

META-ANALYSIS OF THE STUDIES ON MOTIVATION AND CREATIVITY RELATED TO PERSON

**Saul Neves de Jesus, Susana Imaginário, Joana Nobre Duarte, Sandra Mendonça,
Joana Santos** (University of Algarve, Portugal)
Claudia Lenuta Rus (Babes-Bolyai University, Romania)
Willy Lens (University of Louvain, Belgium)

ABSTRACT

Creativity and Motivation are two of the main psychological concepts to understand the flexibility and innovation of human behavior. Nevertheless many studies were conducted on both concepts, but any meta-analysis about the relationship between them was previously done. Thus, the aim of this study was to analyze the relationship between intrinsic motivation and creativity related to person by using meta-analytic procedures based on random-effects model.

The present meta-analysis included seven independent samples (representing a total of N= 3,173 participants) that met the inclusion criteria. The results indicated the expected significant positive relationship between intrinsic motivation and creativity related to person ($\bar{r}_0 = .34$, 95% CI = [.30, .39]). The percentage of the variance explained by sampling error (36.29% < 75%) and the probability of the Q test ($p < .01$) revealed that there was no homogeneity across the effect sizes included in the whole set of studies. The moderator analysis indicated that the relationship between intrinsic motivation and creativity related to person was moderated by the type of the sample (students vs. employees). Particularly, it was found that intrinsic motivation is stronger related to creativity on the sample of employees compared to those of students.

Keywords: Creativity related to person; Intrinsic Motivation; Creativity; Meta-analysis.

INTRODUCTION

Since Humanistic Psychology, motivation and creativity were considered as two concepts that could have important relationships (Maslow, 1954).

Many researches were conducted and many theories were proposed about motivation and creativity since many years, and these concepts had an important contribution for the history of Psychology, and for the explanation of human behavior, namely in what concern to his flexibility and potential for learning.

In particular, taking into account that all behaviors are motivated, motivation it is a key concept in Psychology. As Weiner said "motivation lies at the heart, the very center of Psychology" (1992, 1).

Nevertheless, at the last decades, there was a tendency to a higher specialization of the authors, and specific theories and variables began being proposed for behavior analysis.

As contemporary motivational theories have become more specific and precise, they have also become more restricted in their range. For instance, many theories tend to overvalue just one concept or variable, such as intrinsic motivation (Deci, 1975).

When this occurs, an integration of theories becomes especially profitable for a better understanding of the complexity of human behavior.

As Madsen point out: "the importance of motivation coupled with the existence of many different theories of motivation created a major problem for psychologists" (1974, p. 13).

This situation was considered by Ford as an "identity crisis, centering on the problem of how to define the field of motivation" (1992, p. 4).

One of the ways to solve this identity crisis is to select several theories of motivation that could be additionally together and integrate them in a more complex theoretical model. An integration of theories becomes especially profitable for a better understanding of the complexity of human behavior.

A theoretical integration should seek to harmonize the contributions from various relevant, comparable and comprehensive theories.

If competing theories make the same basic epistemological assumptions and differ primarily due to the specialization and focus of their authors, it is often best to undertake a coherent unification of those theories, in order to be better able to explain the complexity of the phenomenon under study.

An original theoretical synthesis, or a more global framework, may result from such an integration. In a previous study we formulated a theoretical model of different cognitive-motivational theories in order to explain functional relations that exist between cognitive-motivational variables. The results showed the empirical sense of the proposed model (Jesus & Lens, 2005).

Another option is to select a theory of motivation that should be the best for the aims of a new research.

To analyze the relationships between motivation and creativity, it seems that intrinsic motivation is the best theory, because the majority of the studies about the relationship between motivation and creativity use intrinsic theory as the framework for that (Amabile, 1996; Runco, 2007).

Intrinsically motivated activities are those for each ones there isn't any further more reward than the activities themselves. For the subject intrinsically motivated by an activity, this kind of activity is an end in itself (Deci, 1975).

One decade after proposed the theory of intrinsic motivation, this theory was developed by Deci and Ryan (1985), pointing out the competence and the self-determination as the basis for intrinsic motivation, that is, the subject is more intrinsically motivated for an activity as higher his own perception of competence at this activity, and higher his autonomy and decision making related to this activity.

More recent advances in this theory were done by Chikszentmihalyi (1988; 1996) with the flow theory. Flow is the state of mind known as the action of inaction or doing without doing.

At this [mental state](#) of operation a person in an activity is fully immersed in a feeling of energized focus and full involvement in the process of the activity. The activity is intrinsically [rewarding](#), so there is an effortlessness of action. According to Csikszentmihalyi (1988; 1996), flow is completely focused [motivation](#). It is a [single-minded immersion](#) and represents perhaps the ultimate in harnessing the [emotions](#) in the service of performing and [learning](#). This author hypothesized that people with several very specific personality traits, called autotelic personalities, may be better able to achieve flow than the average person. These personality traits include curiosity, persistence, low self-centeredness, and a high rate of performing activities for intrinsic reasons only.

So this theory allows for connections between intrinsic motivation and creativity (Imaginário, Duarte & Jesus, 2010).

Creativity is a complex concept, with authors diverging in their precise definitions (Quitério, Martins, Silva, Pacheco, Martins, Mendonça & Jesus, 2010). Meusbürger, Funke and Wunder (2009) claimed that over a hundred different versions can be found in the literature. At the same way, a previous paper identified 239 instruments to assess creativity (Hilário, Martinho, Godinho, Martins, Pacheco, Mendonça & Jesus, 2010).

But, as Candeias (2008) point out, the increase of the relevance of this concept in Psychology, was simultaneous to the diversity of theoretical models and instruments to assess it.

Nevertheless, creativity is generally considered as a phenomenon whereby a person creates something new (a product or a solution) that has some kind of value (Morais, 2001).

Theories of creativity (in particular investigating why some people are more creative than others) have focused on a variety of aspects. Initially proposed by Rhodes (1961), the most dominant are usually identified as the four "P's" of creativity: process, product, person and place (Kaufman & Sternberg, 2010). Additionally these facets are interrelated, they could be distinguished. Creativity related to the person refers to the individual degree of creativity, and creativity related to the product is the outcome of creativity, and it's usually his materially focused expression. The place means the conditions or the environment to create. The process of creativity is the "bridge" between the person and the product, and several stages could be identified: preparation, incubation, intimation, illumination or insight, and verification. [Graham Wallas](#), in his work *Art of Thought*, published in 1926, it's usually identified as the first model of the creative process, but the paper of Leibbrand (1940) is the first publication obtained by a search in the Web of Knowledge database.

This concept had a higher important recognition at Psychology after Guilford, as APA President, namely by his paper "Creativity" in 1950. [Guilford](#) (1950; 1967) performed important work in the field of creativity, drawing a distinction between [convergent and divergent production](#) (commonly renamed convergent and divergent thinking). [This](#) author

was pioneered the modern [psychometric](#) study of creativity and constructed several tests to measure creativity in 1967.

Nevertheless, Guilford considered creativity as part of intelligence, and was Torrance (1974) that point out the identity and autonomy of this concept. Building on Guilford's work, [Torrance](#) developed the [Torrance Tests of Creative Thinking](#) in 1966. It involved simple tests of divergent thinking and other problem-solving skills, which were scored on fluency, originality and elaboration.

Others authors had an important contribution for the recognizing of this concept, such as Gardner (1982; 1993), Runco (1997), and Sternberg (1999).

Specifically about the relationships between creativity and motivation, it could be point out the work of Csikszentmihalyi (1996) and Amabile (1996).

To Amabile (1996) creativity thrive in conditions of freedom, and creative performance is believed to be more dependent on intrinsic motivation than are other types of performance. This author argued that to enhance creativity in business, three components were needed: expertise, creative thinking skills and intrinsic motivation.

At a recent meta-analysis about the relationship between stressors and creativity, Byron, Khazanchi and Nazarian (2010) concluded that mediators, such as motivation, may further explain the relationship between stressors and creative performance, and recommend that future research should examine mediation of intrinsic motivation.

More than five hundred studies were published pointing out the relationship between creativity and motivation. The most part of the studies was about intrinsic motivation and creativity related to product. Probably there are more studies about creativity related to product than the other three aspects of creativity because sometimes were an equivalence between “creative thinking” and “productive thinking” (Sternberg, 1988), as well as between “divergent thinking” and “divergent production” (Guilford, 1967). At other paper (Jesus, Rus, Lens & Imaginário, in press), we did a meta-analysis of the studies about the relationship between intrinsic motivation and creativity related to product.

The main aim of this paper is to make a meta-analysis of the previous empirical studies about the relationship between intrinsic motivation and creativity related to person.

METHOD

Selection of the studies

In order to identify the relevant studies for this meta-analysis, it was performed a computerized search in the online database Web of Science®-with Conference Proceedings (ISI Web of KnowledgeSM). This search was conducted using simultaneously the following broad keywords: *motivation* and *creativity*. The search period was limited to studies published from 1990 until 31st December 2010. The first study retrieved was Karle, J. (1990).

The role of motivation in scientific-research. A view of creativity. *Interdisciplinary Science Reviews*, 15, 4, 357-363. The last was Wyer, R. S. (2010). Global and local processing: A clarification and integration. *Psychology Inquiry: An International Journal for the Advancement of Psychological Theory*, 21, 3, 250-256. This search was conducted in 31st December 2010 and generated 533 citations. From these citations only those published in English were selected.

The selected studies had to meet several criteria in order to be included in the analysis:

1. To include a measure of intrinsic motivation as an independent variable from extrinsic motivation
2. To include a measure of creativity related to person
3. To examine intrinsic motivation and creativity using a sample from the general, nonclinical population
4. To examine intrinsic motivation and creativity at an individual level of analysis (and not to a group, organizational and societal level of analysis)
5. To report a value of the Pearson product-moment correlation (r) between intrinsic motivation and creativity or to provide the necessary statistical information to compute an effect size.

In this analysis were excluded:

1. The studies or the samples that did not reported the r correlation coefficient or sufficient data for its calculation
2. The studies or the samples that were considered as being duplicates. In order to detect the duplicate studies we used the heuristically methodology presented by Wood (2008). We eliminate from the meta-analysis one of the studies that used the same sample and measurement instruments (e.g. Zhang & Bartol, 2010a). In this case of duplication, in the analysis it was chosen to be included only the first published study.

A number of 18 papers have met these inclusion and exclusion criteria. In the case of the studies that included on a single sample more than two instruments that measured the same construct (intrinsic motivation, or creativity related to person) we decided to aggregate the effect sizes. Because not all of the studies reported the correlation between the variables that measured the same construct, it was chosen to average the effect sizes. The relation between intrinsic motivation and creativity related to person was examined in seven studies that included seven independent samples and 3137 participants. All the studies that were included in the two meta-analysis are marked with an * in the reference list.

Coding of the studies

For each independent sample included in the analysis were coded the following information: sample size, sample type (child, college and undergraduate students vs. adult population),

study design (cross-sectional vs. causality-oriented design), reliability of the intrinsic motivation measure, creativity construct related to person, reliability of the creativity construct measure, the effect size or the information required to compute an effect size. The relevant information for each independent sample that was included in the analysis is presented in Table 1. The coding of the studies was done by two researchers. The differences related to the results of the coding were settled through discussions till the agreement between researchers was reached 100%.

Table 1. *The characteristics of the studies included in the meta-analysis of correlations between intrinsic motivation and creativity related to person (N =7)*

Reference	N	Sample type	Study design
Shalley, Gilson, & Blum (2009)	1465	Employees	Cross-sectional
Prabhu, Sutton, & Sauser (2008)	124	Students	Cross-sectional
Oral, Kaufman, & Agars (2007)- Study 2	575	Students	Cross-sectional
Choi (2004)	386	Students	Causality-oriented
Amabile, Hill, Hennessey, & Tighe (1994)	284	Students	Cross-sectional
Amabile, Hill, Hennessey, & Tighe (1994)	35	Students	Cross-sectional
Amabile, Hill, Hennessey, & Tighe (1994)	268	Employees	Cross-sectional

Procedure

In this study we used a random effects model in order to conduct the meta-analysis of the correlations r between intrinsic motivation and creativity, using Hunter and Schmidt's (1990; 2004) method. So, the common metric effect size in this study is r Pearson. Based on the rationale of the random effects model, we assumed that the population effect size is variable rather than constant (Hunter & Schmidt, 2004; Kisamore & Brannick, 2008).

First, it was calculated the sample-size weighted-mean correlation (r^*_o). The weighting variable in this study was the sample size (N) (Brannick, Yang, & Cafri, 2010). Using this procedure, it was gave more weight to the correlations that are least susceptible to sampling error (Hunter & Schmidt, 2004). In this study it was chosen to compute only the sample-size weighted-mean correlation because more than a half from the selected studies did not report the value and the type of the reliability coefficient of the instrument used to measure the variables included in the analysis. Given this situation we did not computed the attenuation-corrected correlations between the intrinsic motivation and creativity related to person.

Next step comprised the estimation of the confidence interval for each mean r correlation computed. In this study it was used a 95% confidence interval to assess the accuracy of the estimate of the mean effect size. Based on the rationale of the random effects model, it was expected that the mean size effect will fall within the 95% CI if other sets of studies were taken from the population of the studies that investigated intrinsic motivation in relation to

creativity. When the 95% CI does not include zero than the mean r effect size is significantly different from 0.

In the next step, it was estimated the degree to which the effect size is homogenous across studies using Hunter and Schmidt (1990, 2004) 75% rule. The value of the variance computed using this meta-analytic technique provides an indication of the degree to which the variability across studies may be due to other factors than sampling error. A smaller value of the observed variance than 75% indicates the existence of the moderators on the relationship between intrinsic motivation and creativity related to person. Ulterior, the homogeneity of the effect size was evaluated using a χ^2 test (Hunter & Schmidt, 1990, apud. Ellis, 2010). A significant probability of the χ^2 test indicates the presence of the moderators.

In order to identify potential moderators on the relationship between intrinsic motivation and creativity related to person, the total set of the studies was partitioned into subsets of studies that represent categories of the moderator variables such as sample type (students vs. employees), study design (cross-sectional vs. causality-oriented design). For each subset were computed meta-analysis correlations, variances and variance corrected for sampling error across moderator subsets. Based on these data, the presence of a moderator is revealed in two ways:

1. The average correlation will vary from subset to subset
2. The standard deviation will average lower in the subsets than for the standard deviation of the whole set (Hunter & Schmidt, 2004).

Also, a separate χ^2 test was computed for studies within each category of the moderator. Following Aguinis, Sturman and Pierce (2009), in order to test the differences between the mean correlations across moderator subsets, it was performed a statistical significance test. It was chose the Welch's t test (Welch, 1938, 1947) for unequal sample sizes and variances, using a two-tailed test for significance.

RESULTS AND DISCUSSION

The aim of the study was to analyze the relationship between intrinsic motivation and creativity related to person by using meta-analytic techniques. First, we present the results of the meta-analysis of correlations between intrinsic motivation and creativity related to person including the main effects (Table 2) followed by the moderator effects (Table 3).

Table 2 comprises the results of the overall meta-analysis of the correlations between intrinsic motivation and creativity related to person. Data reflect the number of independent samples that investigated each relationship (k), the total number of the participants from the all independent sample included in the analysis (N), the sample size-weighted mean effect

size (\bar{r}_0), the estimated standard deviation (SD), the 95% confidence interval (95% CI), the percentage of the variance explained by sampling error (%), and χ^2 test.

Table 2. Overall results of the meta-analysis of correlations between intrinsic motivation and creativity related to person

Variable	k	N	\bar{r}_0	SD	95%CI	% variance explained by artifacts	$\chi^2_{(k-1)}$
Creativity related to person	7	3137	.34	.06	[.30;.39]	36.29%	19.28**

The results indicate that intrinsic motivation is moderated associated with creativity related to person ($\bar{r}_0 = .34$). The relationship between these two variables is significant as reflected by the 95% CI [.30; .39] that does not include the 0 value.

Even if the 95%CI of the mean \bar{r}_0 indicate the presence of a significant relationship between intrinsic motivation and creativity related to person, the two homogeneity tests revealed that this relationship is influenced by some moderators. As shown in the Table 2, the percentage of variance explained by artifacts was below 75% (36.29% < 75%). The heterogeneity of the effect size across the studies included in the analysis was reflected also by the chi-squared test. The value of this test is significant at $p < .01$. So, the percentage of the variance explained by the artifacts and the chi-squared test indicate the need for a moderator analysis of the relationship between intrinsic motivation and creativity related to person. In the case of the variables that did not included at least two independent samples per subset they were dropped from the moderator analysis.

Table 3 summarizes the results of the moderator meta-analysis of correlations between intrinsic motivation and creativity variables by type of sample (students vs. employees).

Table 3. Moderator analysis of the meta-analysis of correlations between intrinsic motivation and creativity by type of sample (students vs. employees)

Variable	Students					Employees					t test	
	k	N	\bar{r}_0	SD	$\chi^2_{(k-1)}$	k	N	\bar{r}_0	SD	$\chi^2_{(k-1)}$	t	df
Creativity-person	5	1404	.27	0	2.74	2	1733	.40	0	.03	6.88**	4

The results reveal that type of sample is a moderator of the relationship between intrinsic motivation and creativity related to person. As shown in the Table 3, the mean effect sizes vary across the two subsets of the studies and their standard deviations are less than the standard deviation of the whole set of studies ($0 < .06$). The probability of the t test indicates a significant difference between the mean correlations of the two subsets, $t(4) = 6.88$, $p < .01$. The studies that used employees as participants present a mean correlation that is higher compared to that of the studies that used samples of students ($.40 > .27$). It seems

that the relationship between intrinsic motivation and creativity related to person is stronger on the samples of employees compared to those of students.

CONCLUSIONS

The main conclusion of this meta-analysis is that creativity related to person is significantly associated with intrinsic motivation, and this relationship is influenced by some moderators, namely the type of sample, that is the relationship between the two variables is stronger on the samples of employees compared to those of students.

These results had several implications, namely about how to increase motivation and creativity at different contexts, such as schools and organizations.

At school, students are more creative when they see a task as intrinsically motivating, valued for its own sake (Robinson & Azzam, 2009). To promote creative thinking educators need to identify what motivates their students and structure teaching around it. By other way, to encourage motivation and creativity at work, several managerial practices could be used, such as challenge, freedom, resources, supervisory encouragement and organizational support (Amabile, 1996).

One of the conclusions of Byron, Khazanchi and Nazarian (2010) research is that uncontrollability conditions thwart the need for autonomy and competence, and so diminish intrinsic motivation to be creative and cause decrements in creative performance.

Edison's famous line "genius is one per cent inspiration and ninety-nine per cent perspiration", translate the importance of effort and motivation for the creativity.

Recently, at 2009, was the "European year" of creativity, and Pink (2005) argued that we are entering a new age where creativity is becoming increasingly important.

Future researches about the relationships between creativity and motivation, using meta-analysis techniques, should study other aspects of creativity.

End Note: The authors wish to thank for the financial support provided from "Instituto de Psicologia Cognitiva" (Portugal), and the program co-financed by THE SECTORAL OPERATIONAL PROGRAM FOR HUMAN RESOURCES DEVELOPMENT, Contract **POS DRU 6/1.5/S/3** – "DOCTORAL STUDIES, A MAJOR FACTOR IN THE DEVELOPMENT OF SOCIO-ECONOMIC AND HUMANISTIC STUDIES" (Romania).

References

- Aguinis, H., Sturman, M. C., & Pierce, C. A. (2008). Comparison of the three meta-analytic procedures for estimating moderating effects of categorical variables. *Organizational Research Methods, 11*, 1, 9-34.
- Amabile, T. M. (1996). *Creativity in context*. Boulder, CO: Westview Press.
- *Amabile, T. M., Hill, H. G., Hennessey, B. A., & Tighe, E. M. (1994). The Work Preference Inventory: Assessing intrinsic and extrinsic motivational orientations. *Journal of Personality and Social Psychology, 66*, 5, 950-967.

- Brannick, M. T., Yang, L.-Q., & Cafri, G. (2010). Comparison of weights for meta-analysis of r and d under realistic conditions. *Organizational Research Methods*, 000(00), 1-21, DOI: 10.1177/1094428110368725.
- Byron, K, Khazanchi, S., & Nazarian, D. (2010). The Relationship Between Stressors and Creativity: A Meta-Analysis Examining Competing Theoretical Models. *Journal of Applied Psychology*, 95, 1, 201–212.
- Candeias, A. (2008). Criatividade: Perspectiva integrativa sobre o conceito e sua avaliação [Creativity: Integrative perspective about this concept and it's evaluation]. In M. F. Morais and S. Bahia (Eds.), *Criatividade: Conceito, Necessidades e Intervenção* (pp. 41-63). Braga: Psiquilíbrios Edições.
- *Choi, J. N. (2004). Individual and contextual predictors of creative performance: The mediating role of psychological processes. *Creativity Research Journal*, 16, 2 & 3, 187-199.
- Csikszentmihalyi, M. (1988). HYPERLINK
 "http://books.google.com/books?id=INt6bdfoyxQC&lpg=PA15&ots=k7PBnsl5ye&dq=The%20flow%20experience%20and%20its%20significance%20for%20human%20psychology&hl=de&pg=PA15" \| "v=onepage&q&f=false" [The flow experience and its significance for human psychology](http://books.google.com/books?id=INt6bdfoyxQC&lpg=PA15&ots=k7PBnsl5ye&dq=The%20flow%20experience%20and%20its%20significance%20for%20human%20psychology&hl=de&pg=PA15). In M. Csikszentmihalyi, M. (Ed.), *Optimal experience: psychological studies of flow in consciousness* (pp. 15–35). Cambridge, UK: Cambridge University Press.
- Csikszentmihalyi, M. (1996). *Creativity: Flow and the Psychology of Discovery and Invention*. New York: Harper Collins.
- Deci, E. L. (1975). *Intrinsic motivation*. New York: Plenum Press.
- Deci, E., & Ryan, R. (1991). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum Press.
- Ellis, P. D. (2010). *The essential guide to effect sizes: Statistical power, meta-analysis, and the interpretation of research results*. New York: Cambridge University Press.
- Ford, M. E. (1992). *Motivating Humans. Goals, Emotions, and Personal Agency Beliefs*. London: Sage Publications.
- Gardner, H. (1982). *Art, Mind & Brain. A cognitive approach to creativity*. New York: Basic Books SAGE Publications.
- Gardner, H. (1993). *Creating Minds*. New York: Basic Books SAGE Publications.
- Guilford, J.P. (1950). Creativity. *American Psychologist*, 5, 9, 444–454.
- Guilford, J.P. (1967). *The Nature of Human Intelligence*. New York: McGraw-Hill.
- Hilário, J., Martinho, J., Godinho, P., Martins, A., Pacheco, A., Mendonça, S., & Jesus, S. N. (2010). Instrumentos de avaliação da criatividade. Revisão da literatura [Instruments to assess creativity. Literature review]. *VII Simpósio Nacional de Investigação em Psicologia*. Braga.
- Hunter, J. E., & Schmidt, F. L. (2004). *Methods of meta-analysis: Correcting error and bias in research findings (2nd ed.)*. Thousand Oaks, CA: Sage.
- Hunter, J. E., & Schmidt, F. L. (1990). *Methods of meta-analysis: Correcting error and bias in research findings*. Newbury Park, CA: Sage.
- Imaginário, S., Duarte, J., & Jesus, S. (2010). Criatividade e Motivação. Revisão da literatura [Creativity and Motivation. Literature review]. *IX Encontro de Psicologia no Algarve*. Faro.

- Jesus, S. N., Rus, C., Lens, W., & Imaginário, S. (in press). Creativity and Intrinsic Motivation: A meta-analysis of the Studies Between 1990-2010. *Creativity Research Journal*
- Jesus, S. N., & Lens, W. (2005). An integrated model for the study of teacher motivation. *Applied Psychology: An International Review*, 54, 1, 119-134.
- Karle, J. (1990). The role of motivation in scientific-research. A view of creativity. *Interdisciplinary Science Reviews*, 15, 4, 357-363.
- HYPERLINK "http://en.wikipedia.org/wiki/James_C._Kaufman" [Kaufman](#) , J. C., & Sternberg, R. J. (2010). *The Cambridge Handbook of Creativity*. Cambridge: HYPERLINK "http://en.wikipedia.org/wiki/Cambridge_University_Press" [Cambridge University Press](#) .
- Kisamore, J. L. & Brannick, M. T. (2008). An illustration of the consequences of meta-analysis model choice. *Organizational Research Methods*, 11, 1, 35-53.
- Leibbrand, A. (1940). Inspiration and achievement in the musical contribution to creating a Psychology of Creativity and development of creative human laws. *Nervenarzt*, 13, 6, 271-271.
- Madsen, K. (1974). *Modern theories of motivation*. Copenhagen: Munksgard.
- Maslow, A. (1954). *Motivation and personality*. New York: Harper & Row.
- Meusburger, P., Funke, J., & Wunder, E. (2009). *Milieus of Creativity: An Interdisciplinary Approach to Spatiality of Creativity*. Dordrecht: Springer.
- Morais, M. F. (2001). *Definição e avaliação da criatividade [Creativity definition and assessment]*. Braga: Universidade do Minho.
- *Oral, G., Kaufman, J. C., & Agars, M. D. (2007). Examining creativity in Turkey: Do Western findings apply? *High Ability Studies*, 18, 235-246.
- *Prabhu, V., Sutton, C., & Sauser, W. (2008). Creativity and certain personality traits: Understanding the mediating effect of intrinsic motivation. *Creativity Research Journal*, 20(1), 53-66, doi:10.1080/10400410701841955.
- Pink, D. H. (2005). *A Whole New Mind: Moving from the information age to the conceptual age*. New York: Riverhead Books.
- Quitério, C., Martins, M., Silva, S., Pacheco, A., Martins, A., Mendonça, S., & Jesus, S. N. (2010). Sistematização do Conceito e Modelos Teóricos da Criatividade [Creativity concept and theoretical models systematic analysis]. *VII Simpósio Nacional de Investigação em Psicologia*. Braga.
- Rhodes, M. (1961). An analysis of creativity. *Phi Delta Kapan*, 42, 305-310.
- HYPERLINK "http://en.wikipedia.org/wiki/Ken_Robinson" \o "Ken Robinson" [Robinson](#) , K., & Azzam, A. M. (2009). Why creativity now?. *Educational Leadership*, 67, 1, 22-26.
- Runco, M. A. (1997). *The creativity research handbook*. Cresskill, NJ; Hampton Press.
- Runco, M. A. (2007). *Creativity. Theories and Themes: Research, Development, and Practice*. London: Elsevier Academic Press.
- *Shalley, C. E., & Perry-Smith, J. E. (2001). Effects of social-psychological factors on creative performance: The role of informational and controlling expected evaluation and modelling experience. *Organizational Behavior and Human Decision Processes* , 84, 1, 1-22.
- Sternberg, R. J. (1988). *The nature of creativity*. Cambridge, NY: Cambridge University Press.
- HYPERLINK "http://en.wikipedia.org/wiki/Robert_Sternberg" \o "Robert Sternberg" [Sternberg](#) , R. J. (1999). *Handbook of Creativity*. Cambridge: HYPERLINK

"http://en.wikipedia.org/wiki/Cambridge_University_Press" [Cambridge University Press](#)

- Torrance, E. P. (1971). *Technical-norms manual for the Creative Motivation Scale*. Athens, GA: Georgia Studies of Creative Behavior, University of Georgia.
- HYPERLINK "http://en.wikipedia.org/wiki/Ellis_Paul_Torrance" \o "Ellis Paul Torrance"
[Torrance, E. P.](#) (1974). *Torrance Tests of Creative Thinking: Norms and Technical Manual*. Bensenville; IL: Scholastic Testing Service.
- HYPERLINK "http://en.wikipedia.org/wiki/Graham_Wallas" [Wallas](#) , G. (1926). *Art of Thought*. New York: Harcourt Brace.
- Weiner, B. (1992). *Human Motivation. Metaphors, Theories, and Research*. London: Sage Publications.
- Welch, B. L. (1938). The significance of the difference between two means when the population variances are unequal. *Biometrika*, 29, 3-4, 350-362, doi:10.1093/biomet/29.3-4.350 .
- Welch, B. L. (1947). The generalization of "Student's" problem when several different population variances are involved. *Biometrika*, 34, 1-2, 28-35, doi:10.1093/biomet/34.1-2.28.
- Wood, J. A. (2008). Methodology for dealing with duplicate study effects in a meta-analysis. *Organizational Research Methods*, 11, 79-95.
- Wyer, R. S. (2010). Global and local processing: A clarification and integration. *Psychology Inquiry: An International Journal for the Advancement of Psychological Theory*, 21, 3 , 250-256.
- Zhang, M. X., & Bartol, K. M. (2010). The influence of creative process engagement on employees creative performance and overall job performance: A curvilinear assessment. *Journal of Applied Psychology*, 95, 5 , 862-873.