



Creativity meets social capital: Theory and field evidence^{☆,☆☆}

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ABSTRACT

We model *creativity* as capital built by costly creative effort that complements social capital and is often accompanied by routines that economize attention and time. Higher effort costs are associated with lower entry into the creative state, while openness and trust are associated with higher productivity of creative effort mainly through creative capital. Using field survey data from an Italian music festival and a recursive bivariate probit, we find that costs are negatively associated with creativity, whereas creativity is strongly associated with festival collaboration, volunteering, and territorial cooperation. Consistent with a routinization perspective, the creativity–engagement link is stronger when participation occurs in more socially “structured” environments. To encourage creativity, policies should reduce cognitive frictions and improve the productivity of creative effort.

1. Introduction

Are routines the enemies or the allies of creativity? Some studies state that routines constrain novelty: by reinforcing repetition and stability, they may lock individuals and organizations into rigid patterns and limit their ability to generate new ideas (Ford & Gioia, 2000; Pierce & Delbecq, 1977). Others suggest the opposite view: routines can act as allies of creativity. By reducing uncertainty and economizing scarce attention and time, routines provide a stable framework that makes exploration and innovation more effective (Gilson et al., 2005; Norman & Bobrow, 1975; Ohly et al., 2006; Wickens et al., 2021). This discussion is relevant not only for individual problem-solving or organizational performance but also for society at large. Creativity may generate social spillovers: when creative effort is mobilized, it can foster cooperation, trust, and participation in collective projects. In other words, creativity not only produces new ideas but can also translate into social capital, the networks, norms, and prosocial behaviors that sustain collective action (Glaeser et al., 2002).

In this paper, we aim to investigate how individual creativity, conceived as a stock built through cognitively costly effort, is associated with cooperative and prosocial behaviors. Our framework emphasizes

the complementarity between creativity and social capital: higher effort costs make creative engagement less likely, while openness and trust are associated with higher productivity of creative effort by strengthening its interaction with networks and relationships. In this framework, creative effort, openness, and trust, and routines play distinct and complementary roles: creative effort is the input that generates creative capital; openness and trust act as multipliers of its productivity; and routines reduce the cognitive costs of coordinated action while raising the return to creative effort in producing social outcomes. From this perspective, routines and creativity are not substitutes but complements: routines stabilize action and free resources, while creativity expands what people and communities can achieve together. We test this framework using field survey data collected during the 2019 edition of “La Notte della Taranta”, one of the largest traditional music festivals in Europe. The survey measured self-perceived creativity alongside three forms of social engagement: collaboration during the festival, volunteering, and collaboration within the local territory. To capture underlying mechanisms, we construct synthetic indices of effort costs and openness–trust using Principal Components Analysis (PCA), and estimate a recursive bivariate probit model to account for the joint determination of creativity and social capital.

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Our analysis delivers three main findings. First, individuals who perceive themselves as creative are substantially more likely to collaborate, volunteer, and participate in local community engagement. Second, higher effort costs are significantly associated with a lower probability of being creative. Third, once creativity is accounted for, the direct association between openness, trust, and social engagement weakens, consistent with the interpretation that openness and trust are associated with higher productivity of creativity rather than directly shaping prosocial behavior. Finally, consistent with a routinization perspective, we find that the creativity-engagement association is stronger in socially “structured” environments (such as festivals and territorial collaborations) than in less structured ones (such as generic volunteering). We emphasize that the direction of the association runs from creativity to prosocial behavior, not the other way around: we do not claim that prosocial motives drive creative engagement, but rather that creative individuals are more likely to collaborate, volunteer, and engage territorially.

The paper speaks to two strands of literature: psychology, which emphasizes the motivational and social drivers of creativity, and economics, which conceptualizes creativity as a form of human capital with social spillovers.

In psychology, existing research highlights that intrinsic motivation, often reinforced by prosocial motives, sustains creative engagement (Amabile, 1996; Grant & Berry, 2011; Li & Bai, 2015). Individuals motivated by both personal interest and concern for others tend to generate more original ideas, especially when their decisions affect collective outcomes (Polman & Emich, 2011). Creativity also thrives in socially embedded contexts: openness, trust, and social interaction nurture idea generation (Chen et al., 2021; Chua et al., 2012; Glaeser et al., 2000), while risk aversion can restrain participation in creative endeavors (Harada, 2021; Toh & Miller, 2016; Tyagi et al., 2017). Cultural participation plays a similar role, as events that foster cross-cultural exchange and shared traditions provide fertile ground for creative expression (Attanasi et al., 2023; Towse & Navarrete Hernández, 2020).

In economics, creativity is increasingly studied as a form of human capital shaped by context and incentives (Binder & Witt, 2011; Boyd et al., 2011; Charness & Grieco, 2019; Pugno, 2024). Its development depends on education, resources, and institutions: higher schooling fosters openness and risk tolerance (Biasi et al., 2021; Davies et al., 2013; Flor et al., 2013), while economic security facilitates creative engagement and scarcity constraints it (Baumol (1967), Maslow (1943) and Wolff et al. (2014). Beyond intrinsic drivers, extrinsic incentives also matter, from monetary rewards to social recognition (Attanasi et al., 2021). Yet classic growth models largely overlooked creativity as an individual-level investment, focusing instead on ideas and innovation (Aghion & Howitt, 1990; Romer, 1990). Later contributions reframed creativity as a distinct asset complementary to physical and human capital (Florida, 2019; Lucas, 2009), while recent work emphasizes that creative effort is costly, uncertain, and preference-dependent (Menger, 2014; Pugno, 2024).

Building on these insights, our contribution is threefold. First, from a theoretical perspective, we develop what, to our knowledge, is the first model that integrates the psychology of creativity as costly creative effort with the economics of creativity as capital accumulation. This framework formalizes how effort costs and social traits jointly shape the complementarity between routines, creativity, and cooperative outcomes. We note that this framework does not attempt to capture all dimensions of human creativity. Rather, it focuses specifically on creativity as an input in the production of socially valuable outcomes — the dimension most relevant to our research question about the relationship between creative engagement and prosocial behavior. Second, we employ a non-standard measure of creativity: instead of relying on externally evaluated tasks (Addis et al., 2026; Torrance, 1974), we use individuals’ self-perceived creativity. This approach aligns with recent evidence that subjective assessments are meaningful predictors

of behavior and identity (Karwowski et al., 2013). In our setting, self-assessment provides a direct proxy of how individuals perceive and mobilize their own creative identity in socially embedded contexts, allowing us to document associations between creative self-perception and actual social engagement. Third, we document these associations in a non-standard but socially “structured” environment: a large-scale musical and cultural festival. This field setting combines heterogeneity with social embeddedness, enabling us to observe how creativity is associated with cooperation in real-world interactions. By combining a subjective measure of creativity with a naturalistic setting, we capture both the cognitive costs of creative effort and its association with prosocial outcomes more directly than in traditional laboratory studies.

The paper is structured as follows. Section 2 introduces the framework and its testable implications. Section 3 describes the field setting, measurement strategy, and empirical approach. Section 4 reports the empirical findings and interprets them through the lens of the framework. Section 5 concludes.

2. A simple model of creativity

We conceive creativity not as a special ability, but as a standard input in the production of socially valuable outcomes, generated through creative effort that entails a quadratic cost (e.g., fatigue, opportunity cost). The representative agent chooses the optimal effort to allocate to creative activities in order to maximize utility net of costs. More precisely, we assume that individuals accumulate creative capital through creative effort.

Both the productivity of effort and the disutility associated with producing creative capital are individual-specific, i.e., they depend on personal and social traits. The effects of creative effort on creative capital depend on factors such as openness to new ideas, willingness to be exposed to diverse stimuli, openness to non-traditional perspectives, and trust in unfamiliar social interactions. These factors act as multipliers of the productivity of creative effort in generating creative output. This assumption is consistent with a broad literature showing that cognitive diversity and access to heterogeneous sources of information foster idea generation and knowledge recombination (Burt, 2004; Page, 2008), while openness to experience is systematically associated with creative performance (McCrae, 1987). We capture these influences through the individual-specific productivity parameter $\alpha(i)$.

Conversely, greater risk aversion may reduce the willingness to engage in experimentation and novel activities, thereby lowering the expected return to creative effort.

We consider a simple economy where, at time t , consumer i derives utility from current consumption C_t and bears a cost to allocating resources to creative capital. Socially valuable output Y_t is produced with social capital S_t and creative capital A_t via a Cobb–Douglas technology:

$$Y_t = [\alpha(i)A_t]^\beta S_t^{1-\beta}, \quad \beta \in (0, 1), \quad \alpha(i) > 0, \quad (1)$$

where β is the output elasticity with respect to A_t and $1 - \beta$ that with respect to S_t . The productivity parameter $\alpha(i)$ is individual-specific, and captures differences in the effectiveness with which creative capital contributes to socially valuable outcomes. It summarizes characteristics such as openness to new ideas, exposure to diverse sources of information, and the ability to recombine knowledge. Accordingly, $\alpha(i)$ should be interpreted broadly as capturing all factors that make a given unit of creative effort more productive, including domain-specific skills, experience, and other individual characteristics that enhance the effectiveness of creativity. Importantly, $\alpha(i)$ affects production rather than accumulation: it does not directly influence the evolution of creative capital, but instead scales its contribution to output and, through this channel, the effectiveness of social capital.

The interaction between social capital (S_t) and creative capital (A_t) arises in production. The Cobb–Douglas specification implies that both inputs enter jointly and are complementary in the generation of output.

Therefore, there is no direct transmission from A_t to S_t in the model. Instead, creative capital affects economic outcomes only through its joint productivity with social capital in production.

In each period, the consumer chooses investment in *social* and *creative* capital. Capital stocks evolve according to the following laws-of-motions:

$$S_t = (1 - \delta_S)S_{t-1} + s_t, \quad (2)$$

$$A_t = (1 - \delta_A)A_{t-1} + a_t, \quad (3)$$

where s_t denotes investment in social capital (e.g., time and resources devoted to networks, participation, and collaboration), a_t is the creative effort devoted to creativity, and $\delta_S, \delta_A \in (0, 1)$ are obsolescence rates.

We interpret S as social capital that includes repeated collaborative practices and procedures – roles, informal codes, networks, and shared “know-how”. Routinization operates on two margins: (i) *costs* – well-functioning routines reduce the cognitive load of coordinated action, effectively lowering the cost of creative engagement; (ii) *productivity* – common protocols and shared expectations raise the return to creative effort in producing social outcomes. We therefore model routines and creativity as complements: richer routines reduce coordination frictions and increase the effectiveness with which creative capital (A) translates into socially valuable outcomes (S).

Resources are allocated to consumption and social capital investment:

$$Y_t = C_t + s_t. \quad (4)$$

Creative effort is costly and negatively affects utility. We assume a logarithmic utility function for consumption – a standard special case of CRRA preferences – to capture diminishing marginal utility while preserving analytical tractability. Therefore, instantaneous utility reads:

$$U_t(C_t, a_t) = \ln C_t - \frac{\gamma(i)}{2} a_t^2, \quad \gamma(i) > 0. \quad (5)$$

The agent chooses $\{a_t, s_t\} \in [0, 1]^2$ to maximize discounted utility subject to (2)–(4) and (5):

$$\max_{\{a_t, s_t\} \in [0, 1]^2} \sum_{t=0}^{\infty} \delta^t \left\{ \ln(Y_t - s_t) - \frac{\gamma(i)}{2} a_t^2 \right\}, \quad \delta \in (0, 1). \quad (6)$$

Let the value function be:

$$V(A_t, S_t) = \max_{\{a_t, s_t\}} \left\{ \ln(Y_t - s_t) - \frac{\gamma(i)}{2} a_t^2 + \delta V(A_{t+1}, S_{t+1}) \right\}.$$

To characterize the optimal allocation, we restrict attention to an interior solution, as is standard in this class of dynamic optimization problems. Therefore, the first-order and envelope conditions are:

$$\gamma(i) a_t = \delta V_A(A_{t+1}, S_{t+1}), \quad (7)$$

$$\frac{1}{C_t} = \delta V_S(A_{t+1}, S_{t+1}), \quad (8)$$

$$V_A(A_t, S_t) = \frac{\beta Y_t}{A_t C_t} + \delta(1 - \delta_A) V_A(A_{t+1}, S_{t+1}), \quad (9)$$

$$V_S(A_t, S_t) = \frac{(1 - \beta) Y_t}{S_t C_t} + \delta(1 - \delta_S) V_S(A_{t+1}, S_{t+1}). \quad (10)$$

Combining (7)–(10) yields the Euler equations:

$$\gamma(i) a_t = \delta \frac{\beta Y_{t+1}}{A_{t+1} C_{t+1}} + \delta(1 - \delta_A) \gamma(i) a_{t+1}, \quad (11)$$

$$\frac{1}{C_t} = \delta \left[\frac{(1 - \beta) Y_{t+1}}{S_{t+1} C_{t+1}} + \frac{1 - \delta_S}{C_{t+1}} \right]. \quad (12)$$

At a steady state $(A^*, S^*, a^*, s^*, C^*, Y^*)$:

$$a^* = \delta_A A^*, \quad (13)$$

$$s^* = \delta_S S^*, \quad (14)$$

$$Y^* = [\alpha(i) A^*]^\beta (S^*)^{1-\beta} \Rightarrow \frac{A^*}{S^*} = \frac{1}{\alpha(i)} \left(\frac{Y^*}{S^*} \right)^{1/\beta}, \quad (15)$$

$$C^* = Y^* - \delta_S S^* \Rightarrow \frac{C^*}{S^*} = \frac{Y^*}{S^*} - \delta_S. \quad (16)$$

Feasibility ($C^* > 0$) requires $Y^*/S^* > \delta_S$.

From (12) at the steady state,

$$\frac{1}{\delta} = (1 - \beta) \frac{Y^*}{S^*} + (1 - \delta_S) \Rightarrow \frac{Y^*}{S^*} = \frac{1 - \delta(1 - \delta_S)}{\delta(1 - \beta)} \equiv y_S.$$

Using (15)–(16):

$$\frac{A^*}{S^*} = \frac{1}{\alpha(i)} \left(\frac{1 - \delta(1 - \delta_S)}{\delta(1 - \beta)} \right)^{1/\beta}, \quad (17)$$

$$\frac{Y^*/S^*}{C^*/S^*} = \frac{1 - \delta(1 - \delta_S)}{1 - \delta(1 - \delta_S) - \delta \delta_S(1 - \beta)}. \quad (18)$$

Moreover, from (11) and (13),

$$\gamma(i) \delta_A [1 - \delta(1 - \delta_A)] (A^*)^2 = \delta \beta \frac{Y^*}{C^*}, \quad (19)$$

which implies

$$A^* = \sqrt{\frac{\delta \beta}{\gamma(i) \delta_A} \cdot \frac{1}{1 - \delta(1 - \delta_A)} \cdot \frac{y_S}{y_S - \delta_S}}. \quad (20)$$

It follows that

$$S^* = \alpha(i) y_S^{1/\beta} \sqrt{\frac{\delta \beta}{\gamma(i) \delta_A} \cdot \frac{1}{1 - \delta(1 - \delta_A)} \cdot \frac{y_S}{y_S - \delta_S}}, \quad (21)$$

and hence

$$C^* = (y_S - \delta_S) S^*, \quad (22)$$

$$Y^* = y_S S^*. \quad (23)$$

Two individual-specific parameters govern steady-state behavior. The *cost* parameter $\gamma(i)$ directly lowers optimal creative effort and the accumulation of A , thereby reducing Y and C . By contrast, the *productivity* parameter $\alpha(i)$ does not directly affect the accumulation of A ; it operates through the production technology by raising the marginal productivity of social capital in conjunction with creativity. In this sense, $\alpha(i)$ amplifies the complementarity between creative and social capital: higher productivity of creativity makes social capital more effective, sustaining higher steady-state output and consumption.

This distinction is central to our empirical analysis. The parameters $\alpha(i)$ and $\gamma(i)$ provide a reduced-form representation of two conceptually distinct channels through which individual characteristics may affect creativity. Some traits primarily influence the productivity of creative effort, captured by $\alpha(i)$, while others mainly affect the cognitive or opportunity costs associated with engaging in creative activities, captured by $\gamma(i)$. These parameters should be interpreted as reduced-form objects that may reflect both individual characteristics and the broader social environment in which creative activities take place. The empirical analysis investigates whether the observed correlates of creativity are more closely associated with one channel or the other, and how these channels shape the relationship between creativity, social capital, and socially valuable outcomes.

3. Data and methodology

3.1. Survey design and data collection

We conducted a field survey through guided interviews during “La Notte della Taranta” festival, one of the largest European events celebrating popular culture and traditional music. The festival takes place annually in August in Salento (southern Apulia, Italy) and attracts around 450,000 participants each year (see Attanasi et al., 2013; Attanasi, Peruzzi et al., 2026). The choice of this setting is motivated by its large scale, the heterogeneity of its attendees, and the fact that the same research design has already been successfully applied in previous studies addressing both the festival’s economic and sociological impact and other relevant research questions (see, e.g., Attanasi et al.,

2013; Attanasi, Ciccarone et al., 2025; Attanasi, Peruzzi et al., 2026; Michailidou & Rotondi, 2019; Vergine et al., 2024).

Our survey was administered during the 2019 edition of the festival, which spans several weeks and culminates in the Final Concert at the end of August. Data were collected in five different stages of the event: three itinerant concerts (held in Soletto, Sternatia, and Martano) and the rehearsal of the Final Concert (together defined as Minor Concerts), and the Final Concert itself.¹ During Minor Concerts, 6–8 graduate students randomly selected respondents in concert squares and nearby streets over a 3–4 h window (8:30 p.m.–12:30 a.m.). For the Final Concert, the number of interviewers was scaled up to about 30–35 to cover the much larger crowd, with interviews conducted in two shifts (before the concert from 6:30 p.m. to 9:30 p.m., and during and after the concert from 9:30 p.m. to 3:30 a.m.).² In both events, male and female respondents were independently and randomly selected; no more than one person per group could be interviewed, and each individual participated only once. Each interview lasted about seven minutes.

The procedure generated a convenience sample, in the sense that interviews were consistently conducted in comparable conditions (same team, same timing, same sampling strategy) and refusal rates were minimal, given the short duration of the questionnaire relative to the length of the concerts.³ The resulting sample ensures wide heterogeneity in age, education, and occupation. Its geographic distribution is broadly comparable to the Italian population at the regional level – with the expected exception of Apulia, the hosting region, which is clearly overrepresented – as documented in Attanasi, Peruzzi et al. (2026) using the Marbach test across multiple editions of the same survey.

The administered survey included questions about participants’ socio-demographic information, as well as items designed to assess participants’ self-perceived creativity, social capital, and their determinants. In Table A.1, we report the full set of survey questions used to construct the variables employed in the analysis, while Table 1 provides the corresponding summary statistics. As shown in the table, the sample is balanced by gender (47% male) and covers all age groups, with a concentration below 40 years (73% of respondents). Education levels are fairly heterogeneous, with almost half holding a secondary school degree and a smaller share reporting postgraduate studies (4.5%). Regarding occupation, about 31% are employees, 29% students, and 19% self-employed, with smaller proportions unemployed or retired.⁴

¹ Minor Concerts typically attract 5000–50,000 attendees, mainly locals, whereas the Final Concert draws a much larger and more diverse audience.

² The number of interviewers was proportionally distributed across nights, according to expected attendance, to ensure coverage of the population’s heterogeneity.

³ A few features of the survey design mitigate potential concerns about demand effects. First, the creativity and social capital items were embedded within a broader instrument covering multiple research agendas – including tourist motivations and local economic impact (Attanasi, Peruzzi et al., 2026) – making it unlikely that participants could identify the focal hypothesis and respond strategically to confirm it De Quidt et al. (2018). Second, if responses were primarily driven by experimenter demand or generalized prosocial compliance, one would expect relatively homogeneous positive responses across survey items. Instead, response rates vary substantially across items (e.g., only 36.5% express willingness to volunteer, compared to 60.1% for festival collaboration), inconsistent with a uniform context-driven bias. Third, the structured heterogeneity observed in the empirical results, across individual characteristics and forms of engagement, is more consistent with genuine behavioral mechanisms than with generic survey artifacts or social desirability effects.

⁴ Differences in sample sizes across variables reflect item-level nonresponse: all respondents were presented with all questions, but some chose not to answer specific items. There are no structured skip patterns in the questionnaire. The lower number of observations for Political ideology reflects the greater sensitivity of political self-placement questions, which typically exhibit higher

Table 1
Summary statistics of main variables.

Variable name	Obs.	Mean	Std. Dev.	Min	Max
Creativity	827	0.689	0.463	0	1
Festival collaboration	868	0.601	0.490	0	1
Volunteering	942	0.365	0.482	0	1
Territorial collaboration	876	0.475	0.500	0	1
Political ideology	601	5.373	2.650	1	10
Self-trust	947	4.165	0.959	1	5
Risk aversion	948	0.461	0.499	0	1
Age <25	956	0.328	0.470	0	1
Age 26–30	956	0.233	0.423	0	1
Age 31–40	956	0.176	0.381	0	1
Age 41–60	956	0.164	0.371	0	1
Age >60	956	0.098	0.298	0	1
Primary school	948	0.173	0.378	0	1
Secondary school	948	0.489	0.500	0	1
High school	948	0.292	0.455	0	1
Postgraduate	948	0.045	0.208	0	1
Male	944	0.471	0.499	0	1
Employee	928	0.307	0.462	0	1
Unemployed	928	0.063	0.242	0	1
Self-employed	928	0.188	0.391	0	1
Retired	928	0.082	0.274	0	1
Student	928	0.295	0.456	0	1
Other	928	0.066	0.248	0	1

Notes: The table reports summary statistics for the main variables employed in the empirical analysis. Definitions and details on all variables are provided in Section 3.2 and Table A.1.

3.2. Measurement

Social capital (*S*). Social capital is a multifaceted construct that captures networks, trust, and norms that facilitate cooperation and collective action (Putnam et al., 1994). In empirical research, it is often measured through proxies of participation, volunteering, or civic engagement (Glaeser et al., 2002). Following this tradition, we operationalize *S* through three survey items that capture individuals’ willingness to engage in socially valuable behaviors: (i) collaboration in the organization of future editions of the festival (*Festival collaboration*) (Question Q2); (ii) volunteering in cultural or social associations (*Volunteering*) (Question Q3); and (iii) collaboration in other initiatives for the valorization of the local territory (*Territorial collaboration*) (Question Q4). These measures reflect different forms of cooperative engagement, i.e., episodic, associative, and territorial, that are central to the notion of social capital as the ability to mobilize for collective goals.

Creativity (*A*). Creativity is widely conceptualized as the ability to generate novel and useful ideas (Amabile, 1996). While creativity can be measured through performance tasks or expert evaluations (Charness & Grieco, 2019), in this study, we rely on a direct self-assessment question in which respondents indicate whether they perceive themselves as creative (Question Q1). We expect that individuals’ self-assessment is positively correlated with their actual creative potential and engagement, thereby providing a meaningful proxy for creativity in our field setting (Attanasi et al., 2019).

Cost index (*Cost*). In the theoretical model, $\gamma(i)$ captures the marginal disutility of creative effort. Since we do not directly observe individual fatigue or opportunity costs in the survey, we proxy effective cognitive

nonresponse rates. We have no strong reasons to believe that missingness is systematically related to the key variables in the analysis.

costs with a PCA-based index built from three standardized components: (i) *Inattention*, measured as the difference between the reported dislike of having less money than others and the dislike of having more money than others (Questions Q8 and Q9)⁵; (ii) *Willingness to pay* a small fee for attending/supporting the event (Question Q10); and (iii) *Overall life satisfaction*, computed as the standardized average of satisfaction with life, work, health, and family (Question Q11). Higher inattention, lower willingness to pay, and lower satisfaction are interpreted as signals of higher costs of allocating cognitive resources to creative activities. We perform a PCA on these variables and retain the first component, which explains about 37% of the total variance. The loadings are negative for inattention and positive for willingness to pay and satisfaction. For interpretability, we reverse the sign of the components so that higher values of the index correspond to higher cognitive costs. The loadings and explained variance are reported in Table A.2.

Alpha index (Alpha_i). In the theoretical model, $\alpha(i)$ measures the productivity of creative capital, i.e., how effective creative effort is in generating creative output. As for the cost index, we approximate this dimension with an openness-trust index constructed via PCA on two standardized items: (i) *Generalized trust* in others (Question Q12); and (ii) *Tolerance*, measured as the perception that one's city is tolerant (Question Q13). We perform a PCA on these variables and retain the first component, which explains 52.5% of the total variance. Factor loadings are positive and almost identical across the two variables (0.71 for both trust and tolerance), suggesting that they move closely together and capture a common underlying dimension of openness. We interpret higher values of the index as higher productivity of creativity, since more trusting and tolerant individuals are expected to derive more output from the same level of creative effort. The loadings and explained variance are reported in Table A.3.

Control variables. In addition to the main constructs, we collected a set of individual characteristics that may shape attitudes and behaviors relevant to creativity and social capital. The first group comprises standard socio-demographic variables: age, recorded in five categories (Question B), gender (Question A), education level (Question C), and employment status (Question D). These variables provide essential background information on the heterogeneity of respondents and allow us to control for observable socio-demographic differences across individuals. The second group comprises attitudinal variables that are theoretically linked to the propensity to self-identify as creative: *Political ideology*, measured through a self-placement on a left–right scale (Question Q5); *Self-trust*, capturing confidence in one's own abilities and judgment (Question Q6)⁶; and *Risk aversion*, elicited through a

small-stakes lottery choice (Question Q7).⁷ For example, political orientation may correlate with openness to non-conformist views, self-trust captures confidence in one's ability to generate ideas, and risk attitudes influence willingness to engage in uncertain creative endeavors. These attitudinal variables enter only the creativity equation, as their influence on social capital outcomes is expected to operate primarily through creativity rather than directly.

3.3. Econometric specification

We observe, for each individual i , two binary indicators:

$A_i \in \{0, 1\}$ (“creative”),

$S_i \in \{0, 1\}$ (“social capital”).

By construction, $A_i = \mathbf{1}\{A_i^* > 0\}$ and $S_i = \mathbf{1}\{S_i^* > 0\}$, where A_i^* and S_i^* are latent indices summarizing the net benefits of reaching the corresponding thresholds.

The theoretical model implies that creativity depends primarily on the costs of creative effort (a proxy for $\gamma(i)$), while social capital depends on costs and on productivity shifters (a proxy for $\alpha(i)$), and may be complementary to creativity.

Consistently, we posit the recursive bivariate probit:

$$A_i^* = \theta_0 + \theta_1 \text{Cost}_i + \theta_2' Z_i + \theta_3' X_i + u_i, \quad (24)$$

$$S_i^* = \phi_0 + \phi_1 A_i + \phi_2 \text{Cost}_i + \phi_3 \text{Alpha}_i + \phi_4' X_i + v_i, \quad (25)$$

with (u_i, v_i) jointly normal,

$$\begin{bmatrix} u_i \\ v_i \end{bmatrix} \sim \mathcal{N}\left(\begin{bmatrix} 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 1 & \rho \\ \rho & 1 \end{bmatrix}\right),$$

so that variances are normalized to one (on the probit scale) and $\rho = \text{corr}(u_i, v_i)$ captures unobserved dependence across equations. Here: Cost_i is an index of effort costs (proxy for $\gamma(i)$); Alpha_i is an index of productivity shifters (proxy for $\alpha(i)$); Z_i represents the set of attitudinal control variables included in the creativity equation only, as described in Section 3.2; X_i denotes the vector of socio-demographic controls included in both equations. The parameter ϕ_1 captures the association between creativity and social capital, consistent with the complementarity predicted by the model.

The creativity equation includes, in addition to Cost_i and socio-demographic controls, the attitudinal variables Z_i – political ideology, self-trust, and risk aversion – described in Section 3.2. These variables are theoretically linked to creative self-perception and enter only the creativity equation. Their exclusion from the social capital equation reflects the theoretical prediction that their influence on cooperative outcomes operates primarily through creativity rather than directly. Routinization is not measured directly at the individual level. Rather, it enters the empirical framework through the variation in social structure across the three outcome contexts. Festival collaboration and territorial collaboration take place within more structured and recurring organizational frameworks – with established roles, shared expectations, and repeated interactions – while volunteering in cultural or social associations is a more generic and less structured form of engagement. Our framework predicts that the creativity–engagement association should be stronger in more routinized environments, because richer

⁵ We acknowledge that this measure may partly reflect asymmetric social comparisons in the spirit of Bolton and Ockenfels (2000) and Fehr and Schmidt (1999), where high values correspond to individuals who weight disadvantageous inequality more heavily than advantageous inequality. Under either interpretation, individuals who are more focused on relative disadvantage are less likely to allocate attention and effort to uncertain creative activities, which is consistent with the role of this component in the Cost index.

⁶ It is important to note that *Self-trust* refers to confidence in one's own abilities and decision-making capacity — conceptually closer to self-confidence (Bénabou & Tirole, 2002) and distinct from interpersonal trust. It should therefore not be confused with the propensity to trust others, which is instead measured by Question Q12 and enters the Alpha index.

⁷ Question Q7 measures risk aversion through revealed preferences in a small-stakes lottery. Specifically, individuals who agree to pay € 0.50 for a 1/100 chance of winning the accumulated fund are interpreted as relatively less risk-averse, whereas those who decline are interpreted as more risk-averse. This approach follows a well-established tradition in experimental economics that elicits risk attitudes through incentivized lottery choices (Holt & Laury, 2002). The monetary lottery used here adapts a widely employed survey-based measure of risk preferences to the specific context of the festival environment (Guiso & Paiella, 2008).

Table 2
Recursive bivariate probit — Key coefficients (Creativity, Cost, Alpha).

Dep. var.	Festival collaboration		Volunteering		Territorial collaboration	
	A	S	A	S	A	S
Creativity (A_i)	–	1.349*** (0.379)	–	1.934*** (0.105)	–	1.791*** (0.098)
Cost index ($Cost_i$)	–0.215*** (0.066)	–0.199** (0.098)	–0.199*** (0.058)	–0.009 (0.052)	–0.174*** (0.062)	–0.110** (0.055)
Alpha index ($Alpha_i$)	–	0.039 (0.057)	–	0.030 (0.046)	–	–0.028 (0.048)
Observations	406	406	433	433	387	387
$\hat{\rho}$		–0.929* (0.524)		–4.806 (4.188)		–5.616 (8.911)

Notes: The table reports coefficients from recursive bivariate probit models. Robust standard errors in parentheses. Dashes indicate not applicable (e.g., A does not enter the creativity equation; $Alpha_i$ is excluded from that equation by design). Definitions and details on all variables are provided in Section 3.2 and Table A.1.

* $p < 0.10$.

** $p < 0.05$.

*** $p < 0.01$.

routines provide greater leverage for the transmission from creativity to cooperative behavior. This prediction is tested by comparing the pattern of associations across the three outcomes. We estimate (24)–(25) as a recursive bivariate probit. The log-likelihood is the sum of bivariate normal cumulative density functions evaluated at (A_i, S_i) -specific thresholds. The bivariate probit is justified on statistical grounds by the presence of a non-zero cross-equation correlation $\hat{\rho}$, which indicates common unobservable factors jointly affecting both outcomes. Estimating the two equations separately via standard probit would ignore this dependence and produce inefficient estimates.

Guided by theory: $\theta_1 < 0$ (higher costs are associated with a lower probability of being creative); $\phi_2 < 0$ (higher costs are associated with lower social capital); $\phi_3 > 0$ (higher productivity shifters are associated with higher social capital); $\phi_1 > 0$ (complementarity). The sign of ρ is empirical; $\rho \neq 0$ signals unobserved factors jointly affecting both margins.

4. Empirical outcomes

Table 2 reports the key coefficients from the recursive bivariate probit for the three social capital outcomes described in Section 3: *Festival collaboration*, *Volunteering*, and *Territorial collaboration*. For each outcome, the table displays two columns: the creativity equation (A) and the corresponding social capital equation (S), which includes creativity A as a regressor. By construction, $Alpha_i$ enters only the S -equation, whereas A does not appear on the right-hand side of the A -equation.

Three regularities emerge. First, creativity and social capital are strongly associated. In every specification, the coefficient on A in the S -equation is large and precisely estimated – ranging from about 1.35 to 1.93 ($p < 0.01$) – indicating that self-perceived creativity is associated with a markedly higher probability of collaborating at the festival, volunteering, and engaging in territorial cooperation. This pattern is consistent with the model's mechanism whereby creative engagement relates to richer social connections and cooperative behaviors.

Second, the cost index is negatively associated with the probability of being creative. In the A -equation, coefficients lie around -0.17 to -0.22 and are statistically significant in all outcomes, consistent with the theoretical prediction. In the S -equations, $Cost_i$ is also negative for *Festival collaboration* and *Territorial collaboration* (and significant in those cases), whereas it is small and imprecise for *Volunteering*. This pattern suggests that the primary role of costs is to be associated with lower entry into the creative state, with a direct association with social

capital behaviors that is context-dependent and, on average, weaker than the indirect channel mediated by A .

Third, the productivity shifter does not display a robust direct association with S once creativity is controlled for. This is consistent with the notion that $Alpha_i$ is associated with higher productivity of creative effort rather than social capital per se, so that its influence operates largely through creativity and is consequently absorbed by A when both appear in the S -equation.⁸

Finally, the estimated cross-equation correlation ρ is negative and different from zero in at least one specification, pointing to common unobservable variables that jointly are associated with lower creativity and social capital and further justifying joint estimation. All coefficients are on the probit scale; interpretation should therefore focus on direction and statistical precision rather than raw magnitudes.

Taken together, these estimates are consistent with the mechanisms posited by the model. The data are consistent with a two-step transmission: (i) higher cognitive costs are associated with lower entry into the creative state; (ii) individuals who self-identify as creative display strongly higher socially valuable behaviors. In other words, costs are associated with a lower supply of creativity, while creativity itself is positively associated with a higher demand for social capital.

The three outcomes also hint at meaningful heterogeneity. The direct cost channel is detectable for *Festival collaboration* and *Territorial collaboration* but not for *Volunteering*. A plausible interpretation is that episodic, locally coordinated actions (festival/territorial collaboration) are more sensitive to frictions in attention, time, and small monetary hurdles than sustained, identity-driven volunteering; by contrast, volunteering seems to be associated primarily with the creative margin itself, captured by A . This pattern is consistent with the idea that creativity and social capital are not interchangeable: creativity is a proximate correlate of mobilization, while costs and openness shape how easily individuals reach and leverage the creative state. Consistent with a routinization perspective – whereby richer social structures reduce frictions and amplify the transmission from creativity to cooperative behavior – the association between A and S appears stronger in more structured contexts (festival and territorial collaboration) than in less structured ones (generic volunteering). This

⁸ The full set of controls is included in the underlying estimations but omitted from Table 2 for brevity. Complete results are reported in Table A.4.

heterogeneous pattern across outcomes provides indirect empirical support for the routinization hypothesis, even in the absence of a direct individual-level measure of routinization. We note, however, that alternative explanations cannot be ruled out: structured contexts may also amplify the creativity-engagement association through greater visibility of creative individuals, higher identity salience, a stronger sense of perceived impact, or a more defined time horizon for commitment.

The evidence that costs are associated with lower entry into the creative state and that self-perceived creativity is strongly associated with higher cooperation is consistent with the view that routines and creativity are allies: routines attenuate frictions, and creativity is associated with higher social behavior. The weak direct association of the productivity index with S , conditional on creativity, aligns with a mechanism where openness and trust – often themselves routinized into practices – work primarily by being associated with higher productivity of creative effort rather than moving cooperation on their own.

These findings should be interpreted as correlational evidence consistent with the theoretical framework. Both $Cost_i$ and $Alpha_i$ are PCA-based composites; any residual measurement error would attenuate their estimated effects, biasing against finding significance. The recursive bivariate probit is justified on statistical grounds by the non-zero cross-equation correlation $\hat{\rho}$, which signals common unobservable factors jointly affecting both margins and makes single-equation estimates potentially inefficient. Our joint approach, therefore, appears appropriate; still, the magnitudes should be interpreted on the probit scale and with awareness of remaining latent heterogeneity.

External validity is naturally bounded by the festival context. A large, itinerant cultural event intensifies social mixing, lowers psychological barriers, and may temporarily increase both perceived openness and opportunities for joint action. If anything, this context likely raises the association between creativity and the $Alpha$ channel, making the complementarity between creativity and cooperation more visible. At the same time, the rich heterogeneity of the audience enhances informational content, making the setting a credible naturalistic field setting for studying behavioral drivers of creativity.⁹

Policy implications follow directly from the associations documented above. Two levers stand out. First, interventions that reduce cognitive costs – such as simplified access and timing, small participation grants, salient planning aids, or light-touch nudges that economize attention – may lift the extensive margin of creativity and, through it, raise cooperation. Second, initiatives that raise the *productivity* of creative effort – like trust-building, inclusive and tolerant environments, cross-group encounters – may make a given unit of creative effort more socially effective. Because the estimates are consistent with strong complementarities, combining the two levers is likely to yield super-additive gains.

5. Conclusion

This paper addresses a young, rapidly growing, and inherently interdisciplinary line of research that views creativity as an individual investment with social spillovers. Our contribution is twofold. Theoretically, we propose a simple framework in which creativity accumulates through costly creative effort into a stock of creative capital that complements social resources. The model delivers sharp predictions about two margins of heterogeneity: (i) *costs* of effort, which are associated

with a lower supply of creativity; and (ii) *productivity shifters* (openness, trust), which are associated with higher effectiveness of creative effort and, through complementarity, with higher aggregate social outcomes. Empirically, exploiting a naturalistic field setting, we document that higher costs are associated with a materially lower probability of being creative, while creativity is strongly and positively associated with multiple forms of social capital. Once creativity is held fixed, productivity shifters exhibit weak direct associations with social outcomes, consistent with a transmission mechanism operating primarily through creativity.

Our findings also suggest that balancing routines and creativity is socially productive: improving routine scaffolds that lower cognitive costs and strengthening environments that are associated with a higher payoff to creative effort may yield high social returns. Policies that combine operational simplifications (better routines) with trust- and tolerance-building (higher productivity of creative effort) are therefore likely to be super-additive.

Taken together, the evidence is consistent with a two-step pattern: cost frictions are associated with lower entry into the creative state; once active, creativity is associated with higher cooperative behaviors and collaborative engagement. This mapping helps organize disparate findings in the literature and clarifies why interventions that either reduce cognitive frictions or are associated with higher productivity of creative effort may yield outsized social returns, especially when the two levers are combined.

We are cautious about scope and interpretation. Our indices of costs and productivity are composite proxies and likely subject to measurement error; the festival context, while information-rich, bounds external validity; the recursive structure of the model relies on theoretical assumptions about which variables enter each equation, and the results should be interpreted as correlational evidence consistent with the framework rather than as causal estimates. For these reasons, we refrain from strong claims on magnitudes and emphasize qualitative patterns that are robust across outcomes and specifications.

Much remains to be done. Promising directions include: (i) longitudinal designs to test the persistence of the association between creative engagement and durable routines and networks; (ii) field interventions that manipulate costs (timing, attention aids, micro-incentives) as well as the scaffolds that may raise the productivity of creative effort (trust-building, cross-group exposure); (iii) direct measurement of individual-level routinization – for example, through items capturing habitual participation, role clarity, or familiarity with collaborative procedures – to allow a more precise test of the routinization mechanism; and (iv) linking survey evidence with administrative or digital traces to bridge attitudes, behaviors, and realized outcomes. Our aim is to offer a coherent theoretical-empirical lens on the transmission channels of creativity. We hope this framework and evidence will guide a research agenda that transitions from identifying associations to designing interventions. This will advance a new and expanding field of clear substantive interest.

CRedit authorship contribution statement

Giuseppe Ciccarone: Writing – review & editing, Writing – original draft, Software, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Giovanni Di Bartolomeo:** Writing – review & editing, Writing – original draft, Validation, Supervision, Software, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Valentina Peruzzi:** Writing – review & editing, Writing – original draft, Software, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Maria Luigia Signore:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.

Appendix. Additional figures and tables

⁹ We acknowledge that the on-site festival setting introduces contextual factors that may influence responses. The festive atmosphere and elevated mood associated with cultural events may temporarily inflate willingness to engage in prosocial activities; social desirability pressures may lead respondents to present themselves as more creative or cooperative than they typically are; and the short interview dynamics limit the depth of elicitation. These features of the setting are one of the reasons why the paper consistently emphasizes associations and patterns consistent with the theoretical framework rather than strong causal claims.

Table A.1
Questionnaire items.

No.	Question and response scale
A	Gender: 0 = Female; 1 = Male
B	Age: 1 = <25; 2 = 26–30; 3 = 31–39; 4 = 40–60; 5 = >60
C	Education: 1 = Primary; 2 = Middle school; 3 = High school; 4 = Bachelor; 5 = Postgraduate
D	Profession: 1 = Employee; 2 = Unemployed; 3 = Self-employed; 4 = Retired/disabled; 5 = Student; 6 = Other
Q1	Would you define yourself as a creative person? (0 = No; 1 = Yes)
Q2	Would you be willing to help organize future editions of the festival? (0 = No; 1 = Yes)
Q3	Would you be willing to participate as a volunteer in cultural, environmental, or social associations? (0 = No; 1 = Yes)
Q4	Would you be willing to collaborate in other initiatives aimed at enhancing the local territory? (0 = No; 1 = Yes)
Q5	When people talk about politics, they usually use the terms “left” and “right.” On a scale from 1 (extremely left) to 10 (extremely right), where would you place yourself?
Q6	How much do you trust yourself? (1 = Not at all; 5 = Absolutely)
Q7	Would you agree to pay a ticket of €0.50 to create a fund that, at the end of the evening, is assigned to a person randomly drawn among 100 participants? (0 = No; 1 = Yes)
Q8	How much do you dislike having less money than others? (0 = Not at all; 10 = Very much)
Q9	How much do you dislike having more money than others? (0 = Not at all; 10 = Very much)
Q10	Would you agree to pay a small fee to participate in the festival? (0 = No; 1 = Yes)
Q11	How satisfied are you with the following aspects of your life? (0 = Completely dissatisfied; 10 = Completely satisfied): 1. Your life; 2. Your work; 3. Your health; 4. Your family
Q12	Generally speaking, how much do you trust other people? (0 = Not at all; 10 = Completely)
Q13	Do you think you live in a “tolerant” city? (0 = No; 1 = Yes)

Table A.2
Cost components loadings.

Variable	Loading on 1st component
Inattention	−0.46
Willingness to pay	0.71
Satisfaction	0.53
Explained variance (%)	36.6

Notes: PCA conducted on standardized variables (inattention, willingness to pay, and satisfaction). The first principal component is retained as the index of cognitive costs. The sign was reversed so that higher values correspond to higher cognitive costs.

Table A.3
Alpha components loadings.

Variable	Loading on 1st component
Generalized trust	0.71
Tolerance	0.71
Explained variance (%)	52.5

Notes: PCA conducted on standardized variables (trust, tolerance). The first principal component is retained as the index of productivity shifters (α_i). Higher values correspond to greater trust and openness, i.e. higher productivity of creativity.

Table A.4
Recursive bivariate probit estimates.

Measures of K:	Festival collaboration		Volunteering		Territorial collaboration	
Dep. Variable:	A	K	A	K	A	K
	(1)	(2)	(3)	(4)	(5)	(6)
Creativity		1.349*** (0.379)		1.934*** (0.105)		1.791*** (0.098)
Cost index ($Cost_i$)	−0.215*** (0.066)	−0.199** (0.098)	−0.199*** (0.058)	−0.009 (0.052)	−0.174*** (0.062)	−0.110** (0.055)
Alpha index ($Alpha_i$)		0.039 (0.057)		0.030 (0.046)		−0.028 (0.048)
Age 26–30	−0.259 (0.224)	−0.054 (0.207)	−0.408* (0.211)	−0.098 (0.181)	−0.215 (0.216)	−0.059 (0.189)
Age 31–39	−0.425* (0.246)	0.088 (0.236)	−0.411* (0.236)	0.057 (0.202)	−0.350 (0.245)	0.305 (0.218)
Age 40–60	−0.478* (0.269)	−0.059 (0.268)	−0.470* (0.244)	0.103 (0.209)	−0.266 (0.255)	0.080 (0.229)
Age > 60	−0.252 (0.372)	−0.010 (0.332)	−0.360 (0.314)	0.263 (0.264)	0.066 (0.360)	−0.271 (0.328)
Secondary school	−0.307 (0.246)	0.083 (0.240)	−0.252 (0.231)	−0.001 (0.214)	−0.213 (0.256)	−0.052 (0.223)
High school	−0.222 (0.275)	−0.160 (0.275)	−0.170 (0.265)	−0.118 (0.239)	−0.069 (0.287)	−0.221 (0.258)
Postgraduate	−0.218 (0.389)	0.288 (0.371)	−0.033 (0.399)	−0.082 (0.352)	−0.361 (0.416)	0.193 (0.380)
Male	−0.029 (0.140)	−0.137 (0.132)	0.013 (0.136)	−0.182 (0.121)	0.002 (0.143)	−0.040 (0.127)
Unemployed	0.287 (0.314)	0.182 (0.303)	0.251 (0.283)	−0.004 (0.233)	0.351 (0.289)	−0.048 (0.246)
Self-employed	0.264 (0.185)	−0.034 (0.179)	0.234 (0.184)	−0.030 (0.166)	0.265 (0.196)	−0.244 (0.173)
Retired	−0.590 (0.393)	0.623* (0.336)	−0.441 (0.304)	0.061 (0.260)	−0.710* (0.374)	0.540 (0.329)
Student	0.154 (0.220)	0.039 (0.201)	0.076 (0.220)	−0.157 (0.188)	0.192 (0.217)	−0.022 (0.191)
Other	0.093 (0.305)	−0.435* (0.260)	0.066 (0.286)	−0.036 (0.223)	0.020 (0.284)	−0.402* (0.240)
Political ideology	−0.037* (0.022)		−0.073*** (0.019)		−0.040** (0.019)	
Self-trust	0.041 (0.073)		0.109* (0.056)		0.070 (0.054)	
Risk aversion	−0.103 (0.124)		−0.024 (0.107)		−0.140 (0.110)	
Observations	406	406	433	433	387	387
$\hat{\rho}$		−0.929* (0.524)		−4.806 (4.188)		−5.616 (8.911)

Notes: Standard errors in parentheses. Models estimated via recursive bivariate probit. A denotes creativity; K denotes the measure of social capital indicated in the column heading. $Cost_i$ is the PCA-based index of effort costs; $Alpha_i$ is the PCA-based index of productivity shifters. $\hat{\rho}$ is the correlation parameter across equations.

* $p < 0.10$.

** $p < 0.05$.

*** $p < 0.01$.

Data availability

The data that has been used is confidential.

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