

MOTIVATIONAL ASPECTS OF CREATIVITY IN STUDENTS AND ARCHITECTS: IMPLICATIONS FOR EDUCATION

Hernan **CASAKIN**¹ and Shulamith **KREITLER**²

¹Ariel University Center of Samaria, Department of Architecture

²Tel Aviv University, Department of Psychology

ABSTRACT

The research was concerned with the study of motivation for creativity. The goal was to assess motivation for creativity in design students based on the Cognitive Orientation theory which defines motivation as a function of a set of themes identified as relevant for creativity. It was expected to find differences in the scores of the themes between more creative and less creative students, as assessed by the students themselves, the architects, and the design studio teachers. Participants were 52 architectural students who were administered a design task, and a questionnaire about the Cognitive Orientation of Creativity (COQ-CR). The independent variables were the scores of the themes for motivation obtained from the COQ-CR, and the dependent variables were design creativity as assessed by design students, expert architects, and design instructors. Findings support the validity of the COQ-CR for assessing motivation in creativity and of the cognitive motivational approach to creativity. The results showed which attitudes and personality tendencies promote creativity. Significant differences in regard to several motivational themes were found between more creative and less creative students in the three groups of evaluators. Themes characterizing the more creative students were: readiness to make efforts and invest in the design task, willingness to use talent to achieve originality, freedom to apply individual criteria, and delve into the unknown. These findings suggest important implications for improving design education which are discussed in the paper.

Keywords: creativity, design, cognitive orientation, motivation

1 INTRODUCTION

Assessing creativity is a fundamental concern of design education. It is in the design studio where students acquire skills and knowledge, develop criteria for assessing their products, and get feedback from their instructors [1], [2]. Mostly instructors and students assess the creativity of the outcomes without awareness of the underlying motivational aspects. Moreover, they often try to promote creativity without considering personal motivations. In consequence, they focus on the mechanics of creativity but overlook the motor, the generator of energy.

There have been many studies and approaches to motivation for creativity, but these were not based on a comprehensive theory of motivation, and therefore they remained fragmentary, such as intrinsic motivation [3], bounded rationality [4] or the experience of flow [5]. The motivational approach applied in this study is the Cognitive Orientation theory [6] [7] which is one of the more advanced and comprehensive theories of

motivation that provides a conceptual framework, and an assessment procedure with a good empirical basis. The main theoretical tenet is that behavior in all domains – including creativity and design – is a function of motivation and performance, whereby motivation is conceptualized in terms of beliefs referring to specific themes.

In the present study we will focus specifically on themes which proved to be relevant for the assessment of motivation in creativity. Since a previous study [1] showed that experts and students do not always perceive design creativity in the same way, we examined them separately.

2 MOTIVATION FOR CREATIVITY AND THE COGNITIVE ORIENTATION THEORY

In recent years the creativity research agenda acknowledged the critical role played by motivation. It became clear that motivation may be one of the most important components affecting creativity [3], [8], [9]. In the present investigation the conceptual and methodological approach based on the Cognitive Orientation (CO) theory is applied for studying motivation for creativity in design. The CO theory is a cognitive-motivational approach to the understanding, prediction, and modification of behaviours in a variety of domains, such as motor, emotional and cognitive [10], [11]. The major tenet of the CO theory is that outcomes are a function of a motivational disposition. The motivational disposition is regarded as a product of beliefs applied for identifying the input and processing its meaning. The main characteristics of motivational disposition are directionality and strength. Directionality of the motivational disposition specifies the activity toward which the motivation is oriented. Strength is assessed by the number of beliefs supporting or orienting toward the particular activity direction; the more beliefs there are the stronger is the motivational disposition. Beliefs differ in form and contents. Form is concerned with four types of beliefs: about self, goals, norms, and general (about others and reality). Contents is represented by themes that do not refer directly to the behaviour but reflect the meanings underlying the studied behaviour, identified by a standard procedure developed by the theory and validated by empirical testing [6]. The beliefs are assessed in the form of a CO questionnaire that includes statements referring to the themes and corresponding to the four belief types, which the participant is requested to endorse or reject. It yields scores for the different themes. In the present study we will concentrate on the contents characterizing the beliefs relevant for design, disregarding the form in terms of the types of beliefs.

The CO questionnaire of creativity (COQ-CR) is a measure of the motivation for creativity that was developed and used in different types of domains requiring creativity, engineering problem solving, interpretation of metaphors, or devising innovative uses for energy [12]. It provides scores for a set of themes that describe contents relevant for engaging in creativity (See Method Section). Advantages of this measure are (i) it has been constructed according to a theoretically-driven procedure that ensures the relevance of the themes to creativity; (ii) it is based on a variety of contents that specifies a profile of creativity, (iii) it has been tested empirically, (iv) it has a wide range of applicability for creativity outcomes.

2.1 Motivation for design creativity

Csikszentmihalyi [13] refers to creativity as special skills applied to communicate atypical thoughts, formulate insightful judgments, produce noteworthy discoveries, and comprehend reality in an unusual way. Creative thinking is also defined as a cognitive process of original problem solving through which innovative outcomes are created [14], [15], [16]. An outcome can be any type of solution to a problem, being abstract as

an idea, or concrete as an art product. Original is defined as atypical, statistically infrequent, and of high quality and value. Creativity is a fundamental element characterizing design. A design product is expected not only to be functional, aesthetic, and useful, but also original and valuable [17]. Besides creativity, disposition for motivation is regarded as a most significant element influencing creative design performance. Despite the strong impact that motivation has in the creative design domain, designers, i.e., professionals, instructors, or students, quite frequently assess creativity without awareness of the underlying motivational aspects affecting the design activity. It is often the case that they evaluate and try to promote creativity without bearing in mind personal motivations. In consequence, they pay more attention to the mechanics of creativity than to the engine that provides the driving force to engage in creative performance.

In the present study, the COQ-CR was applied for studying the effects of motivation on the creativity of design students. The themes, reflecting the contents relevant for design creativity, were expected to provide insights into the specific personal dynamics of the motivation for creativity in the two groups of students, differing for their level of creativity. The study sample consists of students whose manifestations of creativity may be reduced by a number of factors, such as lack of self-reliance, low level of expertise, and limited design knowledge. Under these circumstances, the testing of the relations of creativity to motivation is made especially challenging, and particularly important for design education.

3 EMPIRICAL STUDY

The main objective of this study was to investigate motivational themes that can be related to design creativity, and to elaborate on possible consequences for design education. The goal was (i) to explore what are the themes identified in the assessment of motivation for creativity that make a difference between more creative and less creative students of design; and (ii) to find out whether such differences are shared independently of whether the assessment of creativity is carried out by architects, design studio teachers, or by the students themselves.

4 METHOD

4.1 Participants

Fifty-two students of architecture of both genders from 1st to 5th year participated in the empirical study. They ranged in age from 21 to 35 years. The mean age was 22.85 years.

4.2 Design Task

Participants were administered a problem that called for the design of a small museum. They were asked to produce a creative solution that would include: an exhibition area for the exposition of artistic pictures, a gallery for sculptures, a coffee-shop area, general services (i.e., bathrooms and cleaning room), and rooms for seminars, lectures, and administrative jobs. Located in the old city centre, the new museum was expected to provide a creative solution to the problem of building in a context characterized by historic buildings.

4.3 Questionnaire

On completion of the design task, students were requested to respond to the CO questionnaire of creativity (COQ-CR) [18]. It included 384 items, each of which

presented a particular content, e.g., curiosity, playfulness, doing things for fun. The items referred to different themes (n=79), identified in previous interviews with creative individuals in different domains and pretested for validity. In each item, participants were requested to check one of four response alternatives presented as a Likert-scale (agree completely, agree, disagree, disagree completely, scored as 4, 3, 2 and 1 points, respectively). In addition, the students were requested to evaluate the creativity of their design work on a 5-point scale.

4.4 Procedure

The design task was explained to the students orally, and thereafter they were administered a sheet with the general instructions and a schematic map of the area, together with 10 A3 serially numbered sheets of paper. Half of the participants responded to the COQ-CR after completion of the design, and the others prior to it.

4.5 Evaluation of creativity

The outcomes produced by the students were evaluated for creativity by four architects, with an experience in practice of at least 10 years in design practice, and by the students themselves. The evaluations consisted in rating the overall creativity of each design project on a 5-point scale ranging from 1(=low creativity) to 5 (=high creativity). The evaluations were done independently, and evaluators were naïve to the goals of the study. Score means assigned to students by their design studio teachers were also considered for the evaluation of creativity.

5 RESULTS

The dependent variables in this study were those dealing with themes for the assessment of motivation in creativity (79 variables). The independent variables were those concerned with the assessment of overall creativity of the students' as rated by each of the following group of referees: (a) the four architects (one variable, averaged across the four evaluators), (b) the students (one variable), and (c) the mean score obtained by each student in the design studio in the course of his/her academic studies (one variable).

The statistical procedures used for analyzing the data were mean comparisons (by the t-test). These comparisons were carried out between the high-creativity and low-creativity groups for each independent creativity variable as assessed by each group of referees. Results concerning the assessment by architects yielded significant differences between students high and low in creativity in the following themes: (i) feeling it is incumbent upon them to activate and use their talents and unique abilities, (ii) interest and no discomfort in regard to views which differ or contradict their own, and (iii) daydreaming a lot.

Further results about self-assessment of creativity by students themselves showed significant differences between high creativity and low creativity students in the following themes: (i) demanding a lot from themselves, (ii) not in need of firm framework or strict regulations, (iii) tendency to do original things, and (iv) tendency to delve deeply into what one deals with and examine it from all points of view.

In the third analysis, results based on the assessment by design studio teachers showed that students high and low in creativity differed significantly in the following themes: (i) thinking about things in one's own way, and not necessarily as one has been taught, (ii) thinking and doing one's own thing even with no support from others, (iii) concern with the functionality of what one does, and (iv) ability and tendency to invest a lot of effort.

6 DISCUSSION

The investigation dealt with the study of motivation for creativity in design students. The Cognitive Orientation theory [6], [10] served as a comprehensive framework to define and assess motivation for design creativity. Findings showed that there are attitudes and personality tendencies that promote creativity. As expected, differences were found in scores of motivational themes between more and less creative students. This is an interesting finding since it demonstrates that more creative students always differ in their motivations to achieve creative designs, as compared to less creative students. This finding was seen to be true independently of who is the evaluator, i.e., a student, an architect, or a design studio teacher, or irrespective of the design environment, i.e., inside or outside the design studio.

Common elements identified by the analyses of the three groups of evaluators referred to three major themes: readiness to make efforts and invest in the design task; willingness to use talent to achieve originality; and freedom to apply individual criteria and delve into the unknown. These shared aspects characterizing motivation for design creativity are seen to be intrinsic to the essence of design problem solving, which is considered to be an ill-structured activity. Due to their nature, design problems cannot be solved by retrieving already existing solutions, or by applying routine processes. On the contrary, producing high quality design outcomes is an arduous process characterized by the exploration of unfamiliar solutions. This laborious task demands such big effort and dedication from the designer, that without the appropriate motivational disposition and talent it could hardly be successfully attained.

It is of special interest to note that the themes promoting creativity include at least one theme that may seem contradictory to what is usually encouraged in design studies: freedom to apply individual criteria. It may appear difficult to accommodate this theme together with the effort to teach students to work according to the common criteria and standards. Our findings suggest that it may be necessary to find ways to enable the application of individual criteria side by side with the common ones, so that individuality may thrive despite conformity.

It is important for design instructors to become aware of the importance of motivation for creativity and of encouraging it in their students, in addition to teaching them skills and techniques of designing. It is likely that up to now instructors of design who may have been aware of the importance of motivation for creativity have not applied themselves to the task because they did not know how to do it beyond praising creativity as such. The findings of the present study provide instructors with a concrete tool for promoting motivation, which is considered to be the trigger of creativity, within the design studio. It is evident that endorsing motivation can be done by discussing with the students the various creativity-promoting themes identified in this study and establishing in the students a firm basis of personal beliefs supporting the mentioned themes. Awareness of motivational aspects for creativity can endow design studio instructors with better criteria to assess creativity and to encourage creative design performance. This can be relevant not only for enhancing the quality of design products, but also for improving the design process itself. Finding ways to supporting motivational disposition can be particularly helpful for those students who lack self-confidence or not have enough design expertise.

REFERENCES

- [1] Casakin, H. and Kreitler, S. Correspondences and Divergences in Creativity Evaluations between Architects and Students. *Environmental Planning and Design: Design B*, (in press).
- [2] Kreitler, S. and Casakin, H. Self-Perceived Creativity: The Perspective of Design,

- (submitted).
- [3] Collins, M. A. and Amabile, T. M. Motivation and Creativity. In Sternberg R.J., ed. *Handbook of creativity*, pp. 297-312 (Cambridge University Press, New York, 1999).
 - [4] Gigerenzer, G. and Selten, R. Rethinking rationality., In Gigerenzer, G., Selten, R., eds. *Bounded Rationality: The Adaptive Toolbox*, pp.1-12 (The MIT Press, Cambridge, MA, 2001).
 - [5] Csikszentmihalyi, M. Motivation and creativity: toward a synthesis of structural and energetic approaches to cognition..*New Ideas in Psychology*, 1988, 6,(2), 159-76.
 - [6] Kreitler, H. and Kreitler, S. The Theory of Cognitive Orientation: Widening the Scope of Behavior Prediction. *Progress in Experimental Personality Research*, 1982, 11, 101-169.
 - [7] Kreitler, S. The Cognitive Guidance of Behavior. In Jost, J. T., Banaji, M. R. and P. A. Prentice, eds. *Perspectivism in Social Psychology: The Yin and Yang of Scientific Progress*, pp. 113-126 (American Psychological Association, Washington, DC., 2004).
 - [8] Runco, M. A. Creativity as an Extracognitive Phenomenon. In Shavinina L. V. and Ferrari, M., eds. *Beyond Knowledge: Extracognitive Aspects of Developing High Ability*, pp. 17-25 (Lawrence Erlbaum Associates Publishers, Mahwah, NJ, 2004).
 - [9] Runco, M. A. Motivation, Competence, and Creativity. In Elliot A. J. and Dweck C. S., eds. *Handbook of Competence and Motivation*, pp. 609-623 (Guilford, New York, 2005).
 - [10] Kreitler, H. and Kreitler, S. *Cognitive Orientation and Behavior* (Springer Publishing, New York, 1976).
 - [11] Kreitler, S. and Kreitler, H. Plans and planning: Their Motivational and Cognitive Antecedents. In Friedman, S. L., Scholnick, E. K. and Cocking, R. R., eds. *Blueprints for thinking: The Role of Planning in Cognitive Development*, pp. 110-178 (Cambridge University Press, New York, 1987).
 - [12] Margalio, A. *A Model for Teaching the Cognitive Skill of Melioration to Pre-Service Science Teachers in a College for Teachers*. Unpublished Doctoral Dissertation, Bar-Ilan University, Ramat Gan, Israel, 2005.
 - [13] Csikszentmihalyi, M. *Creativity -Flow and the Psychology of Discovery and Invention*. Harper Perennial, New York, 1997.
 - [14] Milgram, R. M., ed. *Teaching Gifted and Talented Children Learners in Regular Classrooms*. Charles C. Thomas, Springfield, IL, 1989.
 - [15] Casakin, H., Davidovitch, N. and Milgram, R.M. Creative Thinking as a Predictor of Creative Problem-Solving in Architectural Design, (submitted).
 - [16] Kaufman, C. & Sternberg R. J., eds. *International Handbook of Creativity* (Cambridge University Press, New York, 2006).
 - [17] Christiaans, H. Creativity as a Design Criterion. *Creativity Research Journal*, 2002, 14(1), 41-45.
 - [18] Kreitler, S. and Kreitler, H. *The Cognitive Foundations of Personality Traits*. (Plenum, New York, 1990).

¹Hernan CASAKIN
 Ariel University Center of Samaria
 Department of Architecture
 PO BOX 3
 44837 Ariel
 Israel
 casakin@bezeqint.net
 +972-9-7660756

²Shulamith KREITLER
 Tel Aviv University
 Department of Psychology
 Ramat Aviv
 Tel Aviv 69978
 Israel
 Krit@netvision.net.il
 +972-3-5227185