



# Idea Generation Among Bank Employees: An exploratory survey

Elvira Tomic, Education, Research & Training Consultants, The Netherlands

## Abstract

The present study investigated where and in what way bank employees generate ideas connected with their work environment. Employees ( $N = 368$ ) were asked about (1) preferred environments, media, people and activities before generating ideas, about (2) environments, time and situation while generating ideas, and (3) what activities they typically and spontaneously do next after they have had an idea. The results show a clear preponderance of significant differences between female and male mean scores with respect to generating ideas. Quite a number of medium to large effect sizes were observed. The study shows that the questionnaire could be used successfully to gather information on the way in which employees generate ideas. It also illustrates the significance of breaking down the process of generating ideas into three episodes or moments, i.e., before, during, and after an idea is created. Important methodological weaknesses observed in prior studies on idea generating were corrected. The study underlines the importance of generating ideas in the work environment. It has produced a few findings that need to be investigated further. The limitations for this study are addressed and the recommendations for future research are detailed.

*Keywords:* creativity, idea generation, preparation, incubation, illumination, verification/revision, bank employees



## Introduction

The aim of the present study is to find out where and in what way bank employees generate ideas connected with their work environment. Neither efficiency nor a high productive capacity is sufficient to guarantee the competitiveness of organizations. To keep up with others and if possible surpass them, organizations need a constant flow of new ideas resulting in new products and services. It is more likely that companies who build innovation capacity into their culture and management systems will be successful (Brandi & Hasse, 2012; Stopford, 1994). Modern management theories therefore stress that managers must inspire their employees to creativity and innovation by creating an environment in which aptitude can be developed, talent is rewarded, and ideas reach maturity (Kotter, & Whitehead, 2010). Sad to say, most managers pay lip service to innovation and generating ideas in their organizations, according to Stevenson, (2012). Likewise, most managers are unable to recognize innovation when it is happening right in front of them (Kuczmariski, 2003). Some managers display what Liu, Iao & Loi (2012) call abusive supervision, meaning the sustained display of hostile, verbal and nonverbal behaviors, excluding physical contact. Fortunately, but very obviously in the minority, there are companies that set aside a certain percentage of their research budgets for what Hammonds (2002) calls “crazy” ideas. The results are noteworthy: about 10% of the ideas generated have been commercialized. An example is 3M’s company policy. Since about 1948 3M researchers have been encouraged to spend 15% of their time working on something other than their primary project (3M, 2012). This supports 3M’s strong product development strategy.

Another illustration of allocating a part of the research budget to employee creativity is Google’s company policy. Employees have the opportunity to work on their own projects on company time. For every hour they spend working for the company, they get 15 minutes to work on their own creative project (Girard, 2009; Walker, 2011).

In a dynamic global economy, creativity and innovation are essential requirements for organizational success. To a larger extent, in today’s turbulent business environment success depends on continually generating new ideas. As an example we mention two large-scale studies in which creativity is underlined. Recently, for instance, Lomax, Wiseman & Parry (2013) conducted a survey among owners of small companies across the UK. The results show that the majority of small business owners acknowledged that generating new ideas is very important.



The owners valued the creative thinking of their employees. In addition, a noteworthy and interesting result of the survey was the comparison between companies with and without innovation. The outcomes show that 45% of those with innovation were in the growth segment, compared to 28% of those that did not have innovative processes. According to a major new IBM survey (2010, 2012) of more than 1,500 Chief Executive Officers from 60 countries and 33 industries worldwide, it is remarkable that CEOs identify creativity as the number one leadership competency of the successful enterprise of the future.

We argue that creativity and innovation are key requirements for success and the growth of organizations. Before we are able to encourage creativity and innovation in the workplace, we must know how people generate ideas connected with their work.

Researchers have attempted to investigate the process of generating ideas. Wallas (1926), who employed a descriptive approach, studied accounts by recognized scientists, geniuses and other innovators. He identified four stages in the general process of idea generation: preparation, incubation, illumination, and verification/revision. Helmholtz (1903), who preceded Wallas, proposed four stages to creativity as well. Hadamard (1949) also identifies the same four distinct stages that seem to occur in every documented case of scientific insight. The four-stage breakdown of the creative process is widely used (Botella, Zenasni & Lubart, 2011; Lubart, 2001; Villalba, 2008).

Apparently, the process of getting an idea goes as follows: First, the person involved senses a need or deficiency, conducts random explorations, and clarifies the problem, i.e., defines the issue, observes, and studies. In this phase he/she formulates the problem. He/she then embarks on a period of preparation accompanied by reading, discussing, exploring, and formulating many possible solutions, and then critically analyzes these solutions for advantages and disadvantages. The preparation phase involves intense effort as the person attempts to solve a given problem. Germination occurs in the incubation phase, when he/she puts the issue aside for a time. Out of all this comes the birth of a new idea - a flash of insight, illumination or the moment when a new idea finally emerges. This is the "Aha" experience. Insight is achieved in the illumination phase. Illumination occurs when the resources fall into place, and a final decision is reached about the result or solution. Finally, the person experiments to evaluate the most promising solution to be selected and perfected. The solution is tested. Verification is the process of making relatively minor modifications before committing ideas to a final form.



In spite of the poor empirical evidence, the Wallas stages are used as the basis for almost all of the systematic, disciplined methods of training throughout the world today (Torrance, 1989; Villalba, 2008). Wallas was an inspiration for researchers in the domain of creativity and similar steps underlie current theories and research attempts.

It has not become any easier to clarify what we mean by getting new ideas. According to Runco & Jaeger (2012), this is partly due to the inherent difficulty of the topic and the lack of scientific attention. Fortunately, there is a growing interest in idea generation as an important component of professional effectiveness. After reviewing several models which include the moment of illumination or the birth of an idea, Geschka (1987) suggests that the process of generating ideas could be broken down into three episodes or moments: the first, preceding the moment of illumination, i.e., *before* the moment of idea creation; the second, *during* the moment of illumination, i.e., the birth of an idea; and third, following the moment of illumination, i.e., *after* idea creation. Although the three episodes do not match the stages proposed by Wallas (1926) perfectly, they are similar to Wallas' proposal. Preparation and incubation are stages before the moment of idea generation, illumination occurs during the moment of idea creation, and verification/revision can be situated in the moment after idea creation.

Applying the three episodes or moments model, Geschka (1987, 1993), Geschka & Mägdenfrau (1992), have done a number of surveys in the field of business and management in Germany, Austria, and Switzerland. Vaags & Douwes-Bolding (1988) replicated Geschka's survey among managers of manufacturing companies and commercial enterprises in The Netherlands. In the United Kingdom the Roffey Park Management Institute carried out a survey among managers (Lammimam & Syrett, 1997). Tomic & Brouwers (1999) conducted a survey among secondary school teachers.

The aim of the above-mentioned studies was to explore how professionals get new ideas related to the requirements of their occupation. A salient characteristic of those studies are their methodological weaknesses. Nevertheless, we have to accept the fact that not much research has been conducted on generating new ideas among individuals in their work situation.

In an extensive and well-organized paper Baer & Kaufman (2008) present a well thought-out review and evaluation of the literature on gender differences and creativity. The authors just



mentioned, give a clear description of gender-based differences which have been observed by researchers in areas such as creativity test scores, creative achievements, and self-reported creativity. It can be concluded that the review by Baer & Kaufman (2008) supports the contention that lack of differences between females and males is the most common outcome of the many studies reported in their article. “It should be noted that if there were to be an overall ‘winner’ in the numbers of studies in which one gender outperformed the other, it would be women and girls.” (p. 98). The outcomes of a more recent study on gender differences and creativity have produced inconclusive results with regards to this issue (Mann, 2014). Her conclusions are in accordance with the Bear & Kaufman literature review (2008).

The purpose of the present study is to gain an understanding of the way bank employees go about getting ideas by investigating where and in what way they generate ideas connected with their work environment. An additional aim of the study is to explore whether there are gender differences related to idea generation. The study focuses on three episodes or moments, i.e., before, during, and after the moment an idea is created. The concept “idea” is used to cover all aspects of employees’ work environments. The main point, however, is that the idea is new for the person in question, and self-invented. Because most of our thinking is solitary, we focus on the individual bank employee, and not on people brought together in groups to share ideas and generate new ones.

The current study also corrects certain methodological weaknesses of the following surveys: Geschka (1987, 1993), Geschka & Mägdefrau (1992), Vaags & Douwes-Bolding (1988), Lammimam & Syrett (1997) and Tomic & Brouwers (1999); that is, a larger sample is used, and Likert response categories are used. Responses in Likert format can, for instance, be subjected to reliability analysis which makes it possible to find groups of items that go together. Instead of discrete, we used continuous variables.

## **Method**

### *Participants*

Individuals eligible for participation in this study were those who worked in four establishments of a merchant bank. After permission was obtained from the personnel department, a staff member provided us with a current directory containing a complete list of employees. A total population of over 800 was targeted. The sample was drawn from a



population of employees who had a permanent position. A simple random sample of 550 individuals received the survey questionnaire distributed by the personnel department.

### *Procedure*

The current study involves a large sample of bank employees who were asked to complete a questionnaire. With the cooperation of the personnel department, those surveyed were sent a survey packet including a questionnaire form, a stamped return envelope, and a cover letter. The letter contained an explanation of the purpose of the questionnaire, an assurance of confidentiality, and the invitation to cooperate in our research. To increase the return rate three weeks after receiving the questionnaire forms, follow-up letters were sent to the participants requesting them to complete the questionnaire. To induce mail survey response rate we followed some appropriate guidelines (Porter, 2004). We also used telephone reminders as Asch, Jedriewski, & Christakis (1997) state that telephone reminders are associated with higher response rates.

### *The questionnaire*

The idea generating instrument was based on a questionnaire designed by Geschka (1987), Vaags & Douwes-Bolding (1988), and on the Tomic & Brouwers (1999) adaptation. The actual items were developed after reviewing previous research. Some modifications and improvements were made. First, the questions had to be tailored to another professional group: bank employees instead of businessmen and secondary school teachers. Second, Likert response categories were used. The items were measured on a 7-point scale, ranging from never to always. Third, instead of discrete, we used continuous variables. Fourth, the questionnaire in the present study explicitly specifies what is meant by a new idea. The questionnaire consisted of 90 items grouped into nine categories. These areas were distilled from the many issues generated by previous research (Wallas, 1926; Geschka, 1987, 1992, 1993; Tomic & Brouwers, 1999). The instrument used was screened by a panel of bank employees and appropriate revisions were effected. To illustrate the nature of the categories of questions, see below. (1) "Other than my home or office, for inspiration about new ideas I go to ..." (2) "For inspiration about new ideas I prefer ..." (3) "When I am stuck for ideas I ..." (4) "I am more likely to get an idea when I am ..." (5) "When I get a new idea I am usually ..." (6) "I get new ideas most frequently ..." (7) "I am more likely to get a new idea when I am ..." (8) "Activities I typically and spontaneously do next after I have had an interesting idea ..." (9) "After I have had an idea that seems worth following up, I take



the following steps ...” The results show (see Tables 1, 2, and 3) that the reliability coefficients of our questionnaire range from .71 to .87, which is quite acceptable for exploratory research (Nunnally & Bernstein, 1994).

## Results

As 550 employees were approached and 368 employees participated, the response rate was 67%, which is not only adequate according to Babbie (1995), but also in accordance with the findings of Asch et al.(1997). The average age of the 368 respondents was 30.98 years. The breakdown of the total sample ( $N = 368$ ) in terms of sex is as follows: male employees 196 (53%), female 172 (47%). There is a significant difference concerning the variable age. On average, male employees are older than their female counterparts:  $t(356) = 39,36; p < .001$ . The representation of male and female employees in higher positions is disproportionate. The number of female employees in higher positions is smaller:  $\chi^2_{(3)} = 29.01; p < .001$ .

We used two methods of estimation concerning non-response bias. First, we compared our sample with a known value for the population, in this instance gender. Given that there is a current and accurate listing of one of the demographic characteristics of the target bank employees relevant to our study, i.e., sex, it is possible to use this characteristic and to compare the sample of the present study with the population to determine its actual representativeness. A comparison with all the employees working in the four establishments shows that our sample was representative in terms of sex ( $\chi^2_{(1)} = .80, p = .37$ ).

Second, we used an extrapolation method and compared the first wave of respondents with the second wave (Anderson & Overton, 1977). The latter refers to the response generated by follow-up letters/emails. There is no significant difference in mean age of the first ( $N = 251$ ) and second wave ( $N = 117$ ):  $t(366) = .322, p > .05$ . We also determined the percentage of males and females in the different age groups of the first and the second wave. The proportion of males in the age groups is not significantly different to the proportion of females:  $\chi^2_{(1)} = .14, p > .05$ . As the tests resulted in no difference in the responses between early and late respondents, therefore, the conclusion was that no non-response bias existed.

An independent-samples t-test was conducted to compare the scores for male and female employees. Because the study involved more than one test, we adjusted the alpha level



downward to consider chance capitalization (Sankoh, Huque, & Dubey, 1997; Tabachnik & Fidell, 1996). For this reason, we will only report values equal to or higher than .01. Percentages of employees, means and standard deviations for the entire group for all variables are presented in Tables 1, 2, and 3, together with the means and standard deviations of male and female employees. T-tests are also displayed and. Following Cohen (1988), Tables in the far right-hand column, also show effect sizes ( $\eta^2$ ) so that it can be seen what percentage of the variability in the dependent variable can be explained or accounted for by the variable sex. Cohen (1988) proposed guidelines for interpreting eta squared: .01 means a small effect, .06 a moderate, and .14 means a large effect.

### **Before the Moment of Idea Generation**

First, we asked employees about preferred environments, media, people and activities before the moment of idea generation. When employees were asked where they go for inspiration about new ideas other than their homes or offices, a considerable number of them said they went to a book store (31.5%). They also visit the open countryside (18.5%). Female employees scored significantly higher than their male counterparts,  $t(366) = 7.05$ ,  $p = < .001$ . The effect size for this difference in “Other than my home or office, for inspiration about new ideas I go to the open countryside” was in the medium to large range ( $\eta^2 = .12$ ). Expressed as a percentage, 12% of the variance in the variable “I go to the open countryside” is explained by sex. For reasons of economy, we will not report each variable in the foregoing manner, but refer instead to Tables 1 to 3, where the mean scores, SD's, t-tests, degrees of freedom, and  $\eta^2$  are displayed.

Employees also go to a library or reading room (17.4%). The mean score on the latter variable is significantly higher for female employees. Employees also visit exhibitions or museums (16.8%). Employees seldom visit a shopping mall, but when they do, females do so more often than males.

When the employees were asked what media they prefer for inspiration about new ideas, they cited periodicals (89.7%), television and radio (73.3%) and daily newspapers (69.1%).

When employees are stuck for ideas they read newspapers (72.3%), think of other things (69.0%), talk to someone (69.0%), watch television or listen to the radio (73.3%), listen to music (66.3%), drink coffee or tea (60.8%), and read books not related to the problem (60.3%). For the



record, these are just the most frequently chosen variables in this category. The mean scores on most of the variables in this category are significantly higher for females.

TABLE 1. A Survey of Bank Employees' Preferred Conditions, Ambience Environments, Media, and Activities *Before* the Moment of Idea Generation: Alpha Coefficients, Mean Scores and Standard Deviations of the Entire Group, Male and Female Employees, T-tests, and Eta's Squared

	$\alpha$	Employees' Scores								
		N=368		Male n=196		Female n=172		t-tests		$\eta^2$
		Percentage Employees <sup>1</sup>	M	SD	M	SD	M	SD	(df=366)	
<b><i>Other than my home or office, for inspiration about new ideas I go to</i></b>	.87									
A book store		31.5	1.63	1.31	1.53	1.42	1.74	1.16	1.58	.01
The open countryside		18.5	1.46	1.43	.99	1.07	2.00	1.59	7.05***	.12
Exhibitions or museums		16.8	1.24	1.18	1.19	1.29	1.30	1.04	.89	.00
A library or reading room		17.4	1.07	1.34	.82	1.23	1.35	1.39	3.85***	.04
A theater, concert, cinema or other entertainment venue		9.8	1.05	1.17	.91	1.24	1.21	1.06	2.50*	.02
A shopping mall		8.2	1.03	1.31	.79	1.17	1.31	1.40	3.90***	.04
<b><i>For inspiration about new ideas I prefer</i></b>	.73									
Periodicals		89.7	3.70	1.11	3.70	1.06	3.69	1.16	.15	.00
Television and radio		73.3	3.43	1.50	3.30	1.59	3.59	1.37	1.92	.01
Daily newspapers		69.1	3.13	1.46	3.29	1.59	2.95	1.26	2.23*	.01
<b><i>When I am stuck for ideas I</i></b>	.83									
Read the newspaper		72.3	3.16	1.60	2.70	1.65	3.69	1.35	6.26***	.10
Think of other things		69.0	3.15	1.49	2.94	1.54	3.40	1.39	2.97**	.02
Talk to someone		69.0	3.07	1.57	2.76	1.73	3.43	1.28	4.28***	.05
Watch television or listen to the radio		73.3	3.02	1.51	2.66	1.58	3.43	1.32	5.06***	.06
Listen to music		66.3	2.87	1.46	2.73	1.47	3.03	1.44	1.97*	.01
Drink coffee or tea		60.8	2.78	1.68	2.45	1.61	3.15	1.69	4.07***	.04
Read books not related to the problem		60.3	2.69	1.52	2.53	1.65	2.87	1.33	2.19*	.01
Think things over		48.8	2.59	1.57	2.43	1.42	2.77	1.71	2.04*	.01
Have a little rest		36.9	1.99	1.52	1.96	1.56	2.02	1.47	.40	.00
Play sports		33.1	1.91	1.30	1.73	1.36	2.10	1.20	2.76*	.02
Go for a walk or a bicycle ride		32.0	1.78	1.42	1.58	1.40	2.01	1.41	2.93**	.02
Do housework		31.0	1.77	1.39	1.49	1.25	2.09	1.47	4.20***	.05
Get some sleep		25.6	1.58	1.62	1.34	1.64	1.85	1.55	3.08**	.02
Smoke		30.5	1.39	1.90	1.28	1.81	1.51	2.00	1.18	.00
Drink beer or other alcoholic beverages		14.7	.83	1.39	.94	1.59	.71	1.12	1.58	.01
<b><i>I am more likely to get a new idea when I am</i></b>	.80									
Under pressure of time		89.7	3.82	1.24	3.87	1.36	3.76	1.10	.85	.00
Doing other work		83.2	.32	1.37	3.39	1.31	3.24	1.43	1.00	.00
Alone		63.1	3.20	1.71	2.92	1.97	3.52	1.27	3.54***	.03
Working on another problem, not related to the idea		76.6	3.11	1.35	3.06	1.42	3.16	1.26	.72	.00
With other people		48.4	2.33	1.53	2.06	1.65	2.64	1.32	3.72***	.03
In a bustling environment		39.6	1.93	1.47	1.44	1.34	2.50	1.40	7.41***	.13

<sup>1</sup> Percentages do not add up to 100. \*p < .05, \*\*p < .01, \*\*\*p < .001

Employees are more likely to get a new idea when they are under pressure of time (89.7%), doing other work (83.2%), when they are alone (63.1%), and when working on another problem, not



related to the idea at all (76.6%). Women score significantly higher on the variables when they are alone, when they are with other people, and in a bustling environment.

#### *During the Moment of Idea Generation*

Second, bank employees were asked about environments, time and situation while generating an idea. Employees thought of ideas while lying in bed (79.9%). They said that when they get an idea, they are usually on their way to the bank or on their way home (73.9%). They also said that they were in their car or another vehicle (73.4%). They found sitting at their desk in the office (64.8%) helpful for generating ideas, just like walking or cycling (43.4%). Female employees scored significantly higher on the latter two variables. Further, inspection of the data shows, first of all, that female employees get ideas while doing housework more frequently than their male counterparts; second, while walking or bicycle riding, third, in a café or espresso bar, and fourth, while working in the garden. The four variables just mentioned were the ones selected least frequently by the entire group ( $N = 368$ ).

The study also looked at the time of idea generation. When employees were asked to estimate when they generate ideas most frequently, i.e., the most fruitful part of the twenty-four hour period, they said early in the morning (59.8%). A substantial percentage of employees reported getting inspiration during the late evening (56.6%), and in the afternoon (58.2%). A considerable percentage of employees reported in bed, before falling asleep (55.5%), and in the middle of the night (44%). The last two findings apply more to female than to male employees.

One other item in the questionnaire asked in which situation employees were more likely to get an idea. The majority of employees preferred to be alone when getting an idea (90.2%), and some favored being with other people (80.9%). Employees generate more ideas when working on a problem (87.0%), and when doing other work (70.1%). It makes a difference to them whether they are working under pressure of time or not (72.8% and 56.0% respectively). More than half of employees prefer a bustling environment (52.1%). With the exception of the variable alone, female employees scored significantly higher on all the other variables in this category.

#### *After the Moment of Idea Generation*

Third, we investigated what activities bank employees typically and spontaneously do next after they have had an idea.

TABLE 2. A Survey of Employees' Environment, Time and Situation *During* The Moment of Idea Generation: Alpha Coefficients, Mean Scores and Standard Deviations of the Entire Group, Male and Female Employees, T-tests, and Eta's Squared

	Employees' Scores									
	$\alpha$	Percentage Employees <sup>1</sup>	N=368		Male n=196		Female n=172		t-tests	
			M	SD	M	SD	M	SD	(df=366)	$\eta^2$
<b><i>When I get a new idea I am usually</i></b>	.81									
In bed		79.9	3.41	1.68	3.31	1.85	3.53	1.46	1.30	.00
On my way to the bank or on my way home		73.9	3.35	1.16	3.24	1.02	3.47	1.30	1.17	.00
In my car or another vehicle		73.4	3.19	1.33	3.07	1.29	3.33	1.37	1.83	.01
At my desk in the office		64.8	2.79	1.29	2.58	1.47	3.02	1.00	3.32***	.03
Walking or bicycle riding		43.4	2.27	1.48	2.01	1.69	2.57	1.14	3.76***	.03
In the bathroom		29.3	2.07	1.81	2.04	1.71	2.10	1.93	.33	.00
At my desk at home		29.4	2.05	1.32	2.21	1.40	1.87	1.20	2.52*	.02
In the open countryside		32.6	1.83	1.53	1.38	1.43	2.35	1.48	6.39***	.10
Attending a seminar		31.5	1.75	1.59	1.83	1.79	1.66	1.31	.98	.00
On the toilet		29.4	1.75	1.46	1.68	1.29	1.83	1.64	.91	.00
Doing housework		20.1	1.32	1.42	1.09	1.18	1.58	1.61	3.27***	.03
In a café or espresso bar		10.4	1.00	1.10	.66	.89	1.38	1.20	6.47***	.10
Working in the garden		10.9	.88	1.11	.85	1.01	.91	1.23	.51	.00
<b><i>I get good ideas most frequently</i></b>	.71									
Early in the morning		59.8	2.99	1.58	3.00	1.68	2.99	1.46	.07	.00
In bed, before falling asleep		55.5	2.79	1.62	2.46	1.70	3.16	1.43	4.31***	.05
In the evening		56.6	2.58	1.37	2.70	1.43	2.44	1.29	1.83	.01
In the afternoon		58.2	2.43	1.45	2.47	1.52	2.38	1.36	.56	.00
In the middle of the night		44.0	2.08	1.81	1.71	1.63	2.49	1.93	4.13***	.04
<b><i>I am more likely to get an idea when I am</i></b>	.83									
Alone		90.2	3.97	1.16	4.02	1.18	3.92	1.15	.83	.00
Working on a problem		87.0	3.72	1.32	3.42	1.53	4.07	.91	5.02***	.06
With other people		80.9	3.42	1.10	3.28	1.15	3.58	1.02	2.67*	.02
Under pressure of time		72.8	3.21	1.40	2.87	1.49	3.59	1.19	5.18***	.07
Doing other work		70.1	3.12	1.31	2.65	1.27	3.66	1.13	7.99***	.15
In a bustling environment		52.1	2.55	1.26	2.18	1.16	2.97	1.26	6.17***	.10
Not under pressure of time		56.0	2.40	1.22	2.18	1.48	2.65	.76	3.88***	.04

<sup>1</sup> Percentages do not add up to 100. \*p < .05, \*\*p < .01, \*\*\*p < .001

A wide majority of employees preferred discussing the idea with their colleagues (84.2%). The other main spontaneous activities are talking to someone about the idea (78.8%), something female employees are significantly more likely to do. Respondents report that activities they typically and spontaneously do next after they have had an interesting idea are thinking about the idea again and again (72.3%), estimating the value of the idea (74.5%), and writing down the idea immediately (65.8%). The mean score of female employees was significantly higher on this variable. Employees further mentioned drawing up a plan to develop the idea further (59.2%).



Respondents also reported that they discussed the idea with their superior officer (66.9%); male employees had a significantly higher score on the latter variable. Respondents also mentioned developing the idea in more detail (56.6%). Successively, Table 3 shows that female employees have significantly higher mean scores on the variables getting something to drink, performing a routine job not related to the idea at all, and going to the open countryside.

What steps do employees take next after they have had an idea that seems worth following up? An overwhelming majority of employees preferred to talk to others to test the idea (91.4%). A substantial number of respondents were interested in how other persons would react to the idea (80.5%), reported that they develop the idea in further detail (77.1%), and planned all further activities (57.0%). Respondents also search for facts, literature and other information supporting the idea (65.2%), talk to their spouses or partners (64.6%), with women doing this more often than men, and to experts (59.8%) and friends (52.2%).

Finally, we asked the bank employees two questions: first, whether ideas occur to them suddenly, and second, whether ideas become gradually more concrete. There is a difference between these two alternatives. Whereas 77.1% reported that an idea gets gradually more concrete, 87% of the respondents had an idea come to them suddenly. Women reported the latter significantly more often than men.

Looking at the magnitude of the differences in the mean scores, it can be concluded from the Tables that there are nine effect sizes in the medium to large range .09 to .13, and one effect size of .15.

## **Discussion**

The study investigated where and in what way bank employees generate ideas connected with their work environment. To our knowledge this is the first study ever to investigate this issue.

The concept “idea” was used to cover all aspects of employees’ work environment. Ideas are new for the person in question, and self-invented. Because most of our thinking is solitary, the study focused on the individual bank employee, and not on people brought together in groups to share ideas and generate new ones.

TABLE 3. A Survey of Bank Employees' Activities and Next Steps *After* the Moment of Idea Generation: Alpha Coefficients, Mean Scores and Standard Deviations of the Entire Group, Male and Female Employees, T-tests, and Eta's Squared Employees' Scores

	$\alpha$	Percentage Employees	N=368		Male n=196		Female n=172		t-tests	$\eta^2$
			M	SD	M	SD	M	SD		
<i>Activities I typically and spontaneously do next after I have had an interesting idea</i>	.84									
Discuss the idea with my colleagues		84.2	3.42	1.41	3.46	1.58	3.37	1.18	.60	.00
Talk to someone who's around about the idea		78.8	3.33	1.43	3.10	1.55	3.59	1.24	3.37***	.03
Think about the idea again and again		72.3	3.29	1.61	3.33	1.47	3.26	1.77	.41	.00
Estimate the value of the idea		74.5	3.18	1.72	3.20	1.68	3.16	1.77	.23	.00
Write down the idea immediately		65.8	2.94	1.80	2.51	1.57	3.43	1.91	4.99***	.06
Draw up a plan to develop the idea further		59.2	2.75	1.35	2.86	1.08	2.63	1.60	1.59	.01
Discuss the idea with my superior officer		66.9	2.70	1.28	2.86	1.21	2.51	1.34	2.58**	.02
Develop the idea further in detail		56.6	2.56	1.50	2.61	1.25	2.50	1.74	.70	.00
Get something to drink		48.4	2.44	1.76	2.18	1.62	2.73	1.87	2.98**	.02
Perform a routine job not related to the idea at all		26.1	1.44	1.54	.94	.99	2.01	1.83	6.87***	.11
Recall the idea and write it down the next day		22.9	1.32	1.58	1.34	1.73	1.29	1.40	.28	.00
Go for a short walk		21.2	1.31	1.47	1.19	1.58	1.44	1.32	1.62	.01
Go shopping		24.5	1.16	1.51	.99	1.36	1.35	1.65	2.25*	.01
Go to the open countryside		18.5	.92	1.44	.72	1.20	1.15	1.64	2.81**	.02
Go to the library		8.7	.77	1.09	.83	1.16	.71	1.00	1.03	.00
Go to a theatre, concert or cinema		9.2	.66	1.12	.73	1.06	.57	1.19	1.39	.01
<i>After I have had an idea that seems worth following up, I take the following steps next</i>	.80									
Talk to others to test the idea		91.4	3.84	1.25	3.85	1.28	3.86	1.23	.25	.00
Wonder how other persons concerned will react to the idea		80.5	3.47	1.26	3.43	1.26	3.51	1.26	.63	.00
Develop the idea further in detail		77.1	3.17	1.24	3.13	1.17	3.22	1.31	.68	.00
Plan all further activities to develop the idea further		57.0	3.04	1.35	3.16	1.27	2.91	1.43	1.89	.01
Talk to my spouse or partner		64.6	2.99	1.68	2.64	1.63	3.40	1.63	4.40***	.05
Search for facts, literature and other information supporting the idea		65.2	2.97	1.24	2.93	1.15	3.01	1.34	.64	.00
Talk to experts about the idea		59.8	2.90	1.59	3.09	1.38	2.69	1.78	2.41*	.01
Talk to friends		52.2	2.34	1.61	2.49	1.54	2.16	1.69	1.94	.01
Catch up on routine activities to create some distance between myself and the idea		29.4	1.93	1.36	1.93	1.38	1.94	1.34	.09	.00
Talk to other relatives		22.3	1.30	1.56	1.27	1.55	1.35	1.57	.51	.00
An idea arises suddenly		87.0	3.67	1.14	3.33	1.17	4.07	.96	6.64***	.11
An idea gets gradually more concrete		77.1	3.57	1.43	3.68	1.29	3.44	1.56	1.60	.01

<sup>1</sup> Percentages do not add up to 100. \*p < .05, \*\*p < .01, \*\*\*p < .001

The main outcomes of the present study can be summarized in the following points: The study shows that the questionnaire originally used by Geschka (1987) could be applied successfully to gather information on the way in which employees generate ideas. The study also illustrates the significance of breaking down the process of generating ideas into three episodes or moments, i.e., before the moment of illumination or idea creation, during the moment of



illumination, and after the moment of idea creation. We have every reason to assume that the notion of three episodes can be used fruitfully in future research in this field.

One important issue in the current study was that we tried to correct serious methodological weaknesses observed in prior studies on idea generating (Geschka, 1987, 1993; Geschka & Mägdefrau, 1992; Vaags & Douwes-Bolding, 1988; (Lammimam & Syrett, 1997; Tomic & Brouwers, 1999). Corrections appeared to be a significant improvement.

We began this investigation with a look at the entire group of bank employees ( $N = 368$ ). The difference between male and female employees was examined with respect to generating ideas. The overwhelming impression one gains is that there is a clear preponderance of significant differences between female and male mean scores. On all but four items female employees scored significantly higher than their male counterparts. We observe quite a number of medium to large effect sizes. For inspiration about new ideas women more than men prefer to be in a different environment other than their home or office. Women talked more about ideas with their spouse or partner than men did. However, male employees discussed their idea with their superior officer more frequently than their female colleagues did. Women discussed their ideas with experts less often than their male counterparts.

A comparison with the results of prior research on generating ideas is hardly possible, because the studies concerned (Geschka, 1987, 1993;, Geschka & Mägdefrau, 1992; Vaags & Douwes-Bolding, 1988; Lammimam & Syrett, 1997; Tomic & Brouwers, 1999) used discrete variables, whereas in the present study the items were measured on a 7-point scale. In the current study when respondents were stuck for ideas, 32% went for a walk or bicycle ride. We came across one study in which creative inspiration improved while a person was walking and shortly thereafter (Opezzo & Schwartz, 2014).

Although more research is necessary to understand the process of idea generation (for instance, how good and usable ideas develop), the findings in this paper have implications for the debate on how to foster idea generating in people's work environment, and how to encourage employees in this regard. One important factor that underlines the importance of idea generating in the work environment is that companies and employers in general expect more and more from their employees. To a large extent, a company's survival depends on its employees' efforts,



expertise and, above all, creativity. Through understanding the aforementioned findings management should be better able to take appropriate steps in ensuring that creativity is fostered rather than muffled. One important way to solve problems in the work environment is by generating new ideas and solutions. Suitable solutions are often based on revised or new ideas; consequently they are indispensable. It is therefore not only worthwhile to investigate how employees generate new ideas and solutions, but also to foster this creative skill.

We can hardly mention a human characteristic that is more inextricably bound up with human existence than creativity, which encompasses the process of generating new ideas. Generating new ideas and finding new solutions are essential for surviving and vital to the development of mankind.

The following limitations may have influenced the results of the current study. First, the data was gathered only from employees in one merchant bank. While this is valuable, it also limits generalizability. Second, the questionnaire is a self-report instrument and was designed solely for the purpose of the current study and therefore is limited with regard to its validity and reliability.

In spite of its limitations, our study has several important strengths. First, our study includes a large sample size and a sufficient response rate. A response rate which exceeds 67% on a survey provides a strong assurance that the results are not seriously biased by the lack of response from a substantial portion of the employees. Second, a comparison with all the employees working in the four establishments shows that our sample was representative in terms of sex. Third, the current study ventured into a novel domain of how bank employees generate ideas connected with their work environment. Fourth, measurement error was contained since the study employed an instrument with quite acceptable internal consistency coefficients. Both internal and external validity was guaranteed. The results of the study can be viewed with a reasonably high degree of confidence.

However, the value of increasing our understanding about generating ideas outweighs the limitations of the study. Overall, we feel that the results are of specific interest and contribute to our knowledge about idea generating. The findings of the present survey could be used to generate hypotheses for further research.



Besides the above-mentioned results, the present study has produced a few findings that require further investigation. First, when respondents were asked in what situation they are more likely to get a new idea before the moment of idea generation (illumination), they not only reported when they are alone, but also when they are with other people and in a bustling environment. This seems like a contradiction. Second, there is the situation in which idea generation takes place, i.e., under pressure or not under pressure of time. On the one hand, employees have a slight preference for generating ideas when under pressure of time (almost 73%), but on the other, 56% preferred not being under pressure of time. Third, there is the way ideas arise: suddenly or gradually. The difference is a mere 10% in favor of ideas arising suddenly. Finally, future research should preferably elucidate whether educational background, position in organization and age have an effect on idea generation.

A promising development for generating ideas and creating inspiration is an experiment in which pupils were provided with the technology (voice recorders and video equipment) with which to record their everyday environment and to help them to focus their attention on the various problems they face in their lives. The primary school class was not only keen to seek out problems but provided several fanciful and occasionally practical solutions (Crook & Harrison, 2014).

## References

- Anderson, J. S., & Overton, T. S. (1977). Estimating nonresponse bias in mail surveys. *Journal of Marketing Research*, 14, 396-402.
- Asch, D. A., Jedrzejewski, M. K., & Christakis, N. A. (1997). Response rates to mail surveys published in medical journals. *Journal of Clinical Epidemiology*, 50(10), 1129-1136.
- Babbie, E. R. (1995). *Survey research methods*. Belmont, CA.: Wadsworth.
- Baer, J., & Kaufman, J. C. (2008). Evidence of gender differences in creativity. *The Journal of Creative Behavior*, 42(2), 78-105.
- Botella, M., Zenasni, F., & Lubart, T. (2011). A dynamic and ecological approach to the artistic creative process of arts students: an empirical contribution. *Empirical studies of the arts*, 29(1), 17-38.
- Brandi, U., & Hasse, C. (2012). Employee-driven innovation and practice-based learning in organizational cultures. In S. Høyrup, C. Hasse, M. Bonnafous-Boucher, K. Møller, M.



- Lotz (Eds), *Employee-Driven Innovation: A New Approach*, pp. 127-148. Basingstoke, UK: Palgrave Macmillan.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Erlbaum.
- Crook, C., & Harrison, C. (2014). Children as inventors: orchestrating an informal pedagogic scenario with digital resources. *International Journal of Technology Enhanced Learning*, 6, 21-33.
- Geschka, H. (1987). *A survey among managers in the Federal Republic of Germany, in Switzerland and Austria on the generation of ideas*. Paper for the First European Congress on Creativity and Innovation. Noordwijk: Holland.
- Geschka, H., & Mägdefrau, H. (1992). How businessmen generate ideas: Results of a European survey and comparison with a Japanese poll. *Creativity and Innovation Management*, 1, No. 1, 14-19.
- Geschka, H. (1993). The Development and Assessment of Creative Thinking techniques: A German Perspective. In: Isaksen, S.G. et al. (Eds.), *Nurturing and developing creativity: The Emergence of a discipline*. Norwood: Ablex.
- Girard, B. (2009). *The Google way. How one company is revolutionizing management as we know it*. San Francisco, CA: No Starch Press.
- Hadamard, J. (1949). *An essay on the psychology of invention in the mathematical field*. Princeton, N.J.: Princeton University Press.
- Hammonds, K.H. (2002). Size is not a strategy. *Fastcompany*, 62, 78-83.
- Helmholtz, H.L.F. (1903). *Vorträge und Reden*. [Lectures and speeches]. Braunschweig: Vieweg.
- IBM. (2010). *IBM's biennial global CEO study series*. IBM Global Business Services, Somers: NY, U.S.A.
- IBM. (2012). *Where ideas come from. Developing and leveraging a creative culture*. IBM Corporation, Somers: NY, U.S.A.
- Kotter, J. P., & Whitehead, L. A. (2010). *Buy-In: Saving your good idea from getting shot down*. Boston, MA: Harvard Business Press.
- Kuczumarski, T. D. (2003). "What is innovation? And why aren't companies doing more of it?", *Journal of Consumer Marketing*, 20(6), 536-541.
- Lammimam, J., & Syrett, M. (1997). *Innovation at the top: Where do directors get their ideas from?* London: Roffey Park Management Institute.
- Liu, D., Iao, H., & Loi, R. (2012). The dark side of leadership: A three-level investigation of the cascading effect of abusive supervision on employee creativity. *Academy of Management Journal*, 55(5), 1187-1212.



- Lomax, S., Wiseman, J., & Parry, E. (2013). Small Business Survey – Growth Special Report. Department for Business, Innovation and Skills, London: UK.
- Lubart, T. I. (2001). Models of the creative process: Past, present and future. *Creativity Research Journal*, 13(3&4), 295-308.
- Mann, N. B. (2014). Signature strengths: Gender differences in creativity, persistence, prudence, gratitude, and hope. Dissertation Prescott Valley, AZ, United States: Northcentral University.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory*. (Third Edition Ed.). New York, NY: McGraw-Hill.
- Oppezzo, M., & Schwartz, D. L. (2014, April 21). Give Your Ideas Some Legs: The Positive Effect of Walking on Creative Thinking. *Journal of Experimental Psychology: Learning, Memory, and Cognition*. Advance online publication. <http://dx.doi.org/10.1037/a0036577>
- Porter, S. R. (2004). Raising Response Rates: What Works? In: S. R. Porter (Ed.). *Special Issue: Overcoming survey research problems. New Directions for institutional research*, 121, 5-21.
- Runco, M. A., & Jaeger, G. J. (2012). The standard definition of creativity. *Creativity Research Journal*, 24(1), 92–96.
- Sankoh, A. J., Huque, M. F., & Dubey, S. D. (1997). Some comments on frequently used multiple endpoint adjustments methods in clinical trials. *Statistics in Medicine*, 16, 2529-2542.
- Stevenson, B. W. (2012). Application of systemic and complexity thinking in organizational development. *Emergence: Complexity & Organization*, 14 (2), 86-99.
- Tabachnik, B. G., & Fidell, L. S. (1996). *Using multivariate statistics*. (3rd Ed.). New York: Harper Collins College Publishers.
- 3M. (2012). *A culture of innovation*. St. Paul, MN: Corporate Headquarters 3M Center.
- Tomic, W., & Brouwers, A. (1999). Idea generating among secondary school teachers. *Creativity and Innovation Management*, 8, 262-268.
- Torrance, E. P. (1988). The nature of creativity as manifest in its testing. In R.J. Sternberg (Ed.), *The nature of creativity. Contemporary psychological perspectives*, pp. 43-75. Cambridge: Cambridge University Press.
- Vaags, W., & Douwes-Bolding, M. (1988). *Een (inter)nationaal onderzoek naar het ontstaan van ideeën*. [An (inter)national survey on idea generation]. Eindhoven: Technische Universiteit Eindhoven [Technical University Eindhoven].



International Journal of Innovation, Creativity and Change. [www.ijicc.net](http://www.ijicc.net)  
Volume 1, Issue 4, November, 2014

- Villalba, E. (2008). *On Creativity. Towards an Understanding of Creativity and its Measurements*. Joint Research Centre, Luxembourg: Office for Official Publications of the European Communities.
- Walker, A. (2011). 'Creativity loves constraints': The paradox of Google's twenty percent time. *Ephemera* 11(4), 369-386.
- Wallas, G. (1926). *The art of thought*. New York: Harcourt Brace.



International Journal of Innovation, Creativity and Change. [www.ijicc.net](http://www.ijicc.net)  
Volume 1, Issue 4, November, 2014