of religion and is characterized by an utilitarian approach to spiritual issues (e.g., A primary reason for my interest in religion is that my church is a congenial social activity; One reason for my being a church member is that such membership helps to establish a person in the community). In other words, in the intrinsic approach religion is seen as an “end” in itself, while in the extrinsic facet, religion is conceived as a mean that people “use” to satisfy other needs. The “quest” scale, finally, refers to a less conventional aspect of religiosity, which considers religion as an open-end, characterized by a responsive, critical, and meditative approach to existential questions (e.g., For me, doubting is an important part of what it means to be religious; It might be said that I value my religious doubts and uncertainties).

RLOS questionnaire, is based on pre-existing items (Religious Orientation Scale-ROS; Allport & Ross, 1967) (Religious Life Inventory-RLI; Batson, Schoenrade & Ventis, 1993), but has been developed and tested in the Italian context, providing adequate metric characteristic. The internal consistency coefficients ranged from .72 to .84 and CFA supported the three-factor structure (α intrinsic = .84; α extrinsic = .72; α quest = .72). The questionnaire comprises 18 items on a seven-point scale ranging from “it describes me very well” to “it does not describe me at all”.

Table 16 summarizes reliability indices and number of items for each scale used in the study.

Scale	α	item
Psychoticism	.70	25
Extraversion	.78	25
Neuroticism	.83	20
Lie	.70	19
Intrinsic Religiosity	.88	8
Extrinsic Religiosity	.78	5
Religion-as-Quest	.69	5
Openness to change	.81	10
Self-transcendence	.81	10
Self-enhancement	.83	7
Conservatism	.80	13

Table 15: Reliability coefficients and number of items for the scales used.

6.5.1.3. STATISTICAL ANALYSES

In order to verify the research hypotheses a structural equation model was tested. In the model the independent variables were the three personality traits assessed by the JEPQ-R (Corulla, 1990), namely: psychoticism, extraversion, and neuroticism. Furthermore in the model also Lie scale was included as independent variable. It was, in fact, supposed that the scale should be conceived as the measure of a social conformity disposition (rather than a dissimulation detector). In the model the criterion variables were the three religiosity facets assessed by RLOS scale (Voci, 2015): intrinsic orientation, extrinsic orientation and “quest” religiosity. Moreover, four mediator variables were included: openness to change, self-transcendence, self-enhancement, and conservatism values (Schwartz et al., 2001). Mediator variables, in other words, were the four higher-order factors of the Schwartz model of values (Schwartz, 2005).

In order to capture with simplicity and clarity the underlying meaning of the model (even analyzing the role of many variables) a total aggregation strategy was chosen (Bagozzi & Edwards, 1998; Bagozzi & Heatherton, 1994; Baumgartner & Homburg, 1996). All variables, consequently, had a single-indicator represented by the sum of all items in the relative scale, and the error variance for each single-indicator was fixed at one minus the sample reliability estimate of the variable, multiplied by its sample variance (Bollen, 1989; Stephenson & Holbert, 2003). Using this technique unique variance is not estimated as part of the model but unreliability of measurement is taken into account. Resulting parameters, therefore, should be less biased than in path analysis, where unique variance is assumed to be zero (Coffman & MacCallum, 2005; Stephenson & Holbert, 2003). Initially a saturated model was tested, and subsequently non-significant parameters were removed in order to obtain the final model. All effects (total, direct, indirect and specific)

were verified using the bootstrap confidence interval (5000 bootstrap samples), and the indirect effect test, as implemented in Mplus 7 (Muthén & Muthén, 2012). Analyses were performed using Maximum Likelihood Robust MLR-estimator. MLR has been shown to be the most accurate estimator when the distribution of scores deviates from a normal distribution and is an extension of MLM that can include missing data (Brown, 2006; Muthén & Muthén, 2012; Yuan & Bentler, 2000). A variety of indices were used to evaluate the fit of the model: chi-square statistic, Standardized Root Mean Square Residual (SRMR) (Bentler, 1995), Comparative Fit Index (CFI; Bentler, 1990), and Root Mean Square Error of Approximation (RMSEA) (Steiger & Lind, 1980; Browne & Cudeck, 1993) with its 90% confidence interval (90% CI) and test of close fit (CFit) (Browne & Cudeck, 1993). Concerning the first index, a solution fits the data well when χ^2 is non-significant ($p \geq .05$). This statistic, however, is sensitive to sample size and therefore other fit indices were also evaluated. For CFI values above or close to .95 are suggestive of a good fit of the model (Hu & Bentler, 1997; Hu & Bentler, 1999), while, RMSEA supports a good fit when values are smaller than .05 (values between .05 and .08 indicate a moderate fit) with the CFit non-significant (Browne & Cudeck, 1993). Finally, a good fit is supported also by SRMR values less than .08 (Hu & Bentler, 1999).

6.5.2. RESULTS

The final model is represented in figure 4 and reached a successful fit to the data: χ^2 was non-significant and all other indices satisfied their rules of thumb: $\chi^2(24) = 23.029$, $p = .518$; RMSEA = .00 [.00, .040], Cfit = .990; CFI = 1.00; SRMR=.030.

Coherently to expectations, Lie dimension reported significant effects on all criterion variables. Furthermore, these effects were only indirect and mainly mediated by conservatism-related values (security, conformity, and tradition).

Specifically, Lie dimension reported a negative effect on quest religiosity mediated by self-enhancement values (Achievement, Power) ($\beta = -.096, p \leq .01$), and positive effects on the other two religiosity facets (intrinsic $\beta = .257, p \leq .001$; extrinsic $\beta = .296, p \leq .001$), mediated by conservatism values (see Table 19).

As hypothesized, all criterion variables were influenced by predictors (PEN traits), through both direct and indirect effects, mediated by the four sets of values (openness to change, self-transcendence, self-enhancement, conservatism) (see Tables 16, 17, and 18). Psychoticism, for instance, had negative effects on all criterion variables. This trait, in fact, was negatively tied to “quest” and intrinsic facets of religiosity, by the mediation of self-transcendence and openness to change values. Specifically, a negative indirect effect on quest religiosity was mediated by self-transcendence values ($\beta = -.091, p \leq .01$), while openness to change values mediated two negative effects on intrinsic ($\beta = -.048, p \leq .05$) and quest religiosity (but this last effect was non-significant; $\beta = -.032, n.s.$). P moreover reported also a negative and direct effect on the extrinsic facet of religiosity ($\beta = -.132, p \leq .05$), but this effect was contrasted by a positive indirect effect mediated by self-transcendence values ($\beta = .118, p \leq .001$).

The other two traits (E and N), instead, reported a more complex configuration of effects. Extraversion, for instance, had a positive direct effect on intrinsic religiosity ($\beta = .236, p \leq .01$), but it was opposed by a negative indirect effect mediated by openness to change values ($\beta = -.229, p \leq .001$). Furthermore, also the influence on quest religiosity was characterized by indirect contrasting effects.

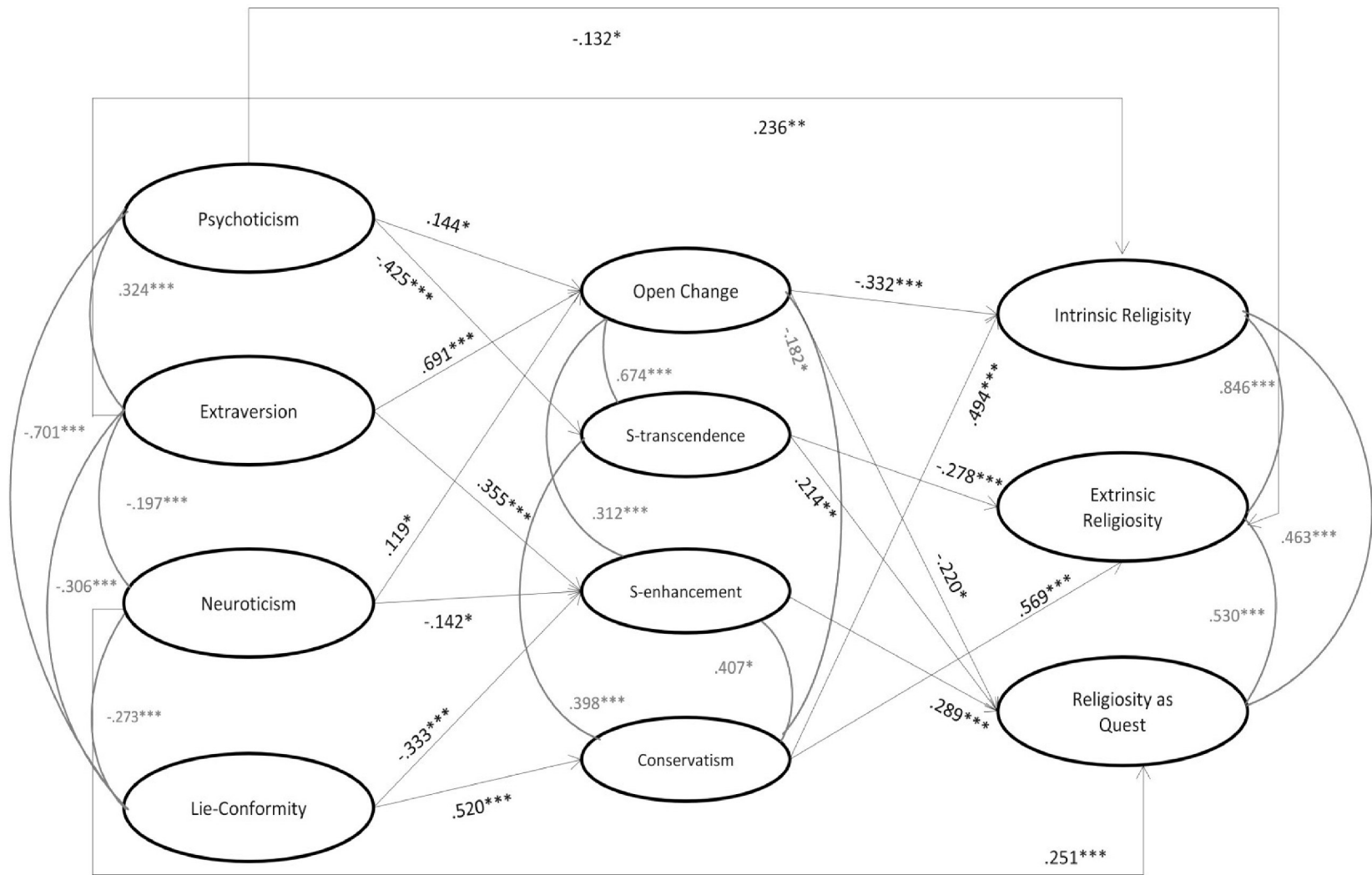


Figure 4: Relations between variables. Standardized coefficients (***= $p \leq .001$, ** $p \leq .01$, * $p \leq .05$). For the sake of simplicity in this diagram λ (indicator-variable) have been omitted (values ranging between .829 and .937).

Specifically, the positive effect was mediated by self-enhancement values ($\beta = .103, p \leq .01$), while, the negative effect was mediated by openness to change values ($\beta = -.152, p \leq .05$). No direct or indirect significant effect was found between extrinsic religiosity and extraversion. Also for neuroticism no direct or indirect significant effect was found on extrinsic religiosity, however, this trait had direct and/or indirect effects on the other two criterion variables. Neuroticism, in fact, had a positive direct effect on quest religiosity ($\beta = .251, p \leq .001$) and a negative indirect effect on intrinsic religiosity, mediated by openness to change values ($\beta = -.039, p \leq .05$).

Finally, neuroticism had a negative indirect effect on quest religiosity ($\beta = -.067, p \leq .05$), through two low effects mediated by openness to change ($\beta = -.026, n.s.$) and self-enhancement values ($\beta = -.041, n.s.$).

P	Intrinsic Orientation				
	Tot. Effect	Tot. Indirect	Open Change	Direct	
[CI95%]			-.048*		
			[-.094, -.001]		
P	Extrinsic Orientation				
	Tot. Effect	Tot. Indirect	S-Transcendence	Direct	
[CI95%]	-.014 <i>n.s.</i>		.118***	-.132*	
	[-.128, .100]		 [.050, .187]	 [-.257, -.007]	
P	Quest Orientation				
	Tot. Effect	Tot. Indirect	Open Change	S-Transcendence	Direct
[CI95%]		-.123**	-.032 <i>n.s.</i>	-.091**	
		 [-.211, -.034]	 [-.070, .007]	 [-.166, -.016]	

Table 16: Direct, indirect, and specific effects of Psychoticism on criterion variables. MLR estimates (* $p \leq .05$, ** $p \leq .01$, * $p \leq .001$). 95% bootstrap confidence interval in bold.**

E		Intrinsic Orientation			
	Tot. Effect	Tot. Indirect	Open Change		Direct
	.007 <i>n.s.</i>		-.229***		.236**
[[CI95%]]	[-.082, .095]		[-.367, -.091]		 [.069, .402]
		Quest Orientation			
	Tot. Effect	Tot. Indirect	Open Change	S-Enhancement	Direct
		-.050 <i>n.s.</i>	-.152*	.103**	
[[CI95%]]		[-.151, .052]	[-.280, -.024]	 [.030, .175]	

Table 17: Direct, indirect, and specific effects of extraversion on criterion variables. MLR estimates (* $p \leq .05$, ** $p \leq .01$, * $p \leq .001$). 95% bootstrap confidence interval in bold.**

N		Intrinsic Orientation			
	Tot. Effect	Tot. Indirect	Open Change		Direct
			-.039*		
[[CI95%]]			[-.077, -.002]		
		Quest Orientation			
	Tot. Effect	Tot. Indirect	Open Change	S-Enhancement	Direct
	.184**	-.067**	-.026 <i>n.s.</i>	-.041 <i>n.s.</i>	.251***
[[CI95%]]	 [.060, .308]	[-.124, -.010]	[-.058, .006]	[-.086, .003]	 [.132, .371]

Table 18: Direct, indirect, and specific effects of neuroticism on criterion variables. MLR estimates (* $p \leq .05$, ** $p \leq .01$, * $p \leq .001$). 95% bootstrap confidence interval in bold.**

L		Intrinsic Orientation			
	Tot. Effect	Tot. Indirect	Conservatism		Direct
			.257***		
[[CI95%]]			 [.181, .333]		
		Extrinsic Orientation			
	Tot. Effect	Tot. Indirect	Conservatism		Direct
			.296***		
[[CI95%]]			 [.205, .386]		
		Quest Orientation			
	Tot. Effect	Tot. Indirect	S-Enhancement		Direct
			-.096**		
[[CI95%]]			[-.165, -.027]		

Table 19: Direct, indirect, and specific effects of Lie/Conformity on criterion variables. MLR estimates (* $p \leq .05$, ** $p \leq .01$, * $p \leq .001$). 95% bootstrap confidence interval in bold.**

6.5.3. DISCUSSION

The aim of this study was to provide a contribution to understanding the meaning of the Lie scale, exploring at the same time relations between PEN-L traits, values of the Schwartz model (Schwartz et al., 2001), and three religiosity facets: intrinsic orientation (religion as “end”), extrinsic orientation (religion as mean), and religion as “quest” (RLOS; Voci, 2015). Specifically, it was hypothesized that Lie scale should be conceived as the measure of a social-conformity disposition and not only a dissimulation detector. It was expected, therefore, that this disposition would show a significant relation with conservatism-related values (tradition, security and respect of conventionalities), which in turn were expected to report significant relations with religiosity. Consequently, it was hypothesized that the well-known relation between religiosity and Lie scale would be mediated by these values. Results substantially supported these expectations: Lie (social-conformity) dimension, in fact, reported strong relations with conservative values, supporting the idea that the scale should be conceived as a social conformity measure. Moreover Lie scale reported also the expected relations with religiosity and these relations were mediated by values. Specifically, Lie scale had only indirect effects on religiosity, mainly mediated by conservatism-related values. In particular, Lie scores had a positive relation with conservatism values, which in turn had positive effects on the two more conventional facets of religiosity: “intrinsic” and “extrinsic”. Conformist people, in other words, because they follow conservatism-related values, such as tradition, security and conformity to social rules, have also a conformist approach to religion, which may be manifested through the acceptance of conventional religious practices or convictions (extrinsic and intrinsic religiosity). Furthermore, social conformity (Lie) had an indirect

negative effect on the quest facet of religiosity, mediated by self-enhancement values. This facet of religiosity is the least conventional and was positively tied to self-enhancement values (achievement and power), which represent the desire to gain personal success, prestige and control or dominance over people, through demonstrating competence (Schwartz, 2012). These values, on the other hand, were negatively tied to Lie scores. Conformist (Lie) people consequently, demonstrating little interest in self-enhancement values, reported also reduced attention on quest facet of religiosity.

Beside these findings, also the expectations about relations between the other PEN traits and religiosity were substantially met. These relations, in fact, could be better understood taking into account the contribution of values, which mediated several effects on all religiosity facets. The role of psychoticism, for instance, was mainly negative and largely mediated by two sets of values. Specifically, the negative effects of this trait on quest and intrinsic religiosity were only indirect and mediated by the preference for openness to change (self-direction, stimulation and hedonism values) and self-transcendence (universalism and benevolence) values. In contrast, the negative effect on the extrinsic facet of religiosity was direct, but opposed by an indirect positive effect mediated by self-transcendence values. These values promote cooperative and supportive social relations, and are tied to spiritual goals (Schwartz, 2012). However, as highlighted by results of this research, self-transcendence values, while supporting the profound existential dialogue and the reflective approach to religion (quest), reported also a negative effect in the extrinsic facet of religion, which is probably interpreted with a critical approach. This negative effect, on the other hand, was not perceived by tough-minded (psychotics) individuals, who being far from the spiritual issues festered by self-transcendence values, may have a less critical approach to the conventional religious practices. Tough-minded (psychotics), in any case, are antisocial, lacking in empathy, unhelpful, cruel and,

unfriendly, and consequently they reported to avoid participation in religious activities (extrinsic). Tough-minded (psychotics), furthermore, as mentioned above, revealed interest in values tied to the search for pleasure, freedom, and enjoying experiences (openness to change values: self-direction, stimulation and hedonism) (Schwartz, 2012), which were negatively related to the more interior and mature religiosity facets (intrinsic and “quest”). Globally, therefore, it should be said that tough-minded (psychotics) demonstrated a negative approach to religion and little attention to spiritual issues.

Neuroticism and extraversion, in contrast, as expected on the basis of literature, reported less defined effects (Francis, 1985). Extraversion, for instance, had only one direct positive effect on the intrinsic aspect of religiosity, but it was opposed to an indirect negative effect, mediated by openness to change values. Furthermore, also the relation with quest orientation was characterized by two contrasting effects, and no direct or indirect significant effect was found on the extrinsic facet of religiosity. Specifically, results indicated that for extraverts the quest approach to religion is fostered by the attention on self-enhancement values, while it is undermined by the influence of openness to change values. Extraverts, in other words, demonstrated that they could be attracted by seeking comfort in religious interior convictions (intrinsic religiosity), but at the same time, following values tied to stimulation and hedonism, they reported also a reduced orientation for existential and religious reflection (quest and intrinsic religiosity). The critical and profound spiritual dialogue (quest), however, although being undermined by the propensity of extraverts for openness to change values, is fostered by the positive mediated effect of self-enhancement values. These values, in fact, are tied to self-affirmation and materialistic goals (Schwartz, 2012) and were related to a critical and non-conventional approach to religiosity (quest).

Also the role of neuroticism in the religious orientations could be better understood by looking carefully at the contribution of values. Neuroticism, specifically, had relevant effects on two religiosity facets: quest and intrinsic. On intrinsic religiosity, the effect was negative and only indirect: mediated by openness to change values; while, on quest religiosity a positive direct effect was opposed by two smaller negative effects, mediated by openness to change and self-enhancement values. Results, in other words, suggest that neurotics are attracted by the more profound, unconventional and existential aspects of religiosity (quest). Neurotics, however, being anxious, concerned and emotional, demonstrated interest in values such as: hedonism, self-direction and stimulation (openness to change), which help to avoid threatening feelings and foster, on the contrary, the search for the optimal positive level of activation (Schwartz, 2012). These values, on the other hand, revealed a negative effect on religious or spiritual reflections (intrinsic and quest religion). Furthermore, the interest for existential issues (quest) is affected also by a negative (marginally significant) effect mediated by the reduced interest of neurotics for self-enhancement values. Neurotics, in other words, revealed little interest in achieving success and more attention on avoiding negative feelings.

In summary the findings of this study provided convincing evidence about the role of values between traits and religious orientation, contributing at the same time to the definition of the meaning of Lie scale. Lie scale, in this study, was conceived as the measure of a social conformity trait and, according to expectations, was related to security and conformity to traditional norms (Schwartz, 2012). This link, therefore, seems to suggest that Lie scale really could represent a social conformity measure. Moreover, results indicated that the well known relation between religiosity and Lie scale (Francis et al., 1989; Gillings & Joseph, 1996; Lewis, 2000; Pearson & Francis, 1989) should be completely attributed to the mediation of values, and mainly to the contribution of

conservatism-related values. The research provided, furthermore, an interesting contribution about the exploration of relations between religiosity and PEN traits. As suggested in literature the more defined role was the negative effect of psychoticism on religious experience, but also other traits reported interesting effects (Eysenck, 1998; Francis, 1985; Gillings & Joseph, 1996; Maltby, 1998; Wilde & Joseph, 1997). Specifically, the findings of this study suggested that the controversial role of neuroticism and extraversion, highlighted by previous researches, could be attributed, at least partially, to the effect of values. These traits, in fact, have several effects on the different facets of religiosity, but mainly mediated by values, and with contrasting directions. These contrasting effects, moreover, being mediated by values could be strongly influenced by cultural aspects and, therefore, further cross-cultural evidence seems strongly recommendable in order to better understand the specific contribution of each trait.

7. GENERAL DISCUSSION

The aim of this work was to provide a contribution toward the validation of the Junior Eysenck Personality Questionnaire Revised (JEPQ-R) in the Italian context, devoting moreover a special attention to the meaning and functioning of its Lie scale (social desirability scale). This instrument represents the last refinement of the Eysenck questionnaires for the assessment of personality among adolescents, and was developed by Corulla in 1990. Eysenck questionnaires (adults and junior scales) are very appreciated and diffused in many countries, but despite their usefulness for several professional or scientific purposes an Italian version of JEPQ-R is not available. In the first step of this work, therefore, the questionnaire was translated (and back-translated by a native English speaker) and administered to a large sample of adolescents aged between 13 and 17 ($N=595$; Female 354; Mean Age= 15.58, $SD=1.020$), in order to test its metric characteristics. Analyses were mainly addressed to evaluate: distributions, reliability, validity, factor structure and metric invariance across genders and two age classes (13-15 and 16-17). Results supported the adequacy of metric characteristics of the questionnaire and confirmed improvements over the previous (English) version (Eysenck, & Eysenck, 1975). Specifically, reliability was evaluated using different methods: *KR-20*, composite reliability (parcel MLR, binary items WLSMV), and test-retest (four-week interval). Results reported satisfactory indices for all scales. As expected P scale obtained the lowest coefficients, however results were in general more than acceptable. Further analyses were performed to test factor structure. Results confirmed the four-factor structure ($\chi^2(164)= 301.509$, $p \leq .001$; CFI = .956; TLI = .949; RMSEA = .387 [.031, .044]; SRMR=.047) and its metric invariance across genders and two age classes (13-15 and 16-17). Finally, other

interesting confirmations about validity of scales were provided by analyses of correlations between JEPQ-R (PEN traits) and BFQ-2 (FFM traits) scales (BFQ-2; Caprara et al., 2007). As expected a positive and strong correlation was found between energy (BFQ-2) and extraversion (PEN) ($r = .473, p \leq .01$), while, a negative correlation was identified between emotional stability (BFQ-2) and neuroticism (PEN) ($r = -.682, p \leq .01$). Moreover, in accordance with literature, P scale reported relations with three of the BFQ-2 scales: conscientiousness ($r = -.254, p \leq .01$), agreeableness ($r = -.343, p \leq .01$) and openness ($r = -.183, p \leq .01$) (e.g., Barbaranelli et al., 2003; Draycott & Kline, 1995 ; Heaven et al., 2013; McCrae & Costa, 1985 ; Saggino, 2000 ; Scholte, & De Bruyn, 2004).

It could be concluded that in the present study the adequacy of psychometric characteristics of PEN-L scales of the JEPQ-R has been supported. As expected on the basis of literature, E and N were the two more defined and psychometrically robust dimensions, while P, although confirming its complexity, reported characteristics more than acceptable.

P scale has been always the most problematic and controversial of the Eysenck model. However, an interesting and intense debate over the years has been addressed also to another dimension: Lie scale. This scale was included in the Eysenck questionnaires starting from the early 1960s (Eysenck & Eysenck, 1964) and can be considered a typical impression management measure (facet of social desirability bias). The scale is frequently used, in several professional or scientific settings, to assess the tendency of subjects to provide positively inflated profiles. It should be noted, however, that increasing literature has questioned the effectiveness of Lie scale (and social desirability scales in general) in detecting dissimulation. Specifically, concerning the Eysenck Lie scale, several concerns have been raised about dimensionality (one or two-factor structure), functioning across situations (high vs low motivation to fake) and meaning of the scale. Eysenck, for instance,

suggested that Lie scale could be useful to detect dissimulation in competitive situations, while in neutral conditions it should be better conceived as the measure of a social conformity trait. In order to provide a contribution about these topics, in the present work, three studies and a series of analyses were performed. In particular, dimensionality of the scale was tested through EFA (exploratory factor analysis), CFA (confirmatory factor analysis) and PA (parallel analysis), while strong invariance was tested through MGCFA (multiple-group confirmatory factor analysis, model for binary data). Results indicated the adequacy of the one-factor structure, and supported its invariance across two conditions: *standard* (honest) or *fake-good* instructions. These findings suggested that the 19 items of the scale had the same pattern of loadings across the two conditions, measuring the same consistent trait, with the same item-trait relations in both situations. Analyses, however, were not sufficient to define exactly the label to assign to this trait. Results of this study, on the other hand, in accordance with the findings of previous studies (e.g., Ferrando & Chico, 2001; Uziel, 2010), suggested that Lie scale is sensitive to fake manipulations. Lie scores, in fact, were higher in faking-good conditions. It should be noted, however, that the sensitivity to dissimulation of Lie scale is analogous to that of other PEN scales. Also P and N scales, in fact, reached more socially desirable scores under faking-good instructions. The effectiveness as bias detector of the scale was better analyzed in the third study of this work. In this study, self and informant reports of personality were collected in a large sample of adolescents ($N=325$ students; 141 male; mean age 15.47, $SD = .96$), using the JEPQR-A questionnaire (Junior Eysenck Personality Questionnaire Revised-Abbreviated) (Francis, 1996). The tool assesses the three PEN traits, and L scale through 24 items only. Metric characteristics of the instrument (in the Italian context) were evaluated in the first step of the research, and provided satisfactory results: the four-factor structure (PEN-L) was confirmed and reliability (Cronbach's

Alpha), even if lower than in the full version, revealed satisfactory coefficients (for scales including six items only). In the second part of this study, instead, several analyses were performed using self and informant-reports, in order to test the effectiveness of Lie scale in detecting dissimulation. Informant-reports were conceived as external criteria, less biased than self-report, and therefore the variance shared between self and informant-ratings was considered the real trait variance (informant-reports were provided by one classmate for each participant). Analyses, in particular, focused on examining: zero-order correlations between self and informant-reports, part correlations where the contribution of Lie scale was partialled-out, and the moderation effect of Lie scale between self and informant-ratings. Furthermore a bias index, conceived as the residual variance after regressing self-reports on observer-ratings, was calculated for each PEN trait, and correlated with Lie scores (residuals represent the self-report inflation because all the variance shared by informant and self-report is removed) (Paulhus & John, 1998). Results on an overall plain, suggest that subjects answered quite honestly to all scales, Lie included. Zero-order correlation between self and informant-report, in fact, for all scale were positive and relatively high/moderate, and in some cases self-reports were less socially desirable than informant ratings. Furthermore analyses suggested that Lie scale had a low effectiveness as bias detector and suggested, on the contrary, an interpretation more tied to a social conformity trait. For all PEN traits, in fact, the self-informant agreement was not influenced after controlling for Lie score, nor have moderating effects been detected. Moreover analysis of correlations between Lie scores and PEN-bias indices highlighted that Lie scale was not related to dissimulation tendencies (bias index) of N and E. An unexpected relation, however, was found between Lie scores and P-bias. In particular, this relation even if low or moderate was significant but negative. This curious finding seems to indicate that as more people describe themselves honestly on P, the

higher is their Lie score. These results, therefore, place serious skepticism on the effectiveness of the scale as bias detector. These data, however, might be tentatively interpreted considering Lie scale as a social conformity measure. In other words it could be supposed that the more a person is “well-behaved” and conformist (high lie), the smaller is the discrepancy between self and informant descriptions about P and related behaviors (for instance: coldness, rudeness, cruelty, unreliability, and lying paradoxically!). According to this hypothesis, Lie scale rather than a bias-detector should be considered as the measure of honest descriptions, tied to a consistent disposition characterized by social conformity. This view is coherent with the findings of many researches, and in line with some suggestions by Eysenck. Moreover this interpretation of Lie scale seems consistent with the well-known relation between Lie scale and religiosity. Lie scale and religiosity, in fact, have been found positively tied in many studies, raising several questions and suggestions. This topic, specifically, was better explored in the third study of this work, where relations between PEN-L traits and religiosity were accurately analyzed through a structural equation model. This study, in particular, was aimed to test the mediation role of Schwartz’s values between personality traits and religious orientation (extrinsic, intrinsic and quest facets of religiosity). This research focused on understanding two main aspects: the meaning of Lie scale, and the relations between religiosity and individual dispositions (traits and values). In the tested model, in fact, PEN traits and Lie scale, conceived as the measure of a social conformity disposition, were considered as independent variables, while values (second-order factors: openness to change, conservatism, self-transcendence, and self-enhancement) and three facets of religiosity (intrinsic, extrinsic and quest orientations) were respectively mediators and criterion variables. Specifically, it was expected that Lie scale scores representing a social conformity disposition should have reported a strong relation with conservatism-related

values (security, tradition, conformity), which in turn were expected to have a role in religious experience. In other words the relation between religiosity and Lie scale was expected to be mediated by conservatism-related values, and due to the meaning of the scale (social conformity rather than dissimulation). Moreover it was expected that the well-known, but controversial, relations between PEN traits and religiosity would be also mediated by values. Results, in general, meet expectations; Lie scale, in fact, was related to religiosity only indirectly and mainly through the mediation of conservatism-related values. Lie scale, in other words, coherently to expectations revealed relevant and positive relations with conservative related-values, which in turn were related to the two more conventional facets of religiosity (intrinsic and extrinsic). This result, therefore, seems to suggest that Lie scale could really assess the “honest” answers of subjects about an individual disposition characterized by social conformity (and “well-behaved” conducts). The model, furthermore, highlighted several and interesting relations also between the other PEN traits and religiosity. The more defined role has been the negative effect of psychoticism on religiosity, through both direct and indirect paths (mediated by self-transcendence and openness to change-related values). Relevant relations, moreover, were found also between the other two traits (N and E) and religiosity. These dimensions, in fact, had several effects on the different facets of religiosity, but mainly mediated by values, and with contrasting directions. This result is consistent with previous studies. Relations between N, E and religiosity, in fact, are debated and contradictory. Controversial findings, on the other hand, as highlighted by results of this research, could be attributed to the complex mediation effects of values.

In summary, results of this work provided a series of contributions about several topics. First of all, two well-known Eysenck’s questionnaires for adolescents (JEPQ-R and JEPQR-A) were tested in the Italian context, providing adequate and interesting results. This

contribution seems relevant because Eysenck theory and questionnaires are popular and appreciated in many different countries, even if not really diffused in Italy in their junior versions. These instruments, however, due to their strong tradition and to their effectiveness are very useful in many scientific and professional settings. The Eysenck theory, in fact, has been accurately studied, and great attention has been devoted to many of the most relevant topics in the field of personality, as for instance the identification of the best and basic dimensions needed to describe personality or the analysis of biological foundations of traits.

In addition to these contributions, this thesis explored also the largely debated topics of meaning and effectiveness of social desirability scales. Results, in general, although confirming some sensitivity of Lie scale to faking, raised some skepticism about the usefulness and effectiveness of using these scales as bias-detector and suggested, on the contrary, an interpretation more tied to a social conformity disposition. This suggestion, for instance, was analyzed exploring relations between PEN-L traits and religiosity. Results revealed strong relations between Lie scores and conservatism-related values, and highlighted that relations with religiosity were mediated by these last constructs. This study, however, provided a consistent contribution not only about Lie scale, but also concerning relations between religiosity and the other PEN traits. Specifically, about N and E it was suggested that previous inconsistent findings should be attributed, at least partially, to the complex and contrasting mediation effect of values. About P, instead, in accordance with literature, a more defined and negative effect was confirmed (Francis, 1985). P scale has been always the most controversial and complex dimension of the Eysenck model, with psychometric weaknesses, and a meaning not completely defined. In this study, however, P scale although confirming its complexity, revealed an interesting nature. This scale, in fact, was the most psychometrically limited but, on the other hand,

its indices were more than acceptable (mostly when analyzed taking into account its complexity and dichotomous data). Moreover, its meaning, consistently with the suggestion of several studies, confirmed strong connections with agreeableness, conscientiousness, and openness of the FFM. Finally, it is interesting to note that, despite the uncertainties about its nature, this trait was the most clearly tied to religiosity. This result, however, is not surprising because P dimension, even if often questioned, is also frequently related to many relevant constructs or life outcomes. Future research, therefore, should better explore its contribution in several subjective experiences and try to explore better its nature, improving eventually psychometric characteristics of assessment tools. Future research, moreover, should devote more efforts in order to make Lie scale more effective, exploring at the same time its conventional or non-conventional meanings.

8. APPENDIX 1

Italian translation of the questionnaire.

1. Ti piace essere circondato dall'euforia e dall'eccitazione?
2. Sei lunatico?
3. I giovani dovrebbero rispettare sempre le regole?
4. Hai mai pensato egoisticamente più a te stesso che agli altri?
5. È importante avere buone maniere?
6. Di solito quando qualcuno ti parla, rispondi velocemente?
7. Ti annoi molto facilmente?
8. Pensi che sia pericoloso sniffare sostanze chimiche che possono dare effetti "strani"?
9. Fai sempre le cose appena ti vengono richieste?
10. Idee e pensieri corrono nella tua mente impedendoti di dormire?
11. Ti divertono gli scherzi che potrebbero, in alcune occasioni, ferire realmente le persone?
12. Preferisci stare da solo anziché divertirti con i tuoi coetanei?
13. Hai mai trasgredito le regole a scuola?
14. Ti piacerebbe che i tuoi coetanei avessero paura di te?
15. Sei una persona abbastanza allegra?
16. Hai molti amici?
17. Ti senti mai "molto infelice" senza nessuna ragione?
18. Hai mai finto di non aver sentito che qualcuno ti stava chiamando?
19. Hai mai preso qualcosa (anche uno spillo o un bottone) che apparteneva ad altri?
20. Ti piacerebbe esplorare un antico castello infestato dai fantasmi?
21. Ti diverte fare del male alle persone a cui vuoi bene?
22. Ti capita spesso di pensare che la vita è molto noiosa?
23. Ti sembra di partecipare a molti litigi?
24. Finisci sempre i tuoi compiti prima di prenderti degli svaghi?
25. Ti piace fare cose in cui devi agire velocemente?
26. Ti preoccupi per le brutte cose che potrebbero accadere?
27. Ti sentiresti molto dispiaciuto nel vedere un animale preso in trappola?
28. Sai animare una festa?
29. Ti senti facilmente ferito quando le persone trovano qualcosa di sbagliato in te o in un tuo lavoro?
30. Ti turberebbe molto il vedere un cane o un gatto che è appena stato investito?
31. Ti scusi sempre se pensi di essere stato maleducato?
32. I tuoi genitori sono troppo severi con te?
33. Pensi che lo scii nautico potrebbe essere divertente?
34. Ti senti spesso stanco senza ragione?
35. Tu disapprovi i bulli?
36. Tu stai sempre in silenzio quando le persone più grandi di te stanno parlando?
37. Quando fai nuove amicizie solitamente sei tu a fare il primo passo?
38. I tuoi genitori sono veramente brave persone?

39. A volte prendi in giro o fai il bullo con i tuoi coetanei?
40. Sei permaloso su alcuni argomenti?
41. Hai mai detto cose cattive o sgradevoli sugli altri?
42. Ti piace raccontare barzellette o storielle agli amici?
43. A scuola, rispetto alla maggior parte dei tuoi coetanei, ti metti più spesso nei guai?
44. Generalmente raccogli le cartacce e i piccoli rifiuti che gli altri gettano per terra in classe?
45. Hai molti hobby e interessi diversi?
46. Vieni preso di mira dagli insegnanti più dei quanto accade ai tuoi compagni?
47. Ti turberebbe molto veder soffrire dei tuoi coetanei?
48. I tuoi sentimenti possono essere feriti facilmente?
49. Ti piace fare scherzi agli altri?
50. Ti lavi sempre le mani prima di mangiare?
51. Alle feste preferisci stare seduto a guardare piuttosto che partecipare?
52. Talvolta ti piace molestare gli animali?
53. Ti senti spesso scocciato/scontento?
54. Sei sempre tranquillo in classe, anche quando l'insegnante è fuori dalla stanza?
55. Ti piace fare cose che fanno un po' paura?
56. A volte ti capita di essere così irrequieto da non riuscire a stare seduto a lungo sulla sedia?
57. Disapprovi i tuoi coetanei che non sanno comportarsi bene?
58. Durante cerimonie religiose o ricorrenze tu canti sempre quando gli altri stanno cantando?
59. Ti sembra di essere coinvolto in zuffe più spesso dei tuoi coetanei?
60. Ti piace stare assieme ai tuoi coetanei?
61. Ti piacerebbe lanciarti con il paracadute?
62. Ci sono tuoi coetanei che vogliono farti del male?
63. Rimugini a lungo su un'esperienza imbarazzante?
64. Mangi sempre tutto quello che ti viene offerto ai pasti?
65. Generalmente nelle feste movimentate riesci a lasciarti andare e a divertirti?
66. La gente dovrebbe cercare sempre di non essere scortese?
67. A volte senti che la vita non vale la pena di essere vissuta?
68. Sei mai stato sfacciato con i tuoi genitori?
69. Decidi spesso di fare le cose all'improvviso?
70. Ti distrai spesso quando stai facendo un compito?
71. Ti diverte fare immersioni o tuffarti in mare o in una piscina?
72. I tuoi coetanei ti raccontano molte bugie?
73. Trovi difficile addormentarti la notte perché ci sono cose che ti preoccupano?
74. Hai mai scritto o scarabocchiato su un libro della scuola o della biblioteca?
75. Le altre persone pensano che tu sia abbastanza vivace?
76. Ti senti spesso solo?
77. Sei sempre particolarmente attento con le cose di altre persone?
78. Condividi sempre con gli altri i tuoi snack (caramelle, chewing gum...)?
79. Ti piace molto uscire?
80. Hai mai barato al gioco?
81. Trovi difficile divertirti veramente alle feste movimentate?
82. A volte ti capita di sentirti particolarmente allegro o triste senza una buona ragione?
83. Ti capita di buttare carta straccia sul pavimento se non hai il cestino a portata di mano?

84. Ti definiresti uno che prende il mondo come viene?
85. Hai bisogno spesso di amici premurosi per tirarti su il morale?
86. Ti piacerebbe guidare o salire su una moto veloce?
87. Pensi che i tifosi violenti siano persone cattive?
88. Sono molte le cose che ti irritano?
89. Ti piace parlare molto?

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