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Rigidity and its relations to the basic dimensions of personality

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Abstract: *The paper examines rigidity and its relations to the basic dimensions of personality as they are identified by the Big Five's factors and Eysenck's personality model. Empirical data come from two studies with Bulgarian adults who have been tested with a Bulgarian questionnaire for measuring dimensions of personality rigidity as perseveration, rigidity, and dogmatism. Study 1 involved 150 students from 3 different universities who filled in the questionnaire on personality rigidity and the Bulgarian form of the IPIP-50 measure. In Study 2, 30 men and 30 women filled in online the same questionnaire on personality rigidity and the Bulgarian adaptation of the Eysenck's Personality Questionnaire. In the paper we first discuss the concept of rigidity, its scope and content, and outline the relations between the dimensions of personality rigidity and other personality traits. Then we compare the results of the two empirical studies. Finally, we draw conclusions about where and how the measures of rigidity fit into the big five model of personality. Correlational and factor analyses revealed association between perseveration and neuroticism, replicated across the two samples, while rigidity tended to be related to conscientiousness and psychoticism. Our findings support the need of a closer examination of the particular manifestations of rigidity when measures of rigidity are considered or when its relations to personality and behaviour are studied.*

Keywords: perseveration; rigidity; dogmatism; big five's dimensions; Eysenck's personality model.

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Introduction

Psychological study of rigidity has a long, diverse and complex history (Schultz & Searleman 2002). While the influence of interindividual differences in the rigidity of attitudes and behaviors has long been an object of interest in psychological research, there is still a great inconsistency among researchers in how they should define rigidity. Complexity relates to the definition of the concept (both its scope and content aren't easy to delineate), and to reaching agreement as to the most appropriate, reliable and valid instruments in measuring rigidity. Although research has converged on a consensus regarding the multidimensional nature of the construct (Schultz & Searleman 2002), there is still no wide agreement on the nature of its components; no generally accepted definition of psychological rigidity seems to have emerged. The challenge to differentiate rigidity from related concepts is addressed as well. As to the measurement, the main controversy is about the nature of rigidity as a task and situation specific behaviour versus a personality trait, i.e. generalized behavioural disposition (e.g. Van Hiel et al 2016).

In an attempt to contribute to this discussion, our paper will focus on the clarification of the personality manifestations which make up the conceptual space of rigidity as a distinct and valid construct, on one hand, and its differentiation from the related concepts. We will discuss both theoretical knowledge and empirical data in order to advance our understanding and respectively further application of the concept of rigidity. We hope our conceptual discussion will contribute to improvements with respect to the measurement of personality rigidity too.

Perseveration and Rigidity

Perseveration, a term introduced by Neisser in 1894, refers to the "tendency for a behavior or thought process to repeat itself, maladaptively and without repetition of stimulus (Cattell 1946a: 229). This is probably the first dimension of rigidity that has been outlined and studied. Perseverative tendency was seen as the tendency of the process to continue spontaneously for varying periods of time after the secession of the stimuli, or persistence of neural and mental processes which facilitates the establishment and maintenance of a set or determining tendency (cited from Rubenowitz 1963). Spearman operationalized it as "mental inertia" or tendency for mental processes to persist long after the conditions to which they were originally due have gone (in Rubenowitz 1963: 13). Cattell (Cattell & Tiner 1949) observes that the tendency to persevere may concern a percept or an emotion or a motor activity, and the inertia of the mental processes is shown in their rising or declining more slowly than their causes, or by their interference with ensuing mental processes. "Rigidity operating against the extinction of unrewarded responses" (Cattell & Tiner 1949); a rigidity of old established habits in the presence of new demands.

The definitions below align with this understanding of rigidity: the inability to change one's approach or point of view in problem solving (Heglin 1956); inability to change one's cognitive set when the objective conditions demand it (Rokeach 1948); lack of change of behavior where a change is necessary for success at task, and where the subject knows that change is likely to be demanded (Chown 1961); inability to shift from one task to another voluntarily when the new task is unrelated to the performance in action (Goldstein 1943) (cited from Lapsley & Enright 1983: 84).

While perseveration and persistence are first used interchangeably, their differentiation will come along the following points: "Whereas "persistent" behaviour has been used to describe active, voluntarily continuous response, "perseverative" behaviour has meant repetition of response through inability to shift to another" (cited from Rubenowitz 1963:15).

Cattell (1946a) considered it necessary to further differentiate between two forms of perseveration. The first one, "inertia of mental processes" manifests itself in alternation tests, i.e. those in which the subject has to switch between two interfering, alternative ways of

performing otherwise equivalent tasks. The second one, "inertia of structural disposition" is measured as the difference between performing a task in some old, accustomed fashion and performing it in some new but not intelligence-demanding fashion. It is called disposition rigidity to distinguish it from the supposed mental inertia shown by aftereffects in immediately successive mental processes. Disposition rigidity points to the difficulty in acquiring new habits or mental sets that conflict with old well-established habits (in Rubenowitz 1963). Cattell (1946a: 234-235) believed the best measure of disposition rigidity is the "creative effort": "the creative effort" tests are those in which one activity is a well-established habit, such as writing S's, and the other activity involves "creative effort" which would be a task of equal complexity but which is quite new and different such as writing S's backward. Later, more complicated tests of such "structural" rigidity were proposed, like the Water Jar Einstellung test – series of problem-solving tasks which induces a set and then measure the difficulty in changing this set when it is to the subject's advantage to do so and presumably not beyond its ability (e.g. Luchins 1949).

Cattell (Cattell & Tiner 1949: 322) also differentiate structural rigidity, as the resistance of a habit or personality trait to forces which might be expected to change it or to cause learning; another way to put it is a failure to make new adaptations. Here the mode of response to a stimulus which is less rewarding continues to be made to that stimulus, totally or partially, on each subsequent repetition of the stimulus situation, despite a more rewarding response being possible. It manifests itself through a failure of a new behaviour to emerge; failure of perception of the relations and correlates necessary to provide the problem-solving responses. It could be a failure of reproduction, i.e, failure in the readiness of random solutions to appear in consciousness (or random, new responses to appear in behavior). Dispersion of attention and random activity would suffice to provide the new "fundaments" on which intelligence may selectively act. Another source of rigidity is through internal dynamic conflict and equilibrium (Cattell & Tiner 1949: 323), when a new response has been experienced or perceived, it does not become established as a new structure This second source is broadly due to internal checks and balances which deny "adaptation" or satisfaction to a particular trait because it would conflict with satisfaction of some other trait or of the total dynamic economy of the organism.

Schaie (Schaie 1955; Schaie et al 1991) incorporated his understanding, based on factor analysis of eight instruments, into a *Test of Behavioral Rigidity* which measures three aspects of rigidity: a) Motor-cognitive = shifting from one activity to another; b) Psychomotor speed = rate of emission of familial cognitive responses; c) Personality-perceptual = adjust readily to new surroundings and change in cognitive and environmental patterns; reflected in the subjects' self-reports. The common among them is the tendency to perseverate and resist conceptual change; to resist acquisition of new patterns of behavior and to refuse to relinquish old and established behavior patterns. He concluded that "…the scores representing the rigidity concept seems to separate into what substantially seems to be a representation of Warner's "functional" and "structural" definitions or what Cattell has classified as "disposition rigidity" and "ideational inertia" (1955, p. 607)

In a similar vein, Steinmetz, Loarer and Houssemand (2011) compared a functional view and a structural view of rigidity in personality. In the functional view of rigidity, rigid persons fail to variably adapt their behaviors and therefore, are lethargic in the variation of their responses. In the structural view, rigidity is the result of a certain degree of independence of "mental regions" delimited by boundaries within the personality structure of an individual: the greater the independence of one personality structure region from an adjacent region, the greater the rigidity of the individual person. In contrast, a person presenting less clearly delimited mental regions is not rigid. We can point to the parallel between perseveration and being lethargic in the variation of one's responses, as well as between the

"creative effort" required to perform an old task in a new way and the greater distance between "mental regions" within the personality structure of the individual.

Recently, the Resistance to Change Scale (Oreg 2003) was designed to measure an individual's dispositional inclination to resist changes. Inspired by the search for individual predictors of individual's inclination to resist organizational change, he comes up with a four-factor solution for the constructed scale. These factors can be related to the differentiation we have adopted: incorporation of routines into one's life and consistency in one's views (as the ease and frequency with which individuals change their minds) refer to the dimension of Rigidity, while emotional reactions to imposed change and the experience of its immediate inconvenience or adverse effects associate with Perseveration.

It should be noted that Cattell also considered the possibility of a general rigidity as a basic attribute of all dispositions: a basic lack of ability to change set, inherent resistance to change of neural discharge paths: "It is necessary to hypothesize individual differences in basic rigidity, though again this rigidity may prove on investigation to be a number of rigidities" (Cattell & Tiner 1949: 325). This inherent rigidity can be related to rigidity of the innately preferred patterns as contrasted with acquired, actual habits; rigidity of old compared with recent habits, rigidity specific to particular drives, e.g. the motivations of hunger (how do I feed myself?) or to specific structures, e.g. rigidity of one's superego. And Eysenck and Eysenck (1962: 180) observed a trend trying to isolate such a single general factor of rigidity by means of questionnaires, given that little consistency have been found in experimental and situational measures of rigidity.

The research on the *Authoritarian Personality* (Adorno et al. 1950) will come to extend our understanding of personality rigidity. By showing that the prejudiced person is a rigid person, the scope of manifestations of rigidity was related also to the content and the structure of one's views, beliefs and social attitudes. This approach and its findings showed that much of the variance in the rigidity of the attitudes and belief systems may be attributed to psychodynamic processes. It also contributed to guide the study of rigidity away from mental and motor perseveration tests into examination of the relation of rigidity to personality and its habitual patterns of behaviour.

Dogmatism

Though inspired by research on the authoritarian personality, Rokeach (1960) referred dogmatism to the organization of one's belief – disbelief system and not to the content of specific beliefs; he related he to close-mindedness of the individual cognitive structure. He defines dogmatism as "resistance to change of systems of beliefs" or "the extent to which a person can receive, evaluate, and act on relevant information received from outside on its own intrinsic merits, unencumbered by irrelevant factors in the situation arising from within the person or from outside" (Rokeach 1960:183). Summarizing the wide range of approaches to the construct, Rokeach defined rigidity as a resistance to change in beliefs, attitudes, or personal habits. The usefulness of this definition is in its multidimensional nature. Personality Rigidity is not simply the perseveration of behavior on a behavioral task, but can be divided into cognitive, attitudinal, and behavioral components. Rokeach used the term dogmatism to refer to resistance to change in a person's belief system. It's not just about rigidly sticking to one's habitual beliefs, it is about a dogmatic maintenance of one's closed system of beliefs (see also Schultz & Searleman 2002). The dimension of Dogmatism outlines new elements in the manifestations of rigidity: not considering evidence or opinion of others as a resistance to change that new data or outside influence could provoke. Similarly, holding undeniable principles, the only true beliefs, unchangeable opinions, inflexible decisions, certainty of beliefs, and being uncompromising when meeting differences (as their acceptance would imply to open and change).

Oreg (2003), in developing a new individual differences measure of resistance to change, found that dogmatism is related to all

the components of this dimension which are routine seeking, emotional reaction to experienced pressure to change, short – term focus, and cognitive rigidity.

In a summary, our analysis showed that in the scope of manifestations of personality rigidity, perseveration of responses and the rigidity of dispositions are complemented by the dogmatism of one's system of beliefs. Such an understanding aligns with the exceptional attempt made by Schultz and Searleman (2002) to regroup and formulate the characteristics for the concept of rigidity. For them the construct of rigidity covers (1) the formation of a behavioral or mental set, and (2) the perseveration of these sets, independently of external information stating that change is required or that the active set is no longer efficient. Mental sets are expectations about future events (including attitudes, beliefs, expectancies, and schemas), whereas behavioral sets are patterns of observable responses. Thus, rigid persons rely on established and familiar patterns of behavior which are not abandoned even if they are maladapted to the (new) situation, and demonstrate an inability to adjust their behaviors variably to the situational circumstances (Schultz & Searleman 2002).

The proposed conceptualization has the advantage of being applicable to both perseveration (as inability to alter the current behaviour) and rigidity (as inability to replace the current behaviour with a different one). To the extent that this definition covers also the formation and perseveration of mental sets, it incorporates the dimension of dogmatism as well. It is with this scope and content of the concept of rigidity that we shall approach the goal of exploring the relations of the manifestations of personal rigidity to the basic dimensions of personality. Before that however we need to clarify two more questions: 1) the relation between rigidity and flexibility, and 2) the differentiation between personality rigidity and related concepts.

Flexibility

It may seem logical and even self-evident that rigidity and flexibility are opposite and therefore occupy the opposite poles of a dimension. Sometimes this is implicitly inferred in the interpretation of the empirical results. Sometimes this assumption appears in scale's development. Gough (cited from Rubenowitz 1963) for example, considered that resistance to change in single habits or set of habits indicated a general lack of flexibility; and *Gough's Rigidity scale* was transformed into Flexibility scale when it was incorporated in the California Personality Inventory. However, a low score on Gough-Stanford Rigidity Scale indicate a person who shows low resistance to change what does not mean (yet) that s/he is also a person with high flexibility in thinking, attitudes and behaviour. Actually, Cattell (Cattell & Tiner 1949: 321) coined the word "stiffness" to denote one's resistance to forces attempting to produce change.

A closer look at psychological research suggests that rigidity and flexibility, though related, are two different constructs (Steinmetz et al 2011), and none of them appears to be unidimensional. We have already examined the concept of rigidity which is to be considered as multidimensional in nature with perseverative behaviors in a multitude of personal habits, dogmatism in beliefs, and rigidity in one's dispositions. Let's now see how flexibility is defined and studied.

First, there is research on interpersonal flexibility (e.g. Paulhus & Martin 1988). In this domain flexibility is defined as adaptive behavioural variability. It is manifested through a wide range of responses available to the individual, and the situational appropriateness of their use in interpersonal situations. Therefore, interpersonal flexibility is one's ability to adjust one's behavior to suit changing interpersonal situations; it is conceptually distinct from indices of mere variability in action. On the other hand, interpersonal rigidity is hypothesized to exist at the trait level, as some people are generally more likely to engage in only one type of behavior regardless of context. This trait level index of rigidity is viewed as a proxy of the ability to vary one's behavior in social situations and indicates the relative exclusive use of certain behaviors regardless of context (Tracey 2005).

However, there are no common indices of interpersonal rigidity or its inverse, flexibility, in the literature on interpersonal relationships. Rigidity - Flexibility is imprecise with respect to (a) appropriateness of behavior and (b) confusion of rigidity and extremeness - the extremeness of behavior, i.e. the relative amount or magnitude of any behavior demonstrated by an individual. These two aspects are overlapping, but different. Two individuals can always be critical (i.e. rigid) but they can vary on how extreme they are, perhaps, for example, with one individual always yelling and the other more quietly chastising (Tracey 2005: 596).

Second, there is a cognitive flexibility (Nijstad et al 2010), operationalised as the number of content categories surveyed, and differentiated from cognitive persistence which indicates the exploration of a few content categories in great depth. Researchers have demonstrated that both can lead to the generation of original ideas, but in relation to different situational and individual factors. For example, activating positive mood states enhance creativity because they stimulate flexibility, while activating negative mood states can enhance creativity because they stimulate persistence. Guilford (Guilford & Hoepfner 1971) differentiated between spontaneous and adaptive flexibility as intellectual abilities and associated them with two different temperament traits – perseveration and persistence. Cattell also separated perseveration from perseveration – like factors such as some sort of will factor – a persistence of directive ideas – rather than natural perseveration, i.e. the perseveration of basic habits (Cattell 1946a: 233). Similarly, perseveration is differentiated from habit (Schultz & Searleman 2002) The habit as a typical pattern of behavior is a behavioral set. Behavioral sets are not rigid in and of themselves; it is only when a behavioral pattern perseverates in the face of pressure to change that it meets our definition of rigidity (Schultz & Searleman 2002: 170).

Though flexibility and rigidity have some common references (as the number of alternatives available to the individual, for example), in their own field of research the definitions of flexibility emphasise the adaptive character of behavioural variability, while personality rigidity is generally perceived as a resistance to change when change is required.

Personality Rigidity and Related Concepts

The lack of theoretical rigor in the definition of rigidity and the methodological difficulties that it entails were emphasized in a recent large-scale meta-analysis (Van Hiel et al 2016). Given that already Cattell (1946a) recognized the necessity to consider personality and general associations of the rigidity factor(s) in complete detachment from perseveration itself, we may assume that definitional issues haven't been satisfactorily resolved. One of their manifestations are the use of many and different rigidity-related concepts as proxies for the assessment of individual differences in personality rigidity (e.g. Schultz & Searleman 2002; Van Hiel et al 2016). Below we are going to compare and contrast personality rigidity with some of the most exploited rigidity - related substitutes. The aim of these comparisons is to further specify the scope and the content of the manifestations of rigidity in personality and to draw researchers' attention to distinctions which the current practice tend (most likely, involuntarily), to blur, ignore or dismiss.

1. *Rigidity* is not *intolerance of ambiguity.* While research literatures on rigidity and intolerance of ambiguity are closely related, the two constructs are often intercorrelated (Stoycheva, 2003), and they happen to even being treated as synonymous (Schultz & Searleman 2002), these constructs relate to different personality manifestations; thus the use of Budner's Intolerance of Ambiguity scale, for example, as a measure of rigidity is not really warranted. As we have seen, personality rigidity describes individual behaviour in situations where there is a need of change in one's way of thinking or acting, and is manifested in inability/resistance to change, in adopting fixed programs and strictly following routines, or in adhering to a closed worldview and system of beliefs. The notion of ambiguity tolerance describes individual

behaviour in ambiguous situations where there is no clarity in the available information. Individual differences range from tolerance (capacity to live with) to intolerance of ambiguity which is manifested in avoidance of ambiguity in situations, people, events or ideas (Stoycheva 2003). These two constructs describe different type of responses to different challenges within the situations. The change that is resisted is not necessarily ambiguous, and intolerant behaviour towards ambiguity is not necessarily rigid. Even if we assume that avoidance is a common hehavioural response, rigid person avoids encounters with change, while intolerant person avoid encounters with ambiguity.

2. *Rigidity* can be seen as a consequence of *anxiety,* understood as repressed hostility and basic anxiety during childhood - a way of warding off an overpowering threat is to act according to a special rigid pattern (Rubenowitz 1963: 37): "By rigidity in reaction I mean a lack of that flexibility which enables us to react differently to different situations". Related to that lack of flexibility is a resistance to change in behaviour, beliefs and attitudes, where everything that is new and unknown and does not fit the pattern that has been learnt and reinforced is experienced as threatening. Resistance to change in behaviour often leads to stereotyped, compulsively adhered habit formations such as fixed routine in eating habits or in work procedures, and to stereotyped beliefs and attitudes. And Rokeach (1960) perceived the closed belief - disbelief system as permitting the individual to defend him/herself from anxiety, through identification with an absolute authority or cause.

While the importance of anxiety in the formation of the manifestations of rigidity is underscored, it is also important to note that in some situations a mitigated form of anxiety may result in nonrigid behaviour, as some anxiety and doubts may be needed for change. Thus, anxiety per se should not be expected to lead to or indicate rigidity even if it most often does so when it occurs to a pronounced or enduring degree (Rubenowitz 1963: 37).

3. *Rigidity* in personality is not the same as *ethnocentrism, prejudice*, *conservatism, or right-wing political orientation*. As Luchins aptly put it, "Stereotype should not be confused with stereotypy in spite of the similarity in spelling" (Luchins 1949: 452). Research on the *Authoritarian Personality* (Adorno et al. 1950*),* showing that the prejudiced person is a rigid person in many different ways, might be at the root of such an association, persisting up to now (Van Hiel et al 2016). Even if ethnocentric people tend to behave more rigidly than others, this is not an argument to equate rigidity and ethnocentrism as manifestations of personality. Ethnocentrism, conservatism, right wing political attitudes are related to a particular content of one's beliefs and attitudes, to specific perceptions of the social processes and groups, even when a particular type of structure of one's worldviews and beliefs is also implied. Conservatives are not necessarily dogmatic; even if conservatism as adopted social belief has been hardened by their dogmatism, these are different characteristics of the same individual. Dogmatism, as we have seen, covers persevering in one's beliefs (by seeing them as the only true beliefs), and sticking to the fixed organization of one's system of beliefs. Individual who embraces the New Age philosophy could be very rigid in his/her behaviour as left-wing followers could be very dogmatic in their ideologies. These are indeed different dimensions.

4. Neither *Need for Closure* nor *Need for Structure* (Schultz & Searleman 2002) are appropriate proxies for the measurement of personality manifestations of rigidity. Given the content of the rigidity construct, it is easy to understand why rigid people are expected to show preferences for order and structure (need for cognitive closure) or preference for cognitive simplicity and structure (personal need for structure), abhorring disorder and chaos. Rigidity describes how individuals deal with a particular life challenge – the necessity to change. A necessity we all encounter whatever our personal preferences in the cognitive realm. It is about unavoidable encounter, and as such it covers much larger area of life situ-

ations and behavioural responses than either of these individual – difference measures of cognitive needs.

Rigidity and Basic Dimensions of Personality

A discussion of the concept of rigidity would have been incomplete without elaboration of the relationships between the components of rigidity and the dimensions included in the most popular models of personality. This will be the last step in our conceptual analysis: after we have outlined the scope of the different manifestations of personality rigidity, and after we have differentiated them from related personality dimensions.

While first attempts weren't encouraging - Cattell (1946b) provided results about the correlation of disposition rigidity with his 12 personality factors which "do not arrive at a clear indication of any one factor" (Cattell 1946b: 248), and there is yet no much available data on the relation between measures of rigidity and the basic dimensions of personality, some tendencies can still be outlined. According to Eysenck and Eysenck (1962) Rigidity is a dysthymic trait, e.g. is correlated positively with Neuroticism and Introversion. The factor analysis of their data supported the expected relations: it identified rigidity as different from the factors of extraversion and neuroticism; the majority of rigidity items had negative loadings on the E factor and positive loadings on the N factor. In a study of the factorial structure of Eysenck's Personality Profiler (Jackson et al 2000), the primary scale of Dogmatism loaded about the same on factors labeled Neuroticism and Extraversion in a 3-factor solution, and on factors labeled Neuroticism and Agreeableness in a 5-factor solution.

A multitrait-multimethod study (Steinmetz et al 2011) used a measure based on Gough's scale and the questionnaire part of the Schaie's test to measure personality rigidity and to examine how it is related to openness to experience, and conscientiousness. Their results showed that both measures correlated negatively with Openness to experience and positively with Conscientiousness, derived from the NEO Five Factor Inventory by Costa and McCrae (1992).

Oreg (2003) correlated his resistance to change scale with Saucier's (1994) Big-Five Mini-Markers, and discovered that neuroticism and introversion are related to routine seeking, short-term focus and emotional reactions to change, as are risk aversion, intolerance of ambiguity, and sensation seeking. Openness to experience was only related to routine seeking, and cognitive rigidity didn't correlate with any of the big five dimensions. Di Fabio et al (2014) applied together Oreg's measure of resistance to change and Eysenck's Personality Questionnaire. Routine seeking and emotional reactions to imposed change exhibited small positive correlations with Neuroticism and small positive correlations with Extraversion. Similarly, cognitive rigidity didn't correlate with any of the Eysenck's personality dimensions.

The interesting work of Tellegen and his followers (Te Nijenhuis et al 2003) advocated the inclusion of rigidity as a third basic dimension of personality together with extraversion and neuroticism. He described rigidity as "a restriction in behavioral repertoire" and within this dimension he wanted to make a more refined classification into "rigids" and "dogmatics". Dogmatics were supposed to react more defensively to their environment, whereas rigids were supposed to react more preventively by trying to stabilize their environment. Empirical data didn't support this differentiation however. Factor analyses of Dutch personality questionnaires warranted the inclusion of Rigidity as a separate dimension, although some of the scales making up this factor have secondary loadings on the factor Neuroticism. These three dimensions make up a personality test IRP with seven scales: 1. Emotional Perseveration as manifested by difficulties in dismissing emotional experiences from one's mind (measures predominantly neuroticism and to a smaller degree introversion), 2. Dogmatism as manifested by holding on to ideals, intentions, and principles (measures predominantly rigidity and to a smaller degree neuroticism), 3. Order – striving for order, precision, and punctuality

(measures rigidity), 4. Achievement Orientation, 5. Social Adaptation – adaptive orientation towards the outside world, 6. Variation Need – exploratory orientation towards the outside world; (4, 5, 6 measure extraversion) and 7. Test Attitude – self-defensive versus self-critical test attitude indicative of social conformity (Te Nijenhuis et al 2003). In addition to relating rigidity and dogmatism, Dutch research showed the connection between rigidity and neuroticism and its independence from extraversion.

Another Dutch personality questionnaire, comprising rigidity as one of its seven dimensions, was correlated with the Big Five and Eysenck. The study of the relationships with the Five Factor Personality Inventory showed that rigidity correlated moderately with Conscientiousness and weakly with Intellect/Autonomy. In the joint factor analysis, Rigidity and Conscientiousness grouped on one factor - Factor II, with high positive loadings from Rigidity and Conscientiousness and a moderate loading from Agreeableness, which could be interpreted as conformity – nonconformity (Barelds & Luteijn 2002). In the study with EPQ, Rigidity was correlated positively with Neuroticism and Lie and negatively with Psychoticism. The joint factor analysis produced four factors. Rigidity had primary loading on the factor defined by equally high loadings of Psychoticism and Lie which apparently distinguished between ‘‘acceptable’’ and ‘‘non-acceptable’’ behavior, and was interpreted as conformity – nonconformity. (Barelds & Luteijn 2002). A third study administered all the three questionnaires to another community sample, and the results of this study were consistent with Studies 1 and 2. The second of the four emerged factors, had high primary loadings from Conscientiousness, Rigidity, Lie, Agreeableness and Psychoticism and was interpreted again as conformity – nonconformity factor.

These results encourage us to proceed with the analysis of the empirical data we have collected and examine the relationships between measures of personality rigidity and the basic dimensions of personality as identified by the Big Five factors and Eysenck’s model. We aim to demonstrate that the proposed differentiation between perseveration, rigidity and dogmatism as measures of rigidity in personality would be helpful in locating the dimensions of rigidity with respect to the current personality taxonomy.

Method

In the analysis of the empirical data we shall stand upon a) the above understanding of the scope and the content of the concept of rigidity in personality, and b) the theoretical framework provided by the Big Five model as taxonomy, dimensions and facets.

Measures of personality dimensions

Since the 80’s when the Big Five model was first introduced, it provides a systematic framework for distinguishing characteristics of individuals in a set of traits, which tend to occur together and share common elements (e.g. Costa & McCrae 1992; Goldberg 1992). Although the model is not a theory of personality, it implicitly adopts two of the basic views of trait theory: 1) that individuals can be characterized in terms of relatively enduring patterns of thoughts, feelings, and actions; 2) the traits can be quantitatively assessed (McCrae & John 1992). Despite the extensive research based on the model there is no single Big Five descriptions and measurement but there is an initial consensus on a general taxonomy of the personality traits of Agreeableness (A), Conscientiousness (C), Extraversion (E), Neuroticism (N, the opposite of Emotional Stability), and Openness to experience (O) or Intellect/Imagination (John et al 2008). These dimensions represent the various and diverse systems of personality description in a common framework including both lexically based research on simple and circumplex approaches of trait descriptive adjectives (e.g. Goldberg 1992) and questionnaire-based research on the personality traits (e.g. Costa & McCrae 1992). Thus, the Big Five structure does not imply that personality differences can be reduced to only five traits, but these dimensions represent personality at a very broad level of ab-

straction, as each dimension summarizes a large number of distinct, more specific and narrow personality characteristics.

The Extraversion factor includes at least five distinguishable components: activity level (active, energetic), dominance (assertive, forceful, bossy), sociability (outgoing, sociable, talkative), expressiveness (adventurous, outspoken, noisy, show-off), and positive emotionality (enthusiastic, spunky) (John et al 2008). These five components are similar to five of the six facets Costa and McCrae (1992) included in their definition of the Extraversion domain: activity, assertiveness, gregariousness, excitement-seeking, and positive emotions. The sixth Extraversion facet in Costa and McCrae's measurement –warmth/ affection is considered as a part of factor Agreeableness based on empirical loadings (see John et al 2008). In addition to warmth (affectionate, gentle, warm), Agreeableness covers themes such as tender-mindedness (sensitive, kind, soft-hearted, sympathetic), altruism (generous, helping, praising), and trust (trusting, forgiving), as contrasted with hostility, criticality, and distrust. Conscientiousness includes mainly domains as orderliness, reliability and industriousness. In Costa and McCrae's (1992) model it has again six facets: order, achieving striving, dutifulness, self-discipline, competence and deliberation. One of the most popular traits, Neuroticism, covers themes as insecurity (anxiety), emotionality (angry, hostility, depression) and irritability (impulsiveness). The fifth factor is one that raises questions about its definition and dimensions. The items that loaded substantially on this factor comprised both "open" characteristics (e.g., artistic, curious, original, wide interests) and "intellectual" characteristics (intelligent, insightful, sophisticated) (see for details John et al 2008). Goldberg (1992) interprets this factor's five clusters as intellectuality (intellectual, contemplative, meditative, philosophical, and introspective) and creativity (creative, imaginative, inventive, ingenious, innovative), while Costa and McCrae's (1992) facets of Openness are related to ideas, fantasy, and aesthetics. In moving away from a narrow Intellect interpretation, was suggested, which is somewhat closer to Openness and emphasizes the emerging consensus that fantasy, ideas, and aesthetics, rather than intelligence, are most central to this factor (Saucier 1992).

Different instruments measuring the traits in the Big Five model were developed; two of them are widely known. First, the NEO PI-R/FFI (Costa & McCrae 1992) which was translated and adapted in different cultural contexts, and second, a public domain pool of items called International Personality Item Pool (IPIP), based on Goldberg (1992) work. The research with the 50-item IPIP selection of Goldberg's (1992) markers for the Big-Five factor structure also yielded cross-cultural empirical evidence showing that the instrument is psychometrically sound (e.g. Constantinescu & Constantinescu 2016; Gow et al 2005; Zheng et al 2008). The associations between the two instruments are generally encouraging, as in the short form of the IPIP-NEO, and correlations range from 0.70 to 0.82 (see Gow et al 2005). However, it has been suggested that even such high correlations do not imply that the different versions are truly equivalent (Costa & McCrae 1999). The correlations between the IPIP scales Extraversion and Emotional Stability/Neuroticism, measured by scales in other personality questionnaires as EPQ-R (Eysenck Personality Questionnaire-Revised Short Form, EPQ-R, Eysenck et al 1985) were also high, 0.85 and 0.84 respectively (see Gow et al., 2005). These correlations of the IPIP Big-Five factor markers with the appropriate scales of the NEO-FFI and the EPQ-R, particularly high for N/ES, E and C, are accepted as evidence for the concurrent validity of the IPIP. With regard to Intellect and Openness, it is unsurprising that these factors are related to a smaller degree (Goldberg 1992), although still at 0.59. The IPIP Intellect factor seems more reliant on items assessing ideas and imagination, whilst NEO Openness items appear slightly broader in their scope, encompassing willingness to try new experiences (Gow et al 2005).

One of the great strengths of the Big Five taxonomy is that it can capture, at a

broad level of abstraction, the commonalities among most of the existing systems of personality traits, thus providing an integrative descriptive model for research (John et al 2008). First, almost every one of the theorists includes a dimension akin to Extraversion. Although the labels and exact definitions vary, nobody seems to doubt the fundamental importance of this dimension. The second almost universally accepted personality dimension is Emotional Stability, as contrasted with Neuroticism, Negative Emotionality, and Proneness to Anxiety. There is less agreement on the third dimension (C), which appears in various guises, such as Control, Constraint, Super-Ego Strength, or Work Orientation, as contrasted with Impulsivity, Psychoticism, or Play Orientation. The themes underlying most of these concepts comprise control or moderation of impulses in a normatively and socially appropriate way. Despite some psychometric problems of the remaining two factors in different cultural contexts, the need for a broad domain akin to Agreeableness, Warmth, or Love is still stressed. Similar arguments apply to the fifth and last factor included in the Big Five, referred to by the concepts of Creativity, Originality, and Cognitive Complexity which are measured by numerous questionnaire scales (see John et al 2008).

In the empirical studies that will be presented below, we used a Bulgarian form of the IPIP-50 (Goldberg 1999) in Study 1, and a Bulgarian form of the Eysenck Personality Questionnaire (Paspalanov & Shtetinski 1984) in Study 2. The measure of individual differences in personality rigidity that has been used in both studies is presented below.

Paspalanov's questionnaire for measuring personality rigidity (IP/PR-2)

The questionnaire for measuring personality rigidity (IP/PR-1), constructed by Ivan Paspalanov, consisted of 70 items, of whom 1 filler – the first introductory item. The other 69 items were compiled from three different sources. First, the 33 best working items from an earlier questionnaire on Perseveration, developed in collaboration with his MA student Ivan Igov; second, the 22 items of the Gough-Stanford Rigidity Scale (Rokeach 1960), and third, the 30-item Dogmatism Scale developed by Eysenck and Wilson (Eysenck, Wilson 1974). The theoretical rationale behind this compilation is the belief that rigidity in personality is a multidimensional construct that manifests itself as a resistance to change at different levels – in one's various activities, in the self-regulation of behavior, in attitudes and their organization. There were 56 indicative and 13 contra-indicative items, and a YES – CAN'T DECIDE – NO response format, borrowed from Gough, was used with them. An example of an item, indicative of rigidity, is "I always put on and take off my clothes in the same way", while items like "I easily adapt to new conditions of work and activities" are contra-indicative.

The IP/PR-1 questionnaire was administered to adults and university students. Based on data from three samples of university students and adults with different level of education, Stoycheva, Stetinski and Popova (2011, 2013, 2014) examined the psychometric characteristics of the original pool of 69 items and created a shorter, 38 -item measure (IP/PR-2) which is used in the present studies. It preserves the original answering format: yes – can't decide – no, which is actually scored as yes – no (can't decide is considered as another way to not say "yes").

The IP/PR-2 questionnaire yields four scores: three scores on factorially derived scales for Perseveration, Rigidity, Dogmatism, and a total score for Personality Rigidity (PRTS). Each of the factorial scales contains 10 items, and the total score is derived from all the 38 items. The 10 items in the **Perseveration** scale tell about how easy/difficult it is to get used to new conditions of activity, perform with different people or several activities simultaneously, and describe resistance to change in working tempo, daily working regime, established habits and the habitual settings. The items in the **Rigidity** scale speak about lack of flexibility – carefully thinking things through before acting, orderliness, sticking to a daily schedule, being methodical, following a life program, resisting change in plans. **Dogmatism** items emphasise hav-

ing clear, set, uncompromising views on most matters, and defending them vigorously, being forthright, (non) compromising with diversity in opinions, belief in the "tried-and-true" ways and in the only one right philosophy.

Cronbach's alphas in the three studied samples ranged from 0.71 to 0.79 for Perseveration, from 0.68 to 0.71 for Rigidity, from 0.65 to 0.70 for Dogmatism, and from 0.81 to 0.88 for the total score of Personality Rigidity. In addition to this very good internal consistency of the measures, questionnaire's scores showed also very good time stability. Sixty-three university students were re-tested in a 3-month interval, and coefficients of correlation of 0.58 for Dogmatism, 0.66 for Rigidity, 0.75 for Perseveration and 0.77 for the PR Total Sore, all significant at $p < 0.001$, were obtained, supporting the reliability of the instrument. Factorial scales are moderately correlated among themselves (coefficients from 0.21 to 0.37) and strongly correlated to the PR Total Score derived from the entire questionnaire (coefficients from 0.65 to 0.77). All reported correlations were significant at a level of $p < 0.001$.

Among university students and adults aged from 17 to 67, younger subjects scored lower on all scales, and subjects with higher education were characterized with lesser rigidity and dogmatism. There was an interaction between age and education: in older subjects the impact of education on dogmatism was not significant.

The validity studies are interesting to us as a source of information about the personality correlates of the examined measures of rigidity. A significant negative moderate to strong relationship between ambiguity tolerance scores and the measures of rigidity provided evidence for the convergent validity of the questionnaire's scores: more rigid people were less tolerant of ambiguity, and that was observed for all scales and for the overall score for personality rigidity. They also assigned greater importance to the avoidance of ambiguity as in ambiguity intolerant behaviours of certainty seeking, norm obliging and risk avoidance. Personality rigidity was not related to creative motivation (one's willingness to embark on the exploration of new possibilities, unusual ideas and uncommon pathways) neither to the importance assigned to ambiguity tolerant behaviours as valuing experimentation, not being afraid to take risks and try out new things, and welcoming non-traditional avenues. It correlated positively however with the need for achievement, i.e. the search for high standards of achievement in one's work or study.

Study 1

There were 150 respondents in the study, of whom 39 or 26% were men, and their age (Mean = 26, SD = 8) was in the range of 26 to 57 years. Participants were full time and part time psychology students at graduate and undergraduate level, enrolled in day-time or evening classes at Sofia University (N = 25), Plovdiv University (92), and New Bulgarian University (34).

Participants were administered Paspalanov's questionnaire for measuring personality rigidity (IP/PR-2), described above, and a Bulgarian form of the IPIP-50 during regular classes. IPIP-50 is a psychological instrument in the public domain, constructed to measure the Big Five dimensions of Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Intellect/Imagination. The item format is compact and short. According to preliminary data the 50-Item IPIP scales have good internal consistency, with Alpha Cronbach indexes ranging from 0.77 to 0.86 (Goldberg 1999). The Bulgarian form of IPIP-50 is a translation (Konstantin Cigularov) of the original. It uses a 5-point Likert-type response scale ranging from 1 (very inaccurate) to 5 (very accurate).

The results of the correlational data analyses - Pearson's correlations, are given in Table 1.

Rigidity measures produced internal consistency indexes showing acceptable to good reliability; the observed coefficients range from 0.60 to 0.80 and are very similar to the ones obtained in the normative sample (Stoycheva et al 2011). It should be noticed however that Rigidity and Dogmatism scales are somewhat less consistent in the present sample than they were in a larger, demographically more varied

Table 1
Descriptive Statistics for the Measures of Personality Rigidity, Big Five Dimensions and their intercorrelations

	PERS	RIG	DOGM	PRTS	ES	E	A	C	I
Perseveration	-								
Rigidity	.29***	-							
Dogmatism	.25**	.16*	-						
PR Total Score	.69***	.68***	.67***	-					
Emotional Stability	-.50*** (-.46***)	-.15* (-.02)	-.18* (-.07)	-.38***	-				
Extraversion	-.41*** (-.39***)	-.23** (-.15)	.02 (-.16)	-.28***	.23**	-			
Agreeableness	-.08 (-.08)	.07 (.11)	-.06 (-.06)	.02	-.02	.24**	-		
Conscientiousness	-.08 (-.24**)	.45*** (.48***)	.06 (.05)	.21*	.19*	-.002	.25***	-	
Intellect/ Imagination	-.22** (-.18**)	-.11 (-.04)	-.13 (-.08)	-.19*	.18*	.29***	.27***	.19**	-
M	2.82	5.93	3.69	16.40	30.74	33.59	41.39	36.13	39.12
SD	2.44	2.26	2.21	6.08	8.93	7.49	5.44	6.51	5.41
Cronbach's alpha	0.75	0.62	0.66	0.81	0.90	0.85	0.82	0.79	0.80

*** - $p < 0.001$; ** - $p < 0.01$; * - $p < 0.05$

In parenthesis: partial correlations of each of the IP/PR-2 scales with the Big Five dimensions, controlling for the other two of the IP/PR-2 scales

normative sample. Big Five dimensions also show good internal consistency, all coefficients are above 0.70 up to 0.90.

IP/PR-2 scales are significantly, but weakly intercorrelated, in the range of 0.21 to 0.37; and their comparable moderate correlations with the total score (0.64 – 0.71) showing that they are quite well weighted in their contribution to the overall assessment of personality rigidity (Stoycheva et al 2013). In the present study similar intercorrelations were found. The weak (0.16 – 0.29) statistically significant correlation coefficients between the IP/PR-2 scales support the understanding that they measure specific, albeit interrelated, components of personality rigidity.

In order to account for scales' interrelatedness and obtain a better estimate of their true relation to the Big Five dimensions, partial correlations of the IP/PR-2 measures with the Big Five dimensions were also computed.

Correlations between the Big Five dimensions and the measures of Personality Rigidity showed that:

a) Emotional Stability has negative medium correlation with Perseveration and negative medium correlation with Total PR Score (PRTS); the relation of Emotional Stability to Perseveration also appears to account for the weak zero-order correlations of Emotional Stability to Rigidity and Dogmatism;
b) Extraversion has negative medium correlation with Perseveration and a negative small correlation with Total PR Score; similarly, its correlation to Perseveration appears to account for its weak zero-order correlation to Rigidity;
c) Conscientiousness has medium positive correlation with Rigidity and a small positive correlation with Total PR Score; its correlation to rigidity appears to unravel a un-

derlying small negative partial correlation of Conscientiousness with Perseveration;

d) Intellect has small negative correlation with Perseveration and a small negative correlation with Total PR Score;
e) Agreeableness showed no relation at all with the personality rigidity measures.

With respect to the measures of personality rigidity, these results can be summarised as follows:

People with high scores on Perseveration, who find it difficult to alter their routines, tend to be also with low Extraversion, low Emotional Stability, low Conscientiousness, and somewhat smaller scores on Intellect/ Imagination. It seems that the perseverative tendency is putting these individuals on the introverted and conservative side, since entering social settings, interpersonal exchange, new situations and self-control of impulses would ask them to confront demands they are not well enough equipped to meet.

Those who score high on the Rigidity scale – people who rely on careful planning, orderliness, being methodical, sticking to schedules, and following programs – tend to be also conscientious. On the other hand, an analysis of the content of items in the Conscientiousness scale of the IPIP-50 reveals that they are related to orderliness and to self- discipline. Donnellan et al (2006) reported data for the coverage of NEO Facets by 3 measures of the Big Five factors. The biggest correlations of the Conscientiousness scale of the IPIP-50 were with the facets Order and Self-Discipline (Donnellan et al 2006: 196). Also, John et al. (2008) described how well three other Big Five Scales represent the six NEO-PI-R Facets. It was evident that Order and Self-Discipline are the two dominating facets for Conscientiousness domain, the other four being more peripheral (John et al 2008: 137).

As to the Dogmatism scale, its scores didn't show any consistent significant effect in relation to the Big Five dimensions. The small negative zero-order correlation was reduced to non-significance when the shared variance between the PR scales was partialled out.

The Total PR score, based on the 38 items and capturing a broad array of manifestations of personality rigidity at different levels, showed relevant pattern of relation to the Big Five: people showing high levels of personality rigidity would be found among those who are emotionally unstable, more introverted, conscientious, and without imagination and open intellect.

In order to further verify the results of the correlational analyses, a joint Principal Component Analysis was conducted on the (IP/ PR-2) scales and the IPIP-50 measures. Given expected correlations between them, a Promax rotation was used. Eigen values over 0.1 and the scree plot pointed to a three-factor solution with good structure and no substantial cross-factor loadings. The explained variance was 63.39. The outcomes of the analysis are listed in Table 2.

Table 2
Factor loadings of the Pattern Matrix of the IP/PR-2 scales and the IPIP-50 measures

Components	1	2	3
Emotional Stability	-0.88	-0.08	0.21
Perseveration	0.73	-0.18	0.10
Dogmatism	0.55	0.16	0.07
Agreeableness	0.29	0.80	0.21
Extraversion	-0.07	0.71	-0.27
Intellect / Imagination	-0.09	0.66	0.08
Conscientiousness	-0.22	0.18	0.87
Rigidity	0.17	-0.14	0.80

The first factor is defined by the high negative loading from Emotional Stability and high positive loadings from Perseveration and Dogmatism. It denotes the association between high neuroticism, perseveration and dogmatism, found in our sample. Factor II is marked by high positive loadings from Agreeableness, Intellect and Extraversion. No scale from the personality rigidity questionnaire has substantial loading on this factor. It denotes associated domains of personality manifestations which are unrelated to personality rigidity. Factor III is characterized by high positive loadings from Rigidity and Conscientiousness. Factors I and III are moderately correlated (-0.35), but are not related to Factor II (0.15 and 0.01 respectively).

The results of the factors analysis both confirm correlational data and further specify the pattern of relations between the measures of personality rigidity and the big five dimensions of personality. First, there is association between emotional instability and perseveration, where dogmatism finds its place as well. This finding suggests that there is association between emotional and behavioural perseveration, and that dogmatism is associated with them. On the other hand, there is an association between conscientiousness and rigidity. These two dimensions share orderliness as personality characteristic and their association suggests that ego-control of impulses might be a common core for reliability and rigidity.

The second factor outlines personality manifestations that are unrelated to personality rigidity. Agreeableness showed no relation at all with the dimensions of personality rigidity. The fact that Extroversion loaded on this factor could point to some confounding between the effects of emotional stability and extraversion in their relations to personality rigidity measures. When bivariate relations were examined, results for extraversion equaled those for emotional stability. When all the dimensions were treated together in the single space of individual differences, defined by these two tests, it is the association between neuroticism and perseveration that survived. Similarly, the weak association between Intellect/Imagination and perseveration has also evaded.

Similar Principal Component Analysis was carried out with the total score derived from the PR questionnaire. Eigen values over 0.1 and the scree plot pointed to a three-factor solution. The explained variance was 71.12. Pattern matrix loadings after Promax rotation are shown in Table 3. The correlations between factors are: Factors I and II – 0.25, Factor II and Factor III – (- 0.18), Factor I and Factor III are unrelated (0.004).

This analysis confirms the findings for the individual scales: personality rigidity has substantial primary loading on a factor defined by emotional stability, and a small secondary loading on a factor defined by conscientiousness. The overall consistency in the revealed patterns of relationships across methods of analysis supports the use of the IP/PR-2 total score as a measure of individual differences in personality rigidity, and strengthens the conclusion about its primary association

Table 3
Factor loadings of the Pattern Matrix of the IP/PR-2 Total Score and the IPIP-50 measures

Components	1	2	3
Agreeableness	.82	-.33	.19
Extraversion	.66	.20	-.25
Intellect / Imagination	.63	.19	.21
Emotional Stability	-.11	.94	.34
PR Total Score	-.15	-.65	.37
Conscientiousness	.13	.14	.93

with neuroticism and secondary association with conscientiousness within the conceptual space of personality manifestations defined by the big five factors.

Study 2

The study was carried out by Joana Ilieva in partial fulfillment of the requirements for a BA degree in Psychology at the New Bulgarian University (Ilieva 2018). Sixty people, ranging in age from 20 to 60 years (M = 31, SD = 8), took part in the study; of them 30 were men. Paspalanov's questionnaire for measuring personality rigidity (IP/PR-2; Stoycheva et al., 2014) and Eysenck Personality Questionnaire (EPQ; Paspalanov & Shtetinski 1984) were administered. The Bulgarian form of EPQ contains 86 items and 4 Scales: Extraversion (20), Neuroticism (23), Psychoticism (24) and Lie/Social Desirability (19) with good internal consistency, with Cronbach alphas ranging from 0.68 to 0.84 (Paspalanov & Shtetinski 1984).

The two questionnaires with their standard instructions were made available online on the "Google forms" platform, to be filled in anonymously. The link to the survey in Google forms has been distributed via the personal Facebook page of Yoana Ilieva (Ilieva 2018). Invitation to join the study has been sent to her direct contacts who were also asked to refer the study to their own contacts (snowball technique). The survey began in February 2017 and ended in March 2017. In reaching accessible units of the general population, the gathering of the sample was guided by the goal of getting an equal number of male and female participants within the specified age interval.

The results of the correlational analyses are given in Table 4. Personality Rigidity measures show acceptable internal consistency; the coefficients range from 0.67 to 0.78, apart from the Rigidity scale whose internal consistency (0.50) is lower than in Study 1 and in the previous studies with university

Table 4
Descriptive Statistics for the Measures of Personality Rigidity, Eysenck's Personality Dimensions, and their intercorrelations

	PERS	RIG	DOGM	PRTS	N	E	P	L
Perseveration	-							
Rigidity	.09	-						
Dogmatism	-0.003	.35**	-					
Total Score (PRTS)	.57***	.68***	.66***	-				
Neuroticism	.39**	.09 (.09)	.01 (.02)	.26*	-			
Extraversion	-.48***	.14 (.06)	.25 (.21)	-.05	-.30*	-		
Psychoticism	.19	-.36** (-.43***)	.12 (.28*)	-.04	.16	0	-	
Lie	-.14	.29* (.20)	.30* (.22)	.20	-.35**	.30*	-.32*	-
M	3.35	6.07	4.48	17.6	11.15	13.20	3.27	6.70
SD	2.65	1.99	2.25	5.68	5.60	3.92	2.90	3.30
Cronbach's alpha	0.78	0.50	0.67	0.77	0.87	0.78	0.71	0.70

*** - $p < 0.001$; ** - $p < 0.01$; * - $p < 0.05$

In parenthesis: partial correlations of Rigidity and Dogmatism scales with the Big Five dimensions, controlling for the other one.

students and adults (Stoycheva et al 2011). EPQ scales show good internal consistency, comparable with the data from its Bulgarian adaptation: alpha coefficients for this study are in the range of 0.70 to 0.87.

Pearson's correlations of Perseveration, Rigidity and Dogmatism with the Total Score for Personality Rigidity (PRTS) vary from 0.57 to 0.68 and are similar to those in Study 1 and in the reference samples (Stoycheva et al 2013). As to the intercorrelations between the three scales, only the correlation between Rigidity and Dogmatism is significant. In this sample Perseveration scores are unrelated to the scores on the two other IP/PR-2 scales. By analogy to Study 1, in order to account for scales' interrelatedness and obtain a better estimate of their true relation to the Big Five dimensions, partial correlations of Rigidity and Dogmatism with the Big Five dimensions were also computed; they appear in Table 4 too.

Correlations between the Eysenck's dimensions and the Personality Rigidity measures showed that:

a) Neuroticism has medium positive correlation with Perseveration and a small positive correlation with the Total PR score;
b) Extraversion has medium negative correlation with Perseveration;
c) Psychoticism has medium negative correlation with Rigidity and a small positive correlation with Dogmatism; the latter appeared as partial correlation, i.e. after the influence of the interrelation between Rigidity and Dogmatism was taken out;
d) Lie has medium positive relation with Rigidity and with Dogmatism which are reduced to non-significance when the relation between the two measures of personality rigidity is taken into account.

With respect to the measures of personality rigidity, these results can be summarised as follows:

People high in Perseveration tend to be also with low Extraversion and high Neuroticism (or low Emotional Stability), as it has also emerged in Study 1. According to Eysenck (Eysenck & Eysenck 1962: 180) extraverted people are characterized by strong, quickly developing and slowly dissipating cortical inhibition and satiation which cuts short ongoing perceptual, cognitive and motor activities. So, the perseverance of such activities beyond the normal should be characteristic of introverted people. As to the relation with Neuroticism, he relates it to the strength of the drive which prevents adaptive changes in behaviour by strengthening existing habits (Eysenck & Eysenck 1962: 181).

People high in Rigidity tend to be also low in Psychoticism, i.e. exhibited almost no asocial features and are rather characterized by an acceptance of social norms and prosocial behaviours.

People high in Dogmatism were willing to endorse socially desirable behaviours while actually reporting greater psychoticism in their self-descriptions.

Unlike the results of Study 1, in the current study the Total PR Score, based on all the 38 items in the questionnaire, showed significant relation with only one of the Eysenck's personality dimensions – Neuroticism.

General discussion

Two empirical studies with Bulgarian adults provided data for the analysis of the relationships between the dimensions of personality rigidity as perseveration, rigidity, and dogmatism, and the measures of basic personality dimensions as IPIP-50 and Eysenck's personality questionnaire. Across the two studies, two sets of findings were replicated.

First, Perseveration was negatively related to Extraversion and Emotional Stability. Both our findings and those reported elsewhere (Te Nijenhuis et al 2003) suggest that the relation with Neuroticism is the more persistent one. The experience of anxiety may by the common element between Perseveration and Emotional instability. Also, emotional perseveration indicating difficulties in dismissing emotional experiences from one's mind (Te Nijenhuis et al 2003) might be at the core of this relation. Disposition to experience prolonged emotional reactions once elicited (emotional perseveration) was found to be different from increased probability to experience negative or positive affect (emotional

reactivity) and to account for unique variance in the traits of negative and positive affectivity (Boyes et al 2017). Strelau and Zawadzki (2011) also studied emotional perseveration (the tendency to continue and repeat emotional states) as a temperamental trait, and found that it loaded on the Neuroticism factor of the Big Five model both in self-reports and in peer-ratings.

Preference for low levels of stimulation, associated with resistance to change, could play a role too (Oreg 2003), and extraversion may be related to resistance to change through the mediation of its link to sensation seeking. It is also worth remembering that Cattell (Cattell & Tiner 1949: 339) has characterized perseveration through an "ideational inertia" shown in inability to break with perceptual habits and with habits of thinking. It is possible that this lack of plasticity is associated with fatigue, lack of "play" energy, or basically restricted mental energy. Low scores on symbolic ideation, represented by the Intellect/Imagination factor, for high perseveration subjects, add some support to the above suggestion.

Second, Rigidity was negatively related with Psychoticism and positively with Conscientiousness. Our findings have their parallels in the psychological literature (Barelds & Luteijn 2002). Barelds & Luteijn (2002) also proposed an explanation for this association - the conformity/non conformity dimension, implying that higher rigidity in personality is associated with greater conformity. Given that order and self-discipline are at the heart of Conscientiousness in the present form of IPIP, and that Psychoticism is associated with the function of the Superego, it is also possible that this association reveals rigid self-control. Strictly keeping oneself within a set behavioral program and methodically adhering to its realization would be characteristic of these individuals.

Conclusion

Integration of our understanding of rigidity

The absence of a well-defined theoretical framework, and the lack of consensus about how rigidity should be measured are often considered as an obstacle in research on personality rigidity. Our paper addresses the first part of the problem – it examined the various manifestations of rigidity in order to define the scope and the content of this construct. Our exploration has begun with an analysis of the psychological construct of rigidity and then proceeded to a differentiation between rigidity and related concepts. This analysis has specified personality rigidity as encompassing perseveration, rigidity, and dogmatism which indicate different aspects of resistance to change in one's habitual actions, organisation of behaviour, and systems of views. It also differentiated personality rigidity from related concepts and similar manifestations of personality. What's particularly new about our analysis?

To begin with, unlike recent meta-analyses (e.g. Van Hiel et al 2016), focusing on methodological issues, we focused on the scope and content of rigidity as a personality characteristic. In response to the question "How is rigidity manifested as an individual difference disposition?" we could figure out different ways of resisting change - perseveration in habitual actions, rigidity in daily routines and life plans, and dogmatism in defending established views and opinions – that have composed the conceptual space of rigidity and were covered by its most popular measurement instruments. Second, while building upon previous research and discussion of psychological rigidity, we actually moved away from this line of work in one more way. We abandoned task - and domain - specific view of the multidimensional nature of rigidity, as in studies of cognitive rigidity or motor perseveration. Instead, we distinguished different manifestations of resistance to change that are composing one's personality rigidity: perseverating in one's action, preventing change via sticking to established order, and sticking to set beliefs and views. All three dimensions fit with the generalisation proposed by Schultz and Searleman (2002): the two steps in the rigidity process: set formation and set perseveration which are positively correlated such that a person who quickly forms a set is likely to perseverate in its use, and consistent in that a person who quickly forms a mental

set would also quickly form a behavioral set. They also align with earlier differentiation between structural rigidity (tendency to develop a set) and functional rigidity (the tendency to persevere in the use of a set).

Although both structural and functional rigidity indicate restrictedness in behavioural options, and therefore point to low flexibility understood as adaptive variability in one's behaviour, the measurement of personality rigidity is based on indicators of resistance to change. Consideration of rigidity – flexibility as the poles of a single dimension is not warranted by our analysis and its conclusions.

We were also able to show how this differentiation helps to understand the relation of rigidity to basic dimensions of personality, and integrate previously disparate findings. The correlations of the components of personality rigidity with the basic dimensions of personality defined by the Big Five model and Eysenck's PEN model were examined. The data from two empirical studies with Bulgarian subjects were consistent with the results obtained elsewhere. Perseveration appears to be related to two basic dimensions of personality – extraversion and neuroticism, in that persevering tendency is blocking sociability and activity, and is associated with anxiety and difficult emotional regulation. It is neuroticism that loads on the same factor with perseveration, however, and dogmatism also finds its place on the side of neuroticism. On the other hand, rigidity revealed its connection with conscientiousness, orderliness and self-discipline.

Both conceptual and empirical analyses supported the differentiation between the manifestations of rigidity in personality. Perseveration, rigidity and dogmatism were separated by several authors and research programs in a consistent way, and they also exhibited different pattern of relationships with the basic dimensions of personality in empirical studies.

Research areas in the study of rigidity that weren't covered

In the research literature there has been a special focus on the relations of rigidity with age, but this topic in itself is beyond the limits of the present study. It is important to mention however that Lapsley and Enright (1983) believed the problems in the developmental interpretation of rigidity and in the definition of the concept are linked. The problem of definition seems to be occurring because there is no one theory that accounts for the nature of the construct (as cognitive, behavioural or as both) or the mechanisms perpetuating it. They proposed to consider rigidity as a cognitive development construct what would mean rigidity may have a different nature at the different developmental periods. For example, rigidity in older adults may have different causes in comparisons with rigidity in youth, and different mechanisms may characterize rigid behavior, or there could be a perseverative process unique in the elderly. This point of view has a special consequence for our topic as it implies that reliability of the rigidity measures and findings in cross-sectional studies may be influenced by the developmental nature of the construct itself (Lapsley & Enright 1983).

Clinical studies of rigidity are also not considered in our analysis. We focused on rigidity and its manifestations as normal characteristics of individual behaviour. We do not equate personality rigidity with the inflexibility of the disordered personality, and samples we have examined are drawn from the general populations. When faced with changed circumstances, perseverating in one's old ways is maladaptive, but it is not maladaptiveness that defines rigidity. As we see in the following definition, it is the perseverance in maladaptive patterns of behaviours that is used to define personality disorders: "Individuals with PDs consistently display unusual and restricted patterns of maladaptive thoughts, feelings, and behaviors. The perseverance of these patterns limits the individual's ability to deal with stress, is often problematic for other people, and impairs social or occupational functioning". (O'Connor and Dyce 2001: 1119).

We also consider that conceptual definition of rigidity is best separated from the value that society assigns to different types of behaviour. This actually constitute an interesting line of

investigations – to what extent rigid behaviour is valued or not within a given culture? Or for people of different age and education? It may appear that a hidden evaluative dimension is intervening in the clarification of psychological understanding of personality rigidity.

Future research

Our paper has come across important methodological issues which need further exploration. The relative value of the scales' scores and of the total score derived from the Bulgarian questionnaire for measuring personality rigidity would be one of them. Are relations between perseveration, rigidity and dogmatism similar across populations, and if not, to what characteristics of the populations could the emergence of dissimilarity be related? What's the relative value of the scales' scores and of the total score?

Another interesting direction for future research would be the study of determinants of personality rigidity and its manifestations. Though regression in old age may be due to degeneration of cognitive structures, even a cognitive developmental view of rigidity does not limit its causes to intrinsic processes (Lapsley & Enright 1983). Cultural and/or experiential factors may contribute too to changes in rigidity – by minimizing or not interpersonal conflict, exposure to different viewpoints, offering or denying opportunities for role-taking experiences, and being in a homogeneous or diverse environment. It would of interest to examine whether different components of rigidity relate differently to environmental influences and life experiences.

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