Exploring Effective Management Style for Creative Workers with Effect Size Analysis

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This study explored the effective management style for creative workers through an internet questionnaire survey. A path model explaining workers' performance with creativity, work environment and cultural tolerance was tested with correlation, regression and path analyses for creative and general workers. The results were compared to elucidate characteristics of creative workers, one of which was that creative workers' "work environment was not 'open' and they tended to withdraw inside." This is a novel finding since it conflicts with the generally accepted notion that creative workers are outgoing and need open environment. Note that effect size analysis was adopted for there was a large difference between the sizes of two groups. Although the analysis might be useful in the field of business studies where such difference is common, appropriate criteria for judging effect size in the filed should be established.

Keywords—Creative worker, Creative industry, Creativity, Management, Effect size analysis

I. BACKGROUND

Today, the importance of creative workers is increasing more than before partly due to the information revolution. From many previous research, we define creative workers as workers earn by the extraction of skills in creative endeavors (Caves 2000; Bontje and Rühmann 2008, McKinlay and Smith 2009). Some creative workers with strong performance are said to affect the performance of their companies (McKinlay and Smith 2009), and it is crucial for companies in creative industries to manage their creativity for enhancing performance.

So far, most researchers in business creativity research have insisted that "creativity equally exists in every worker in every industry, and it is a responsibility of management to make a worker fully exert his/her creativity" (Amabile, 1988,1996; Sternberg & Lubart, 1991, 1995; Csikszentmihalyi, 1991). We, however, obtained multiple witnesses stating that "creativity of creative workers is native and cannot be managed" from practitioners (Caves, 2000; Hartley et al., 2005). Therefore, there is a contradiction between our work and the previous researches - "creativity can be managed or not?"

II. PREVIOUS RESEARCHES

Our literature survey showed that most previous researches dealt with organizations, while some of them with individuals (Fig. 1). They can be further classified into artistic and commercial, except the area of commercial individuals, which remained almost intact. Especially, there have been few researches with our prospect that "a creative worker enhances business performance through exerting his/her creativity."

Creative workers could be classified into three classes, genius, high performance creative workers and general creative workers according to the division of Big C (extraordinary creativity), small c (ordinary creativity) proposed by Maslow, Fraser, and Cox (1970). Although investigating the top class might be beneficial, we focused the lowest class (general creative workers) since it had the most workers. After setting a focus, we tried to clarify the process of their enhancing performance under proper management by comparing with workers in other industries.

Table 1. Previous Research Matrix

	Artistic	Commercial
Organization Company Region Nation	✔ Study of Producers' Roles	✔ Creative Economy Study, Content Industry Study
Individual Creative Worker	✔ Genius Study, Artistic Individual Study	**Frontier**

In order to elucidate our research interest, we reviewed the previous literature about commercial creativity, and adopted four studies or theories as our research framework.

1. Componential model of Amabile (1988, 1996) considering creativity and work environment. It can be classified as cognitive and social environment approach or composite approach, and takes work environment and personal creativity as factors affecting organizational creativity. It also cites professional ability, creative thinking ability, and motivation as components constructing personal creativity. It explains a mechanism of exerting creativity as follows; first, work environment stimulates personal motivation, which in turn

triggers creativity with help of professional ability and creative thinking ability.

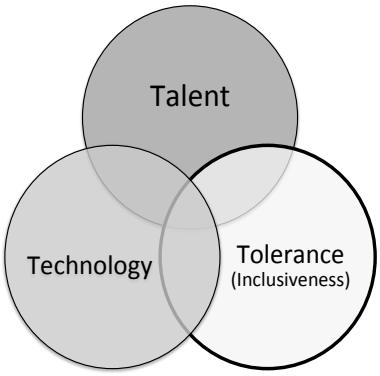
Figure 1. Componential Model

2. Investment model of Sternberg and Lubart (1991) dealing with personal creative talent and behavior.

3. System model and flow theory of Csikszentmihalyi (1999).

4. Creative class theory and remarks to cultural tolerance by Florida (2002, 2014). Florida had engaged in empirical research for long time, and insisted that "creative economy" was the center of economic development of modern society. She also stated that 3Ts – Technology, Talent, and Tolerance were needed for the growth of creative economy.

Figure 2. 3Ts Model



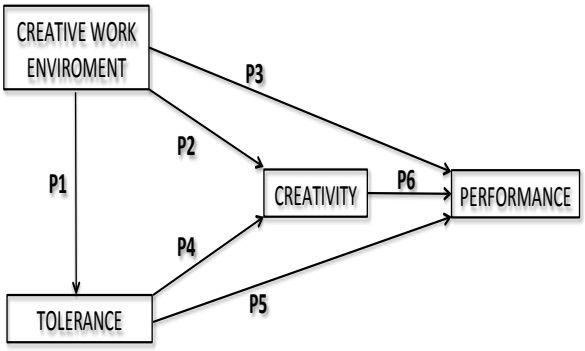
Based on the framework, we refined our research interest into two research questions.

RQ1. How are personal creativity, work environment and tolerance related with the process of improving performance of general creative workers?

RQ2. Is there any difference between the processes of general creative workers (hereafter creative workers) and workers in other industries (general workers)?

For answering these questions, a model composed of creativity, environment, performance and tolerance was constructed (Figure 2). Creativity refers to personal creativity of workers, environment to their work environment, performance to their business performance and tolerance to their cultural/religious tolerance. In addition to this, we also built six propositions. "Environment affects tolerance (P1), creativity (P2) and performance (P3)," "tolerance affects creativity (P4) and performance (P5)", and "creativity affects performance (P6)." The model was applied to creative workers and general workers for exploring their difference.

Figure 3. Performance Model



III. Methods

Our survey method can be described as follows:

・Data collection: Internet survey (conducted by internet survey company M)

・Period: February to March in 2010

・Subjects: General workers and creative workers (workers engaged in creative tasks in creative industries) in Japan

・Valid responses: 2,690 cases

・Sampling method: Stratified random sampling

・Environment Scale: Modified KEYS(1)

・Creativity Scale: WVS(2), FLOW-Q(3), General Risk Aversion Scale(4)

・Tolerance Scale: Heartland Forgiveness Scale(5)

・Performance Measure: Relative performance, Degree of difference

Modified KEYS was adopted for measuring work environment, part of WVS, part of FLOW-Q and whole General Risk Aversion Scale were for creativity, Heartland Forgiveness Scale was for tolerance, which measured internal and external tolerances. The reliabilities of these scales were verified.

Relative performance is a relative income in company, and a degree of difference is a difference between a worker's income and the average income of his/her industry.

Two groups, general worker group (2,575 workers engaging in noncreative jobs in noncreative industries) and creative worker group (115 workers engaging in creative jobs in creative industry) were generated from 3,174 responses. Factor analysis, correlation analysis, multiple regression analysis and path analysis were conducted on them respectively.

The results were evaluated with effect size since the sizes of groups differed largely. We chose an absolute value of a correlation coefficient (|r|) as an effect size for correlation analysis, an absolute value of a standardized regression coefficient (|β|) and a coefficient of determination (R2) for regression analysis, and an absolute value of a path coefficient for path analysis. The criteria used for evaluating the propositions were as follows: Small: |β| = .10, R^2 = .02. Middle: |β| = .30, R^2 = .13. Large: |β| = .50, R^2 = .26 (Cohen 1988). Correlation and path coefficients follow the criteria for |β|.

Lastly, the evaluated effect sizes of both groups were compared to reveal the characteristics of creative workers.

SPSS ver. 21 and AMOS ver. 21 were used for statistical and path analyses respectively. The significance level was set to 0.05.

IV. Results and Discussion

The fundamental statistics of samples are shown in Table 2. Regarding personal information, average ages of all workers, general workers and creative workers were 40.1±8.4, 40.1±8.4, and 39.5±7.3 respectively. Proportions of male workers were 74.8%, 74.8%, and 73.9% respectively. Proportions of married workers were 54.3%, 54.6%, and 55.9% respectively. The most popular residence area was Kanto, a capital metropolitan area of Japan, and 47.7%, 46.8%, and 67.0% of worker groups lived there.

Regarding employment information, permanent employment rates were 92.4%, 92.1%, and 97.4% respectively. Yearly incomes were 4.5 million yen, 4.5 million yen, and 5.5 million yen respectively. Length of working was 12.5 years for all groups. Ordinary employee rates were 53.6%, 53.5%, 54.8% respectively.

Table 2. Fundamental Statistics

		All Workers (n=2690)	General Workers (n=2575)	Creative Workers (n=115)
Personal Information	**Age (m±sd)**	40.1±8.4	40.1±8.4	39.5±7.3
	Gender (% of males)	74.8	74.8	73.9
	Marital Status (% of married)	54.3	54.6	55.9
	Residence Area (%)	Kanto [a)]: 47.7 Kinki [b)]: 16.1 Tokai [c)]: 11.3	Kanto:46.8 Kinki:16.5 Tokai:11.6	Kanto:67.0 Hokkaido [d)], Tohoku [e)]:7.8 Kinki:6.1
Employment Information	**Permanent Employment (%)**	92.4	92.1	97.4
	Yearly Income (million yen, median)	4.5	4.5	5.5
	Length of Working (year, median)	12.5	12.5	12.5
	Position (%)	Ordinary Employee: 53.6 Chief Class:13.9 Manager Class:12.2	Ordinary Employee: 53.5 Chief Class:13.8 Manager Class:12.3	Ordinary Employee: 54.8 Chief Class:15.7 Manager Class:11.3

a)area of Japan including Tokyo,
b)area of Japan including Osaka and Kyoto,
c)area of central Japan including Nagoya,
d)island area of northern Japan including Sapporo,
e)area between Hokkaido and Kanto including Sendai

Then we conducted factor analyses and confirmed factor structures for both groups. Next, we calculated coefficients of correlation, regression and path analyses. and evaluated them with effect size (Table 3). The results showed that creative workers had characteristics different from workers in other industries. Although work environment positively affected creativity, tolerance and performance in both general workers and creative workers, it did more strongly and widely in creative workers. Tolerance did not affect creativity and performance in general workers while it positively did in creative workers. Specifically, "liberalism" positively affected

the relative performance. Creativity did not contribute to performance in both groups.

In other words, the characteristics of high performance creative workers can be described as follow. Note that "open," "supportive" and "challenging" are subscales included in "environment," and "liberalism" is in "tolerance" (Kang and Higashide, 2018).

✓ Their work environment is not "open" and they tend to withdraw inside.

✓ Their work environment is "supportive" and they receive proper support from management.

✓ They are "challenging," passionate for work and positively related with other team members and colleagues.

✓ They prefer "liberalism."

Although we carefully conducted our research, it has three limitations. The first is the disproportion of sample sizes of general workers and creative workers. The former exceeded 2,500, while the latter was only 115. This made the former's statistical tests likelier to be significant than the latter's. In order to ease the problem, we adopted effect sizes, but the limitation of reliability derived from the fewness of the data was not completely solved.

The second is that the scale of creative was composed of items measuring creativity or idea of general workers rather than artistic creativity of creative workers. This might be the reason why we got the result showing that creativity and performance were unrelated.

The third is that although we analyzed the regression relations among factors, we could not clarify the underlying mechanisms or concrete management styles for enhancing performance.

For solving these limitations, we plan to increase samples of creative workers, use a scale measuring artistic creativity of creative workers properly in a future questionnaire survey. Furthermore, we will explore the relations between performance and factors such as creativity, environment and tolerance, and the way of management enhancing performance with an interview survey.

Table 4. Judgment of Propositions

Proposition	Analysis	General Worker		Creative Worker	
		Coeffi-cient	*Effect size*	*Coeffi-cient*	*Effect size*
P1: Environment -> Tolerance	$\|r\|$ [a)]	.099	Small	.132	Small
	$\|\beta\|$ [b)]	.058	Small	.128	Small
	R^2 [c)]	.066	Small	.147	Middle
	$\|p\|$ [d)]	.120	Small	.140	Small
	Judgment	True		True	
P2: Environment -> Creativity	$\|r\|$	.240	Middle	.237	Middle
	$\|\beta\|$	.114	Small	.189	Small
	R^2	.358	Large	.439	Large
	$\|p\|$	.270	Middle	.570	Large
	Judgment	True		True	
P3: Environment -> Performance	$\|r\|$	.172	Small	.117	Small
	$\|\beta\|$	.088	Small	.127	Small
	R^2	.122	Middle	.149	Middle
	$\|p\|$	.050	Small	.020	Small
	Judgment	True		True	
P4: Tolerance -> Creativity	$\|r\|$	.128	Small	.168	Small
	$\|\beta\|$	.058	Small	.102	Small
	R^2	.020	Small	.048	Small
	$\|p\|$	.120	Small	.140	Small
	Judgment	False		True	
P5: Tolerance -> Performance	$\|r\|$	.116	Small	.124	Small
	$\|\beta\|$	.060	Small	.133	Small
	R^2	.020	Small	.110	Middle
	$\|p\|$	.330	Middle	.900	Large
	Judgment	False		True	
P6: Creativity -> Performance	$\|r\|$	.183	Small	.172	Small
	$\|\beta\|$	.080	Small	.123	Small
	R^2	.016	Small	.023	Small
	$\|p\|$	.430	Large	.110	Small
	Judgment	False		False	

a)correlation coefficient (average of absolute values),
b)standardized regression coefficients (average of absolute values),
c)coefficient of determination (average),
d)path coefficient (absolute values).

V. CONCLUSION

Our findings that "work environment is not 'open' and workers tend to 'withdraw inside,'" "work environment is 'supportive' and workers receive proper support from management" were highly unexpected comparing with a general impression of creative workers. Especially 'workers tend to withdraw inside' has not been referred in the previous

literature, thus can be regarded as highly original and innovative finding.

There are few studies based on a questionnaire survey on creators at this point. But some researchers have started to focus on creators and their creativity. Bontje and Rühmann (2008) quantitatively analyzed living environment preference of creative workers. Thompson, Parker and Cox (2015) surveyed characteristics of game creators. Rimscha and Siegert (2011) conducted a survey of characteristics of entertainment media workers (including workers not classified as creators). They implied that creators had characteristics different from other workers, and insisted that management or policy style suited for creators were needed (mainly liberalism-oriented), which are consistent with our findings.

Although we found that support in work environment affected performance, we could not reveal concretely what kind of support was effective. This should be a future research topic.

Lastly, let us discuss an effect size analysis, which we used, but not widely used in business studies. We used the criteria exemplified in the previous literature to judge each proposition. But whether they are suitable for business studies is unknown. In spite of this practical limitation, an effect size analysis enables the comparison of groups with large difference in size, thus could contribute to the development of business studies. We will continue to explore it in future.

Notes on Scales

[1] For observing copyright of the KEYS questionnaire, our questionnaire was reconstructed from the items of the copy free scales, which were similar to KEYS and verified with reliability.

[2] R. Inglehart, B. Puranen, T. Pettersson, J. D. Nicolas, and Y. Esmer. (2000). World Values Survey. [Online]. Available: http://www.worldvaluessurvey.org/WVSDocumentationWV4.jsp, Accessed on: Aug. 29, 2018.

[3] P. L. Mayers, “Flow in adolescence and its relation to school experience,” Ph.D. dissertation, Univ. of Chicago, Chicago, IL, 1978.

[4] A.M. Carter and B. Yeqing, “Exploring the concept and measurement of general risk aversion,” Adv. in Consum. Res., vol. 32, pp. 531-539, 2005.

[5] L. Thompson, C. Synder, and L. Hoffman. “Heartland forgiveness scale,” J. of Pers., vol. 73, pp. 313-359, 2005.

REFERENCES

[1] R. Kang and H. Higashide, "Management that Enhances Performance of Workers in Creative Industries," J. of Jap. Creativity Soc., vol. 21, pp. 76-97, 2017. (Japanese)

[2] Bass, Bernard M., and Bruce J. Avolio. (2000). MLQ, Multifactor Leadership Questionnaire Sampler Set: Technical Report, Leader Form, Rater Form, and Scoring Key for MLQ Form 5x-short. Mind Garden.

[3] Amabile, T. M. (1988). A model of creativity and innovation in organizations. Research in organizational behavior, 10(1), 123-167.

[4] Amabile, T. M. (1996). Creativity in Context: Update to the Social Psychology of Creativity. Westview Press.

[5] Amabile, T. M., Conti, R., Coon, H., Lazenby, J., & Herron, M. (1996). Assessing the work environment for creativity. Academy of Management Journal, 39(5), 1154-1184.

[6] Amabile, T. M. (1998). How to kill creativity. Harvard Business Review. Harvard Business School Publishing, 76(5), 76-87

[7] Amabile, T. M., & Julianna, P. (2012). Perspectives on the social psychology of creativity. Journal of Creative Behavior, 46(1), 3-15.

[8] Baard, P. P., Deci, E. L., & Ryan, R. M. (2004). Intrinsic Need Satisfaction: A Motivational Basis of Performance and Well 寰殖 eing in Two Work Settings. Journal of Applied Social Psychology, 34(10), 2045-2068.

[9] Bilton, C. (2007). Management and Creativity: From Creative Industries to Creative Management. Blackwell Publishing.

[10] Bontje, M., Pethe, H. & R テシ hmann, P. (2008). The Amsterdam region - A home for creative knowledge workers and graduates? Understanding the attractiveness of the metropolitan region for creative knowledge workers. ACRE Report 5.1. Amsterdam: AMIDSt, University of Amsterdam.

[11] Cattani, G., & Ferriani, S. (2005). A Social network perspective on individual creative performance: Evidence from the Hollywood film-making industry, 1992-2003. (A Paper presented at the European Group of Organizational Studies, 21st Colloquium. Freie Universitaet Berlin, Berlin, 30 June - 2 July, 2005.)

[12] Caves, R. E. (2000). Creative industries: Contracts between art and commerce. Harvard University Press.

[13] Chandler, G. N., & Jansen, E. (1992). The founder's self-assessed competence and venture performance. Journal of Business Venturing, 7(3), 223-236.

[14] Csikszentmihalyi, M. (1991). Flow: The Psychology of Optimal Experience. New York: Harper and Row.

[15] Cohen, J. (1988). Statistical power analysis: A computer program. Routledge.

[16] Cohen, J. (1992). A power primer. Psychological Bulletin, 112, 155-159.

[17] Eisenberg, C., Gerlach, R., & Handke, C. (2006). Cultural industries: The British experience in international perspective. Humboldt-Universit テ、t.

[18] Ensor, J., Pirrie, A., & Band, C. (2006). Creativity work environment: do UK advertising agencies have one?. European Journal of Innovation Management, 9(3), 258-268.

[19] Florida, R. (2002). The rise of the creative class: and how it's transforming work, leisure, community and everyday life. Basic Books.

[20] Florida, R. (2005) Cities and the Creative Class. New York: Routledge.

[21] Florida, R., Mellander, C., Stolarick, K., Silk, K., Matheson, Z., & Hopgood, M. (2011). Creativity and prosperity: The 2010 global creativity index. Martin Prosperity Institute.

[22] Florida, R. (2014). The rise of the creative class--revisited: revised and expanded. Basic Books.

[23] Granovetter, M. (1973). The Strength of Weak Ties. American Journal of Sociology. 78. 1360-1380.

[24] Mayers, P. L. (1978). Flow in adolescence and its relation to school experience. Dissertation Abstracts International, 39(1-A), 197-198.

[25] Ottaviano, G. I., & Peri, G. (2006). The economic value of cultural diversity: evidence from US cities. Journal of Economic Geography, 6(1), 9-44.

[26] Rimscha, M. B., & Siegert, G. (2011). Orientations of entertainment media workers: entertainment media workers-disrespect and neglect. Media, Culture & Society, 33(7), 1009-1026.

[27] Runco, M. (2014). Creativity: Theories and themes: Research, development, and practice. Elsevier.

[28] Sternberg, R. J., & Lubart, T. I. (1991). An investment theory of creativity and its development. Human development, 34(1), 1-31.

[29] Thompson, L., Synder C. & Hoffman, L. (2005). Heartland forgiveness scale. Faculty publications. Department of Psychology. 452.

[30] Thompson, P., Parker, R., & Cox, S. (2015). Interrogating Creative Theory and Creative Work: Inside the Games Studio. Sociology, 49(1), 1-17.

[31] T. M. Amabile, "A model of creativity and innovation in organizations," Res. in Organ. Behav., vol. 10, no. 1, pp. 123-167, 1988.

[32] J. Cohen, "Statistical power analysis," Curr. Dir. in Psychol. Sci., vol. 1, no. 3, pp. 98-101, 1992.

[33] J. Cohen, "A power primer," Psychol. Bull., vol. 112, pp. 155-159, 1992.

[34] M. Csikszentmihalyi, Flow: The Psychology of Optimal Experience. New York, NY, USA: Harper and Row, 1991.

[35] G. Okubo and K. Okada, Phychometrics for reporting - Effect size, confidential interval and power. Tokyo, Japan: Keisoshobou, 2012. (Japanese)

[36] A. Mizumoto and O. Takeuchi, "Introduction to effect size and power analysis: for using statistical test correctly," Foreign Lang. Educ. Media Assoc.: Kansai Branch Method. Study Group Rep., pp. 47-73, 2010. (Japanese)

The correlation coefficients for general workers varied from -.058 to .699, all of which were significant ($p<.001$), and those for creative workers varied from -.004 to .746 (Table 3).

Table 3. Correlation Analysis among Factors

		Internal Tole-rance	External Tole-rance	Creativity	Performance
General Workers	Environ-ment	.297***	.024***	.699***	.223***
	Internal Tolerance	1	.127***	.321***	.186***
	External Tolerance		1	.033***	-.058 ***
	Creativity			1	.309***
Creative Workers	Environ-ment	.244	-.004	.746***	.259*
	Internal Tolerance	1	.255	.255***	.339*
	External Tolerance		1	.184***	.135*
	Creativity			1	.253*

*:p<.05, ***:p<.001