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“When I look back at those memorable days in NIAS, I cannot really say what has been more important for my future – either the provided possibility to immerse myself in the psychological literature on ambiguity tolerance and creativity, to indulge in reading and thinking, or the received support, attention, care, respect and recognition for the valuable work we were doing.”

Her research on creativity and personality focuses on ambiguity tolerance, creative motivation and creative personality, creative problem solving and decision-making, and measurement of creativity. Her work was supported by TRIS Fellowship from NIAS (1995), Young Investigators Grant from Jacobs Foundation (1996), NATO Scientific Research Fellowship (2001), and a scientific exchange grant from Jacobs Foundation (2002). In 2003 her monograph on ambiguity tolerance appeared, and in 2008 she was invited to present a symposium on ambiguity tolerance and creativity at the International Congress of Psychology. Her other interests involve cultural studies, interdisciplinary art and science, popularisation of psychology, and tolerance and human rights. Katya Stoycheva currently teaches Creativity and Personality and Social Ecology of Creativity at the New Bulgarian University.

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Intolerance, Uncertainty, and Individual Behaviour in Ambiguous Situations

*A man goes to knowledge as he goes to war,
wide awake, with fear, with respect,
and with absolute assurance.*

Carlos Castaneda

Encounters with ambiguity are inherent to human life. At work and in everyday life, in interpersonal communication and in our interactions with social groups and institutions we have to act with a lack of clarity due to either a lack of information or a lack of coherence in the available information. Imprecise concepts, missing information, unclear performance criteria and uncertain outcomes challenge us in solving problems. Communication may be ambiguous due to multiple meanings of the words or inconsistency between verbal and non-verbal parts of a discourse. Social role may be ambiguous due to contradictory or fragmented interpersonal relationships. In a wide range of settings people meet with vague or inconsistent stimuli and situations that cannot be clearly defined or easily understood.

Psychological science uses the notion of *ambiguity tolerance* to describe individual behaviour in ambiguous situations (Stoycheva 2003). How people experience an ambiguous situation and what they do in such a situation is indicative of their *tolerance/intolerance of ambiguity*. Tolerance with regard to ambiguity refers to an attitude of acceptance similar to, for example, drug tolerance or political tolerance. It indicates the capacity to “live with” ambiguity, endure ambiguity, to operate with and within ambiguity. Tolerance is usually contrasted with intolerance of ambiguity on the continuum of individual

differences in ambiguity tolerance, denoting how well people cope with ambiguous situations from avoidance to acceptance to dealing with ambiguity.

People who are *intolerant of ambiguity (AIInT)* perceive and interpret ambiguous situations as a source of psychological discomfort or a threat and tend to avoid them either psychologically (by ignoring ambiguity) or operationally (by leaving the situation). Those who are *tolerant of ambiguity (AT)* are better able to meet the challenge: they can withstand the discomfort of an ambiguous situation long enough to accommodate and generate more appropriate and flexible responses to it.

From the study of the authoritarian personality to the understanding of human behaviour in ambiguous situations

The study of ambiguity tolerance has its roots in the research on the authoritarian personality after World War II (Adorno et al. 1950). The work of Else Frenkel-Brunswik stimulated in particular the investigation of intolerance of emotional and cognitive ambiguity in relation to authoritarianism. Inability to accept and deal with ambivalence in one's attitudes towards the figures of authority, and the concomitant anxiety which is not openly faced or admitted, characterized the group of high scorers on ethnocentrism, as well as a black-and-white thinking in terms of dichotomies and opposites. Milton Rokeach and Hans Eysenck further stressed the association between intolerance of ambiguity and a particular type of belief systems characterised by close-mindedness, dogmatism, rigid adherence to convention and stereotypes (Stoycheva 2003).

The first psychological instruments designed to measure individual differences in ambiguity tolerance (see Table 1) were inspired by these lines of work and were identifying *intolerance of ambiguity* through the type and content of one's beliefs, attitudes, and opinions ("Women are either bad or good", "Parents nearly always know best", "It is always better to have a definite course of action than to be vacillating among several possibilities", "The sooner we all acquire similar values

and ideals the better”) and through personality dispositions revealing rigidity and preconceived mental set (“I don’t like changing my routine”, “I make up my mind very rapidly”, Stoycheva 2003).

Table 1. Measures of Ambiguity Tolerance and the Content of Their Items

Measures	AlnT items	AT items	AlnT – AT behaviours	Traits	Attitudes
Walk’s Ambiguity Intolerance Scale (O’Connor, 1952)	5	3	–	–	8
Coulter’s Intolerance of Ambiguity Scale (Eysenk, 1954)	14	–	6	3	5
Intolerance of Ambiguity Scale (Martin and Westie, 1959)	8	–	–	–	8
Intolerance of Ambiguity Scale (Budner, 1962)	8	8	2	–	14
AT-20 Scale for Ambiguity Tolerance (MacDonald, 1970)	15	5	13	–	7
Measure of Ambiguity Tolerance (Norton, 1975)	54	7	48	3	10
Measure of Tolerance for Ambiguity (McLain, 1993)	12	10	19	–	3

Subsequent research analysed the relation of ambiguity tolerance to other personality traits and processes, to individual behaviour in different areas of life and to human development in the life span. An increased understanding of human behaviour in ambiguous situations resulted in the development of new types of ambiguity tolerance measures that were composed mostly of behavioural items, i.e. self-reports of the frequency and intensity of one’s reactions of tolerance/intolerance across variety of ambiguous situations. These instruments aim at identifying *individual differences in ambiguity tolerance* and sample both tolerance (“I enjoy an occasional surprise”, “I tend to like obscure or hidden symbolism”) and intolerance of ambiguity (“I always want

to know in advance who will be at the party”, “If I am uncertain about the responsibilities of a job, I get very anxious”, “I prefer familiar situations to new ones”, Stoycheva 2003).

Experiencing difficulties in the face of ambiguous situations, events and ideas appears to be at the core of tolerance/intolerance of ambiguity. In a cross cultural study French and Bulgarian judges rated 188 personality traits, attitudes and behaviours with respect to their relatedness to the ambiguity tolerance construct. Of the 46 items at the strongest level of relatedness, 42 items describe discomfort and frustration with the lack of clarity in ambiguous situations or with the unpredictability of events and people’s behaviour; an inability to act in ambiguous situations; the avoidance of ambiguity in one’s understanding of a situation, event or idea, and the avoidance of the encounter with ambiguity. The other four items describe positive experience of enjoyment in uncertain or ambiguous situations, and a preference for exploration (Stoycheva, Lubart, Zenasni & Popova 2008).

The relation of ambiguity tolerance to the *subjective experience of uncertainty* was empirically demonstrated as well, through the observed correlation of intolerance of ambiguity with anxiety and intolerance of uncertainty (Stoycheva 2009) on the one hand, and the positive association between tolerance for ambiguity and openness for experience (Zenasni & Lubart 2001) on the other. A questionnaire study of high school students’ attitudes towards mobility (Dette & Dalbert 2005), for example, found uncertainty tolerant adolescents more willing to relocate when offered incentives (e.g., promotion). The positive connection of tolerance for ambiguity with the intrinsically motivated exploration of novel, unusual or complex stimuli and situations was further supported by its correlation with creative motivation across different samples of high school students, university students and adults (Stoycheva 2008).

Tolerance for ambiguity and creativity: constructing possibilities

Research on ambiguity tolerance and creativity implies that tolerance for ambiguity builds upon creative thinking and problem solving. Thus adolescents who were tolerant of ambiguity outperformed those who

were intolerant of ambiguity on both verbal and non-verbal creative thinking tasks (Stoycheva 2003). Ambiguity tolerant students didn't generate more solutions to the open-ended verbal tasks, but they were able to generate more original, unusual ideas and solutions. Similarly, in a study of French adolescents and their parents, tolerant for ambiguity participants generated more unique solutions to a verbal divergent thinking task (Zenasni, Besançon & Lubart 2008). Getting away from the obvious and the commonplace habit-bound thinking seems to strengthen one's capacity to deal with ambiguous situations where the true and tried ways of doing do not work.

Tolerant for ambiguity students also provided more inventive, imaginative and abstract but appropriate titles to their pictures – titles that captured the essence in an imaginative manner. These titles implied something more than could be seen, suggesting a special meaning, telling a story or symbolizing the picture. Tolerance for ambiguity was associated with the capacity to create symbolic bridges between what is and what could be.

Another study examined the impact of problem redefinition on the generation of creative solutions to the problem (Stoycheva 2009). Groups of students in business administration were asked to generate original and effective solutions to real-life problems. Four professional psychologists rated their problem redefinitions for breadth and generalisation, and four experienced managers rated the creativity of the proposed solutions to the problems. Students who were high in tolerance of ambiguity provided problem redefinitions that were judged as more broad and generalised. Also, the mean creativity score of their solutions to the redefined problem was higher than the mean creativity score of their solutions to the non-redefined problem. Tolerant for ambiguity subjects didn't generate more solutions to the redefined problems but generated more creative solutions. Their gain in creativity didn't necessitate gain in productivity but was related to putting the problem in a broader context and opening it up to a wide range of associations.

These findings suggest that tolerance for ambiguity builds upon an individual's capacities to redefine problems and generate creative solutions to the problems. In an ambiguous situation, when people feel

overwhelmed by the “mess” of confused and complicated information, it is the quality, not the quantity of ideas that matters. Pursuing ideas in depth and in scope, (re)creating life experiences in a symbolical way and originating novel possibilities enable one’s encounters with ambiguity.

Tolerance/intolerance of ambiguity: perceived importance and encouragement

How much people value ambiguity tolerance or intolerance will impact their behaviour in ambiguous situations as well: personal values have been found to be associated with a large variety of behaviours and behavioural intentions (Roccas, Sagiv 2010). As desirable goals that guide one’s behaviour directly or indirectly, values affect the way people act, their choices and decisions, as well as their evaluations and interpretations.

In order to assess attitudes towards ambiguity tolerant and ambiguity intolerant behaviours, we designed an original psychological instrument, consisting of 7 ambiguity tolerant and 7 ambiguity intolerant behaviours that are thematically related and have a similar moderate degree of social desirability (see Table 2). The scale was constructed for a concurrent study of high school students, their parents, and teachers that examined the development of ambiguity tolerance in adolescents. Parents and teachers were given the scale with the instruction to indicate how often they encourage these behaviours within their family or with their pupils, and high school students were asked to indicate how important these behaviours are for them (Stoycheva 2003).

Both ambiguity tolerant and ambiguity intolerant behaviours were valued by adolescents and positively perceived and encouraged by teachers and parents. If certainty seeking, norm obliging and risk avoidance are desirable personal outcomes, so are experimentation, putting one’s abilities to test and exploration of novel and uncertain situations. The conflicting motivational implications of these evaluations seem to be resolved through a preference for ambiguity tolerant over intolerant behaviours in adolescents and in their teachers, and a preference for ambiguity intolerant over tolerant behaviours in adolescents’ parents.

Table 2. Ambiguity Tolerant and Ambiguity Intolerant Behaviours

Ambiguity Tolerance	Puts him/her self to the test by experimenting in different situations.
	Enjoys unexpected situations and surprises.
	Prefers situations with no strict rules and no prescribed ways of doing things.
	Apt for a non-traditional profession.
	Puts to test his/her abilities with complex tasks which he/she might not manage to solve.
	Willing to participate in new endeavours and to take risks.
	He/she is rather original and non-traditional in his/her tastes and preferences.
Ambiguity Intolerance	Prefers well established aesthetic values.
	Holds definite opinions and judgements about most things.
	Chooses situations with clear chances for success.
	Avoids risks.
	Strictly follows the norms and the rules set at home and at school.
	Prefers to be on the safe side.
	Prefers the well known certain things.

Preferences for ambiguity intolerant (but not for ambiguity tolerant) behaviours depended upon demographic factors like age, education and settlement: younger adolescents, parents with secondary education and those living in a small town appreciated intolerance of ambiguity more (Stoycheva 2003). The importance that individuals assign to the avoidance of ambiguity is, in part, related to one's social situation, which is not the case as far as the subjective importance of dealing with ambiguity is concerned.

Individual disposition towards tolerance/intolerance of ambiguity showed connection with the importance assigned to ambiguity intolerant behaviours: ambiguity tolerance scores correlated with attitudes towards ambiguity intolerant behaviours but were not related to attitudes towards ambiguity tolerant behaviours. Ambiguity intolerant behaviours were less desirable and attractive to adolescents who were

more tolerant of ambiguity. This finding was replicated across gender and age in the Bulgarian sample as well as in a comparable sample of French adolescents (Stoycheva 2003). Adolescents' tolerance for ambiguity was related to a relative freedom from internal pressures to be on the safe side and follow the established ways.

On the other hand, attitudes towards ambiguity tolerant and ambiguity intolerant behaviours were inversely related in the two groups that showed preference for tolerance of ambiguity. Adolescents and their teachers who assigned less importance to ambiguity intolerant behaviours also assigned more importance to ambiguity tolerant behaviours. "Freedom from" the well known and the certain thus entailed "freedom for" exploration and experimentation.

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