Article

The Sustainability of Creativity

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Abstract: Creativity is a critical element of sustainable development. In current paper it is described through Social Identity by identifying the main factors that shape the background of creativity. We conclude that health, maturity, and positive attitudes of cultural change as well as the social stability, the environmental care and finally, the incentives, material and non-material, shape the human creative dynamism.

Keywords: creativity; culture; Greece

1. Introduction

The concept of creativity refers to the development of a new product, service or means of solving a problem and it is highly important for both the individual and society in general [37]. Cultural background includes social beliefs, customs, systems of sanctions and rewards, and social institutions [15, 84]. It is fostered and promoted through social learning [6] and social interactions. Sustainability of economic development is a major issue of policy making as new creative ideas must be applied in order to achieve sustainable development. A culture that focuses to sustainability goals embeds creativity as well because it is a critical factor of change, after all, creativity and sustainability are closely linked [16]. On the other hand, the development of the social background hinges on human inventiveness and creativity. The development of the social background hinges on human inventiveness and creativity.

In economic science, creativity is an essential component of development and entrepreneurship [2, 28, 67, 87, 108] It is probably the basic source of business ideas responsible for the successful growth of the economy. At times (like today) characterized by conditions of intense uncertainty and low nominal returns, the creative function plays an important part as it seeks out (rare) business opportunities and contributes to their successful implementation. Creative individuals are the ones who bring about a productive change in the system.

This paper attempts to quantify creativity and the factors shaping it in relation to Greek society, utilizing empirical field research data from the two-year period 2019–2020. It is noted that the behavioral profile of 2020, despite displaying certain effects from the COVID-19 crisis, shows a comparative stability in relation to that of 2019, [80] mainly due to the widely held conviction that COVID-19 is a short-term crisis.

Usually, creativity is approached through the observation of individual (psychological) traits [3]. Here, a wider approach to the factors impacting creativity is selected, through social identity theory. A similar approach has been attempted in the past [34] focusing on those traits of social groups which shape creativity and how it is received by the environment. Next, the behavioral profile is elaborated of (Greek) society, as it is affected by objective factors (education, age, etc.) and its influence on creativity is discussed.
The Econometric Procedure of "The Sustainability of Creativity"

This is the detailed econometric procedure followed to reach the conclusions in the paper "The Sustainability of Creativity". Table 1 contains the questions describing social identity and are twenty-six in number. Because the explanatory variables are complex so, to simplify them, use is made of Principal Component Analysis (PCA), which results appear in Table 2. The results of the regression are shown in Table 3, please note that we take 5% as an acceptable level of statistical significance. In Table 4 we used as independent variables those with a loading greater than 0.30 and belonging to statistically significant PC (level of significance 5%) we ran a regression in relation to creativity. The regression indicates the inclusion of many variables which have no statistical significance. We therefore eliminate all the variables which are not statistically significant at 5% and redefine the regression. The results are shown in Table 5.

Table 1. The Variables of Identity.

| Q  | Name of Variable | Question                                                                 | Scale of Answers and Quantification |
|----|------------------|--------------------------------------------------------------------------|-------------------------------------|
| 1. | Degree of Satisfaction and Individual State | | |
| 1  | Happiness        | In general, how happy would you say you are?                            | Scale from "Perfectly Unhappy" to "Exceptionally Happy" |
|    |                  |                                                                          | Scale from 0 to 10                  |
| 2  | Satisfaction     | Overall, how satisfied are you with your life today?                     | Scale from "Perfectly Dissatisfied" to "Exceptionally Satisfied" |
|    |                  |                                                                          | Scale from 0 to 10                  |
| 3  | State of Health  | What would you say is the state of your health overall?                 | Very good, good, average, poor, very poor |
|    |                  | Would you say it is...                                                   | 1,2,3,4,5 (respectively)           |
| 4  | Security         | It is important for the respondent to live in a safe environment.        | Extremely so, Yes it’s important, It’s somewhat important, A little, Not important, Not at all important |
|    |                  |                                                                          | 1,2,3,4,5,6 (respectively)         |
| 2. | Identity Traits  | | |
| 2.1| Basic Traits     | | |
| 5  | Equitability     | The respondent believes it is important that all the people in the world are treated equitably. | Extremely so, Yes it’s important, It’s somewhat important, A little, Not important, Not at all important |
|    |                  |                                                                          | 1,2,3,4,5,6 (respectively)         |
| 6  | Megalothymia     | It is important for the respondent to show his/her abilities.            | Extremely so, Yes it’s important, It’s somewhat important, A little, Not important, Not at all important |
|    |                  |                                                                          | 1,2,3,4,5,6 (respectively)         |
| 7  | Religiosity      | Irrespective of whether you belong to a specific religion, how religious would you say you are on a scale from 0 to 10? | Scale from "Not at all religious" to Extremely religious |
|    |                  |                                                                          | Scale from 0 to 10                  |
| 8  | Tradition        | Tradition is important to the respondent                                | Extremely so, Yes it’s important, It’s somewhat important, A little, Not important, Not at all important |
|    |                  |                                                                          | 1,2,3,4,5,6 (respectively)         |
| 9  | Adherence to rules | Schools need to teach children to adhere to rules and to be disciplined. | Completely agree. Agree. Neither agree nor disagree. Disagree. Completely disagree. |
|    |                  |                                                                          | 1,2,3,4,5 (respectively)           |
|   | Acknowledgment of external values | The respondent believes people should do as they are told. | Very much so, Yes, Somewhat, A little, Not so, Not at all 1,2,3,4,5,6 (respectively) |
|---|---------------------------------|--------------------------------------------------------|------------------------------------------------------------------------------------------|
| 11 | Having a good time | It is important for the respondent to have a good time | Very much so, Yes, Somewhat, A little, Not so, Not at all 1,2,3,4,5,6 (respectively) |

**2.2. Life Attitudes**

|   | The role of migrants | The presence of migrants in our country enriches our culture | Agree, Probably agree, Probably Disagree, Disagree 1,2,3,4 (respectively) |
|---|----------------------|-----------------------------------------------------------|--------------------------------------------------------------------------------|
| 12 | Role of the state | The less the state intervenes in the economy, the better for the country | Completely agree. Agree. Neither agree nor disagree. Disagree. Completely disagree. 1,2,3,4,5 (respectively) |
| 13 | Cultural change | Overall, is the cultural life of Greece downgraded or enriched by people coming to live here from other countries? | Scale from "Cultural life is downgraded" to "Cultural life is enriched" |
|   |                      |                                                           | Scale from 0 to 10 |
| 14 | Altruism | It is important for the respondent to help people around her/him. | Extremely so, Yes it’s important, It’s somewhat important, A little, Not important, Not at all important 1,2,3,4,5,6 (respectively) |
| 15 | Environment | Firmly believes that it is important for people to take care of nature. | Extremely so, Yes it’s important, It’s somewhat important, A little, Not important, Not at all important 1,2,3,4,5,6 (respectively) |
| 16 | Trust | Generally speaking, would you say that we can trust most people or should we always be cautious? | Scale from "We should always be cautious" to "We can trust most people" |
|   |                      |                                                           | Scale from 0 to 10 |
| 17 | Become wealthy | It is important for the respondent to be wealthy. | Extremely so, Yes it’s important, It’s somewhat important, A little, Not important, Not at all important 1,2,3,4,5,6 (respectively) |
| 18 | Surprises | The respondent likes surprises and always wants to be doing new things | Extremely so, Yes, Moderately so, A little, Not so, Not at all 1,2,3,4,5,6 (respectively) |
| 19 | Makes decisions | It is important for the respondent to make their own decisions about what they do. | Extremely so, Yes it’s important, It’s somewhat important, A little, Not important, Not at all important 1,2,3,4,5,6 (respectively) |
| 20 | Successful | It is important for the respondent to be very successful | Extremely so, Yes it’s important, It’s somewhat important, A little, Not important, Not at all important 1,2,3,4,5,6 (respectively) |
| 21 | Seeks adventure | Seeks adventure and enjoys risk taking. | Extremely so, Yes, Moderately so, A little, Not so, Not at all 1,2,3,4,5,6 (respectively) |
| 22 | Political self-position | In politics it is customary for people to speak of "Left" and "Right". Where would you place yourself? | Scale from "Left" to "Right" |
|   |                      |                                                           | Scale from 0 to 10 |

**2.3. Demographics**

|   | Income status | In which of the following categories does the total monthly income after tax of your household belong? | <700 euro, 701-1000 euro, 1001-1250 euro, 1251-1500 euro, 1501-1750 euro, 1750 -2000 euro, 2001-2500 euro, 2501-3000 euro, 3001-4000 euro, 4001 and over |
|---|--------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
Table 2. Results of the Principal Components Analysis.

| Importance of components: | PC1  | PC2  | PC3  | PC4  | PC5  | PC6  | PC7  | PC8  | PC9  |
|---------------------------|------|------|------|------|------|------|------|------|------|
| Standard deviation        | 1.7747 | 1.6208 | 1.4796 | 1.34778 | 1.25679 | 1.10923 | 1.04414 | 1.03165 | 0.98236 |
| Proportion of Variance    | 0.1211 | 0.101 | 0.0842 | 0.06987 | 0.06075 | 0.04732 | 0.04193 | 0.04094 | 0.03712 |
| Cumulative Proportion     | 0.1211 | 0.2222 | 0.3064 | 0.37625 | 0.437 | 0.48432 | 0.52625 | 0.56719 | 0.6043 |
|                           | PC10 | PC11 | PC12 | PC13 | PC14 | PC15 | PC16 | PC17 | PC18 |
| Standard deviation        | 0.94871 | 0.9192 | 0.90091 | 0.8728 | 0.85502 | 0.83738 | 0.8245 | 0.81353 | 0.80055 |
| Proportion of Variance    | 0.03462 | 0.0325 | 0.03122 | 0.0293 | 0.02812 | 0.02697 | 0.02615 | 0.02546 | 0.02465 |
| Cumulative Proportion     | 0.63892 | 0.6714 | 0.70264 | 0.7319 | 0.76005 | 0.78702 | 0.81317 | 0.83862 | 0.86327 |
|                           | PC19 | PC20 | PC21 | PC22 | PC23 | PC24 | PC25 | PC26 |      |
| Standard deviation        | 0.77749 | 0.74613 | 0.7015 | 0.67692 | 0.67482 | 0.64621 | 0.61761 | 0.4347 |      |
| Proportion of Variance    | 0.02325 | 0.02141 | 0.01893 | 0.01762 | 0.01751 | 0.01606 | 0.01467 | 0.00727 |      |
| Cumulative Proportion     | 0.88652 | 0.90793 | 0.92686 | 0.94449 | 0.962 | 0.97806 | 0.99273 | 1 |      |

| State of Health | PC1 | PC2 | PC3 | PC4 | PC5 | PC6 | PC7 | PC8 | PC9 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Security        | -0.15331 | -0.275 | -0.05733 | 0.06504 | -0.19117 | -0.11066 | 0.166548 | 0.094709 | 0.187453 |
| Equitability    | -0.00454 | -0.25634 | -0.15942 | 0.209414 | -0.27823 | -0.19783 | 0.29712 | -0.23825 | -0.02196 |
| Megalothymia    | 0.160298 | -0.30006 | -0.04549 | 0.076684 | 0.249011 | 0.073747 | -0.11912 | 0.256086 | 0.140492 |
| Religiosity     | 0.318765 | 0.100486 | -0.1577 | 0.238865 | -0.00333 | -0.07849 | 0.142598 | -0.09089 | 0.076184 |
| Tradition       | -0.33531 | -0.28099 | -0.01804 | -0.02868 | -0.11109 | -0.04764 | 0.029147 | 0.170979 | 0.01905 |
| Acknowledgment  | -0.09049 | -0.30181 | -0.06344 | 0.11153 | -0.0352 | -0.05244 | -0.07438 | 0.176756 | -0.03419 |
| values                          | PC10  | PC11  | PC12  | PC13  | PC14  | PC15  | PC16  | PC17  | PC18  |
|--------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Adherence to rules             | -0.16356 | -0.13922 | -0.09542 | 0.006355 | 0.113879 | 0.583852 | 0.176591 | 0.074032 | 0.205189 |
| Having a good time             | 0.132324 | -0.33752 | -0.06637 | 0.076347 | 0.277984 | -0.15912 | -0.17216 | 0.032128 | 0.06849  |
| The role of migrants           | 0.279918 | 0.090111 | -0.14755 | 0.177155 | -0.29712 | 0.217453 | -0.19818 | 0.274513 | 0.217204 |
| Role of the state              | -0.00014 | -0.0648 | -0.02416 | 0.107801 | 0.149962 | 0.243102 | -0.27521 | 0.247706 | -0.78597 |
| Cultural change                | -0.31077 | -0.12338 | 0.045931 | -0.08034 | 0.349288 | -0.19979 | 0.188286 | -0.27629 | -0.10541 |
| Altruism                       | -0.12556 | -0.23581 | -0.13821 | 0.186777 | -0.23387 | 0.211796 | 0.046625 | -0.24804 | -0.17633 |
| Environment                    | -0.05949 | -0.28863 | -0.19116 | 0.215455 | -0.27484 | -0.15796 | 0.044415 | 0.049799 | -0.09011 |
| Trust                          | -0.06561 | 0.146373 | -0.09233 | 0.035908 | 0.041808 | -0.29678 | 0.284212 | 0.556249 | 0.037644 |
| Become wealthy                 | 0.150393 | -0.25932 | -0.04037 | 0.081417 | 0.454151 | 0.030721 | -0.20199 | 0.016553 | 0.274319 |
| Political self-position        | 0.211686 | 0.174781 | -0.16553 | 0.262076 | -0.08226 | -0.15063 | -0.17278 | -0.02677 | -0.07761 |
| Income status                  | -0.16554 | 0.02661 | 0.017339 | 0.01043 | -0.08819 | 0.109266 | -0.52346 | -0.28829 | 0.242648 |
| Age                            | 0.385535 | -0.12589 | -0.00905 | 0.011894 | 0.08694 | -0.15093 | 0.146344 | -0.17545 | -0.11446 |
| Level of education             | -0.21661 | 0.046653 | 0.124619 | -0.0397 | -0.04005 | -0.43868 | -0.47387 | 0.121262 | 0.03094  |
| Happiness                      | -0.21154 | 0.238934 | -0.27438 | 0.382117 | 0.245698 | 0.004651 | 0.043371 | -0.0791 | 0.033892 |
| Satisfaction                   | -0.20245 | 0.217884 | -0.24493 | 0.423126 | 0.246437 | -0.06156 | 0.051794 | -0.0918 | 0.007568 |
| Surprises                      | -0.00864 | 0.024469 | 0.433163 | 0.323717 | 0.004039 | -0.00936 | -0.02511 | -0.03721 | 0.065134 |
| Makes decisions                | -0.00286 | -0.00961 | 0.344659 | 0.195535 | 0.003919 | 0.01257 | 0.148481 | 0.131496 | 0.058002 |
| Successful                     | 0.025679 | -0.06014 | 0.386142 | 0.28918 | -0.00039 | 0.037897 | 0.047275 | 0.071186 | -0.02911 |
| Seeks adventure                | 0.005556 | -0.04368 | 0.448676 | 0.306431 | -0.04715 | 0.043338 | 0.055646 | -0.08294 | -0.01368 |
| PC10                           |       |       |       |       |       |       |       |       |       |
| PC11                           |       |       |       |       |       |       |       |       |       |
| PC12                           |       |       |       |       |       |       |       |       |       |
| PC13                           |       |       |       |       |       |       |       |       |       |
| PC14                           |       |       |       |       |       |       |       |       |       |
| PC15                           |       |       |       |       |       |       |       |       |       |
| PC16                           |       |       |       |       |       |       |       |       |       |
| PC17                           |       |       |       |       |       |       |       |       |       |
| PC18                           |       |       |       |       |       |       |       |       |       |
|                                | PC19     | PC20    | PC21    | PC22    | PC23    | PC24    | PC25    | PC26    |
|--------------------------------|----------|---------|---------|---------|---------|---------|---------|---------|
| State of Health               | -0.16684 | 0.23525 | 0.17165 | 0.39103 | -0.23703| -0.24768| 0.27737 | -0.0335 |
| Security                      | -0.00166 | 0.03013 | -0.03413| -0.12014| 0.08659 | -0.13299| 0.06375 | -0.00118|
| Equitability                  | 0.011324 | -0.26033| -0.02338| 0.087249| -0.13827| 0.033768| 0.02440 | 0.008362|
| Megalothymia                  | -0.36949 | -0.04006| 0.32031 | -0.05805| 0.119229| -0.11427| 0.018003| 0.006574|
|                                | Religiosity | Tradition | Acknowledgment of external values | Adherence to rules | Having a good time | The role of migrants | Role of the state | Cultural change | Altruism | Environment | Trust | Become wealthy | Political self-position | Income status | Age |
|--------------------------------|-------------|-----------|-----------------------------------|--------------------|-------------------|---------------------|-------------------|-----------------|----------|-------------|-------|---------------|-----------------------------|-------------|-----|
|                                | 0.212081    | -0.2455   | -0.00012                          | -0.14331           | 0.473704          | 0.164842            | 0.056879          | -0.02257        | 0.186461 | -0.05605    | 0.172832| 0.01174       | -0.5579                                   | 0.02871     | -0.11001|
|                                | 0.359837    | -0.16896  | -0.03937                          | 0.179583           | -0.37319          | -0.06076            | 0.031787          | 0.06519         | 0.412221 | 0.154331    | 0.131491| 0.267415      | -0.08138                                  | 0.001536    | -0.03906|
|                                | 0.42306     | 0.198855  | 0.013606                          | 0.183539           | 0.243035          | 0.005202            | -0.02007          | 0.10655         | 0.021909 | -0.31301    | -0.08765| -0.59112      | 0.011479                                  | 0.053067    | -0.0746 |
|                                | 0.108729    | 0.103208  | 0.013796                          | -0.06422           | 0.017685          | -0.08588            | -0.04207          | -0.20558        | 0.034626 | -0.10991    | 0.023578| 0.147653      | -0.03131                                  | -0.10832    | -0.49289|
|                                | -0.10666    | -0.39468  | 0.016573                          | 0.216984           | 0.074899          | 0.023864            | -0.04897          | 0.077436        | 0.053187 | -0.10991    | 0.005015| -0.20146      | -0.02279                                  | 0.02884     | -0.34394|
|                                | 0.294265    | 0.481192  | -0.01738                          | -0.09933           | -0.22489          | 0.401736            | 0.074019          | 0.355071        | -0.03035 | 0.092569    | -0.05499| 0.208573      | -0.07571                                  | 0.03488     | 0.258283|
|                                | -0.21329    | -0.30227  | 0.027505                          | -0.01478           | 0.006635          | 0.529067            | 0.01176           | 0.579552        | -0.07819 | 0.034256    | -0.05397| -0.08082      | 0.087185                                  | -0.01036    | -0.33479|
|                                | 0.00688     | -0.00048  | -0.0849                           | -0.01894           | -0.00883          | -0.00312            | 0.003456          | 0.018691        | 0.009015 | 0.009687    | 0.009687| 0.004662      | 0.01569                                  | -0.01168    | 0.086922|
| Level of education | -0.03225 | 0.422032 | 0.205361 | 0.046761 | 0.276687 | 0.040125 | -0.02498 | 0.045004 |
|-------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| Happiness         | -0.0208  | -0.077   | 0.033375 | 0.082116 | -0.0391  | -0.09722 | 0.005068 | 0.705455 |
| Satisfaction      | -0.01982 | -0.05821 | 0.002047 | 0.034587 | 0.057392 | -0.02922 | -0.03937 | -0.6976  |
| Surprises         | 0.008696 | 0.08732  | -0.02059 | -0.37649 | -0.46878 | -0.16488 | 0.055146 | 0.004477 |
| Makes decisions   | -0.19177 | 0.091646 | -0.00428 | 0.054544 | 0.108796 | -0.01239 | 0.053768 | 0.002469 |
| Successful        | 0.15348  | 0.029256 | 0.152574 | -0.18689 | -0.07208 | -0.06104 | -0.02093 | 0.000264 |
| Seeks adventure   | -0.00596 | -0.19843 | -0.10859 | 0.513492 | 0.413529 | 0.202675 | -0.03064 | 0.046563 |

Table 3. PC Regression Identity and Creativity 2019-2020 (130x26).
|     | Estimate | Std. Error | t value | Pr(>|t|) |
|-----|----------|------------|---------|---------|
| (Intercept) | -2.14636 | 0.217773 | -9.856  | < 2e-16 *** |
| State of Health | 0.166079 | 0.030993 | 5.359   | 9.92E-08 *** |
| Security | -0.00344 | 0.029548 | -0.116  | 0.907397 |
| Megalothymia | 0.174282 | 0.019915 | 8.751   | < 2e-16 *** |
| Religiosity | 0.046485 | 0.011178 | 4.158   | 3.42E-05 *** |
| Tradition | 0.072746 | 0.025277 | 2.878   | 0.004069 ** |
| Adherence to rules | 0.098001 | 0.033411 | 3.467   | 0.000543 *** |
| The role of migrants | 0.118668 | 0.011044 | 3.552   | 0.000396 *** |
| Cultural change | 0.028551 | 0.012926 | 2.209   | 0.027369 * |
| Become wealthy | 0.075825 | 0.018272 | 4.15    | 3.55E-05 *** |
| Political self-position | 0.096491 | 0.011844 | 8.46    | 6.45E-05 *** |

Table 4. Regression of variables with loadings (≥ 0.30) which belong to statistically significant PC.
Table 5. Regression 2019-2020 of statistical significant variables (1305x11).

| Coefficients: | Estimate | Std. Error | t value | Pr(>|t|) |
|---------------|----------|------------|---------|----------|
| (Intercept)   | -2.1684  | 0.19341    | -11.211 | <2E-16   *** |
| State of Health | 0.16773  | 0.03064    | 5.474   | 5.27E-08 *** |
| Megalothymia  | 0.17432  | 0.01983    | 8.792   | <2E-16   *** |
| Religiosity   | 0.04748  | 0.01084    | 4.379   | 1.29E-05 *** |
| Tradition     | 0.07187  | 0.02409    | 2.984   | 2.90E-03 ** |
| Adherence to rules | 0.09782  | 0.0281    | 3.481   | 5.16E-04 *** |
| The role of migrants | 0.12114  | 0.03315  | 3.655   | 2.68E-04 *** |
| Cultural change | 0.02831  | 0.01279  | 2.213   | 2.71E-02 * |
| Become wealthy | 0.07559  | 0.0182   | 4.154   | 3.49E-05 *** |
| Age           | 0.07414  | 0.01772    | 4.184   | 3.05E-05 *** |
| Happiness     | -0.05217 | 0.01248    | -4.181  | 3.10E-05 *** |

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1. Residual standard error: 0.8541 on 1287 degrees of freedom; Multiple R-squared: 0.28, Adjusted R-squared: 0.2705, F-statistic: 29.44 on 17 and 1287 DF, p-value: < 2.2E-16.

Notes: Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1. All variables have been eliminated which are not significant at 5%. Residual standard error: 0.8526 on 1294 degrees of freedom; Multiple R-squared: 0.2786, Adjusted R-squared: 0.2731; F-statistic: 49.98 on 10 and 1294 DF, p-value: < 2.2E-16.