CREATIVITY NARRATIVES AMONG COLLEGE STUDENTS: Sociability and Everyday Creativity

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Despite foundations in early pragmatism, research on social patterning of creative action has been scarce in the multidisciplinary literature on creativity. We address this by exploring how students perceive their creative contributions to college life. By analyzing narratives, we find that the majority of creativity is associated with everyday experiences and social interactions, in contrast to a popular and scholarly focus on extraordinary individual achievement in domains like art and science. We also find strong trends in sociability as students negotiate both "where they stand" with regards to those around them as well as "how they stand out" as individuals.

INTRODUCTION

"Creativity" has become a buzzword across popular social science and humanities disciplines as scholars and journalists seek to understand the nature of contemporary cities, labor markets, educational institutions, and organizational cultures. The value of creativity and innovation emerges from distinctive social contexts, acquiring different meanings across groups, institutions, time, and political geography. Therefore, greater attention to the social patterning of creativity may provide insight into how creative processes unfold and how they are recognized and rewarded in daily life.

To this end, we investigate how college students perceive their own creative contributions to campus life. We analyze "creativity narratives"—short, autobiographical descriptions of where and how students feel most creative. By coding and analyzing these narratives, we highlight types of creativity operating on campus. Among these we find six "latent" types—*Networking*, *Nurturing*, *Idealistic*, *Renaissance*, *Social Media*, and *Gregarious* creativities. We describe these types as latent because they emerge from patterns of responses among students rather than emerging from a priori definitions of creativity. Conventional definitions of creativity might lead to the mistaken expectation

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that students view the arts and sciences as primary outlets for their innovations and expressivity. Our results instead suggest that individual students find creative outlets in ways that have largely been below the radar of scholars and policymakers.

Like recent research on college student life and work on "little c" or "everyday" creativity, we find students identify various crafts, social activities with peers, and relatively mundane daily activities as important loci for creativity. Routine aspects of social life—like hanging out with friends, working in a student organization, and volunteering—were frequently nominated as key sites for creativity. This research amplifies a recent finding in the higher education literature that college is important as a site where individuals, at a formative time in their lives, learn how to navigate daily routines, social relationships, markets, and institutions in ways that allow for personal expression, novelty, improvisation, and sometimes resistance (Kuh 1993, 1995; Pascarella and Terenzini 2005; Nathan 2006; Clydesdale 2007). This suggests that scholars might productively refocus attention from the intellectual rewards of the classroom toward the creative management of students' extracurricular lives. After all, both facets of college deeply structure students' everyday lives and experiences.

Creativity Research in the Social Sciences

While the study of creativity has deep roots in early sociological thinking, the empirical study of creative phenomena is remarkably multidisciplinary. It is beyond our task to comprehensively address each branch of this research stream, and we focus more narrowly on a sociological perspective that creativity is socially patterned. However, it is also necessary to briefly describe how this perspective might be considered a radical departure from the pantheon of research on creativity.

A constructive starting point for us is to define creativity as the production of what we consider to be both novel (i.e., original, innovative) and appropriate (i.e., useful) (James, Clark, and Cropanzano 1999:211). In this sense, creativity is both distinctive from what exists as well as socially accepted and valued, and so remains in keeping with some conventions of form and function. Creativity often emerges in groups and collaborative circles, where there are strong pressures to conform to group norms. This conformity can be seen in efforts to establish trust as well as in attempts to develop common goals and agreed upon ways of working together. At the same time, individuals within such creative groups often compete with one another, seek to develop their own creative identity within the group, and push boundaries. Often the group as a whole is defined by the extent to which it deviates from accepted conventions (Farrell 2001).

This notion that creativity can be usefully located at the intersection of the individual and group is a feature of pragmatist scholarship that takes lived experience, individuality, group sensibilities, and social interaction as fundamental projects in social change. For instance, William James ([1899] 1971) identified the need for individuals to take into account the experiences of others when making inferences about the world and social life. Adopting the mantle of "radical empiricist," James makes the claim that ". . . *the relations that connect experiences must themselves be experienced relations, and*

any kind of relation experienced must be accounted as 'real' as anything else in the system" ([1904] 2000:315, italics in original). He argued that creativity had an eminently experiential and relational character to it by virtue of the connections between actions of individuals as well as the relationships within an individual's own experiences: "If there *be* real creative activities in being, radical empiricism must say, somewhere they must be immediately lived" (James [1905] 1971:216, italics in original).

John Dewey (1930) similarly placed a high value on individual lived experience but emphasized the interactive, and thereby social, necessity of creativity:

> We are given to associating creative mind with persons regarded as rare and unique, like geniuses. But every individual is in his own way unique. Each one experiences life from a different angle than anybody else, and consequently has something distinctive to give others if he can turn his experiences into ideas and pass them on to others. (P. 3)

Dewey argues that the significance of experience is judged in the relationship between an individual and the environment—the social embedding of this experience, or knowledge. Dewey would translate these sentiments into educational policy, arguing that ". . . there is an intimate and necessary relation between the processes of actual experience and education" ([1938] 1979:20). This combination of individualized, experiential knowledge joined to structured pedagogy was important to his theory of progressive educational reform. Striking in Dewey's claim is his skepticism of "genius"—a theme that carries forward in his work on art and aesthetics. In his influential treatise "Art as Experience" (1934), Dewey explicates the notion that artistic expression—one mode of creative action—is an attempt to recapture the complexity of lived experience.[1]

From this tradition we are reminded of the myriad ways in which creativity can emerge in social interaction. Yet systematic examination of the social patterning of creativity was never a central concern for pragmatists like Dewey or James. Moreover, while these thinkers usefully situated creativity as part of the development of the individual in a social context, creativity was also not the primary focus of their theoretical vision.

With the notable exceptions of the work of Harrison White (1993) and Hans Joas (1996), there has been remarkably little sociological theory that treats creativity as a complex and robust social process enmeshed in our everyday lives. White seeks to explore modes of creativity in the arts and how narrative, identity, and artistic production and consumption influence one another in artistic practice. Similarly, Joas views creativity as a core component of the human condition, although he seeks a more unified theoretical vision. To this end, he takes pains to articulate a historically contingent duality between habitual ("pre-reflective") action and contextually embedded creative action.

While Joas's vision has spurred a lively theoretical discussion (for critical book reviews, see Camic 1998; McGowan 1998; Gross 1999), some argue that Joas emphasizes agent-less cycles of extraordinary or nonhabitual creativity at the expense of creative actions undertaken to develop and maintain conventional behavior. As Dalton (2004) puts it:

Creativity is not simply a reaction to the interruption of previously successful routines but can be and often is the result of conscious attempts at improving habitual action—making routine more successful than it has been in the past, even that routine generally is successful. (P. 610)

Indeed, other streams of creativity research have demonstrated that specialized training and practice—for example, adhering to and mastering conventions—are prerequisites for creative breakthroughs in any domain (Bloom 1985; Gardner 1988; Amabile 1996).[2]

It is also the case that communities sanction the expressions of creative individuality that are *too distinctive* within a social environment. The many cases of artistic censorship or moral outrage, like that against the Brooklyn Museum of Art's 1999 "Sensation" show, illustrate limits to what a given public considers acceptable creativity.[3] Within artistic fields, when artists break with conventions—as in the work of Charles Ives or John Cage—they are often met with resistance and sanctions from other artists as well as from audiences (Becker 1982). Likewise, scientists are often shunned at important points in their careers because they do not adhere to the conventions of their discipline (Keller 1983; Pinch 1993; Gieryn 1999). Thus, the attention of both early and more contemporary pragmatists has not been directly connected to the social science literature on creativity and conventions, nor has it inspired much empirical investigation. Our research seeks to fill this lacuna.

We also seek to address a tension between the study of exceptional, eminent or "big C" creativity and that of everyday or "little c" creativity (Beghetto and Kaufman 2007). Scholars studying eminent creativity typically attempt to isolate the biological and behavioral traits that contribute to the extraordinary achievement of individuals (Gardner 1993; Simonton 1997; Csikszentmihalyi 1999; for a review, see Runco 2004), while those studying everyday creativity investigate problem-solving skills. These skills are deployed across many ordinary realms of activity including cooking, child care, and fixing one's home (Runco 1999). Ruth Richards (2007) describes everyday creativity as

. . . [b]eing about everyone, throughout lives; it is fundamental to our survival. It is how we find a lost child, get enough to eat, and make our way in a new place and culture. It is not so much what we do as how we do it, whether this is at work or at leisure. With our everyday creativity, we adapt flexibly, we improvise, and we try different options, whether we are raising our child, counseling a friend, fixing our home, or planning a fundraising event. (P. 26)

With this definition of everyday creativity, scholars can capture the process of navigating decisions, dilemmas, resource procurement, and relationships in commonly occurring situations. The ubiquity of everyday forms of creativity makes them important phenomena for study. Although forms of everyday "little c" creativity are ubiquitous, they are often ignored by sociologists (Willis 2005). Paul Willis argues that our focus on canonized, institutionalized, commodified, or consecrated "big C" creativity has caused us to inadvertently overemphasize how creators, gatekeepers (like critics and curators), and organizations shape creativity and culture. We do so while

underexamining the creativity that individuals bring to their engagement with art and media, rendering such creativity "invisible." While some recent work has emphasized everyday creativity, more often than not scholars have looked at practices that are still socially recognized as appropriate domains for creativity—arts, media, entrepreneurship, marketing, and software development. Willis's expanded list is a good start—including such diverse activities as room decoration and rituals of romance.

Our study of college students expands this list well beyond cultural consumption to include a variety of other arenas of social life—from volunteering to religion, to athletics, to working for social justice. Our respondents also mention more traditional domains of creativity and personal expression such as art, dance, creative writing, science, and other forms of cultural consumption. These activities coexist alongside the more prevalent "social" forms identified in our analysis: networking, gregarious sociability, social interaction, and group leadership.

WHY STUDY CREATIVITY ON A COLLEGE CAMPUS?

Given the views of the early pragmatist school as well as more contemporary research on creativity, we contend that human action and agency can be usefully understood by systematic attention to the contexts of everyday experience and social interaction. In this sense, few environments are as naturally bounded as the college experience. It has long been recognized that higher education is a fertile context for the development of creativity (Stewart 1946; Yamamoto 1975; Bok 2006). Recently, scholars and university leaders have explicitly identified and promoted the benefits of a "creative campus"—where creativity and the arts are seen as important ways to engage students and prepare them for a growing creative economy (Cole 1999; Florida et al. 2006), encourage citizenship (National Endowment for the Arts [NEA] 2006), strengthen communities (Goldbard 2008), and produce future patrons and stewards of the arts (Arthurs and Gibson 2004; Dempster 2004). Identifying and cultivating creative campuses is central to the health and vitality of the civic and cultural life of our communities and to the educational mission of our universities. Scholars have found that engagement in and outside the classroom is a key predictor of learning, graduation rates, satisfaction with, and overall success in college (Tinto 1987; Kuh 2003). If students feel more engaged by those activities that tap their creative capacities (see Csikszentmihalyi 1996, for ideas of "flow"), then understanding where "creativity" lives on campus will provide insight into ways universities and colleges can more effectively *engage* their students.

It is clear that creativity, in its many forms, is important to campuses and communities, yet we still have little understanding of the range of ways in which colleges nurture or impede its development (Tepper 2007). Moreover, very little research explicitly focuses on how students make sense of their experiences and the meanings that they construct around different social, educational, and cultural activities (e.g., Moffatt 1989). And just as a collaborative research agenda has emerged to share what scholars *do* know, this agenda confronts the dynamic reality of an ever-evolving creative campus

(Cantor and Lavine 2006; Zryd 2006). For example, there are new conceptions of creativity, both in industry and the arts, that now incorporate buzzwords like "synergistic thinking," interdisciplinary practice, hobbies and crafts, and new forms of thought and language.[4]

Taken together, this lineage of multidisciplinary concern with creativity—from insights of pragmatist philosophers to present-day sociology and scholarship on higher education—challenges us to imagine how we might systematically examine engagement with creativity on a college campus. Studies of creativity reveal tensions between conformity and individuation in social interaction, between conventions and novelty, and between the purely expressive and the practical. It is worth remembering that social interaction helps us to make meaning—forge common understandings, test our own assumptions against the world, take account of our roles—yet also serves as a site for developing our creative selves. Through social interaction, we not only know *where we stand* but also *how we stand out*.[5]

Our research seeks to identify different modalities of creative experience on campus. In so doing, we broaden our understanding of creativity by emphasizing (1) everyday forms of creativity and (2) the dynamic tensions and constraints facing students as they pursue their own creative pathways in college.

DATA AND MEASUREMENT

The need for systematic examination of the social patterning of creativity provoked us to ask a group of college students "*How do you pursue or express creativity?*" in order to better understand the nature of everyday creativity and the social form of distinction and individuation that it reflects. In the spring of 2006, surveys were collected from a sample of 128 students in five classes at an elite research university in the southeastern United States. The instrument measured individuals' understandings of creativity, demographic indicators (class cohort, gender, race), and attributes germane to the academic culture (major/minor concentration, organizational affiliations, creative spaces on campus). This could be considered a convenience sample insofar as a small number of faculty known to investigators were given the survey for distribution to students. However, the students asked to complete the survey were not selected out of any systematic process that intentionally sought desired characteristics. Table 1 reports on the sample distribution.

We note briefly that this sample captures adequate distributions of class cohorts and oversamples women and African Americans relative to the university's distribution, although neither was the consequence of a systematic sampling strategy.

To briefly describe our analysis procedure, we first inductively code the content of students' "creativity narratives." Then, with the goal of describing relationships in this data structure, we subject this content to a two-stage correlation analysis consisting of exploratory factor analysis (EFA) followed by multidimensional scaling (MDS). We describe each step in detail.

TABLE 1. Sample Description

Race	N	Percent	Discipline	N	Percent
White	81	63.3	Social sciences	56	43.8
African American	25	19.5	Biophysics	50	39.1
Asian American	10	7.8	Humanities	10	7.8
Biracial	6	4.7	Engineering	5	3.9
Hispanic	2	1.6	Interdisciplinary	3	2.3
No answer	4	3.1	No answer	4	3.1
Gender	N	Percent	Housing	N	Percent
Female	84	65.6	Misc. residence halls	55	42.9
Male	44	34.4	Quad A[a]	28	21.9
			Quad B[a]	13	10.2
			Quad C[a]	6	4.7
			Off-campus/NA	26	20.3
Class Cohort	N	Percent	Self-perception	N	Percent
Sophomore	50	39.1	Somewhat creative	88	68.8
Junior	35	27.3	Creative	39	30.5
First year	23	18.0	Not creative	1	0.8
Senior	20	15.6			

[a]Generic descriptors used for institutional anonymity.
N = 128 students.

Content Analysis of Creativity Narratives

The analysis of both content and structure of narrative has long been recognized by social scientists as a powerful tool with which to understand how individuals organize their experiences with the world (White 1993; Somers 1994; Franzosi 1998; Smith 2007). While the narratives elicited from students (N = 128) ranged from well-considered complete paragraphs to sparse sentence fragments describing creative dimensions, all are amenable to content analysis, thereby facilitating systematic comparison.[6] Following a grounded theoretical approach (Charmaz 2001), a codebook was inductively developed by researchers on the basis of respondents' narratives.[7] Phrases were assigned nominal codes that grew to a list of 40 discrete signifiers, shorthand for the dimensions of creativity an individual described.[8] As the codebook developed and more nominal categories were added, previous narratives were revisited and recoded. In this way, we achieved a preliminary measure of consistency in data reduction. This procedure additionally gives the benefit of giving voice to respondents in a way that minimizes a priori researcher classification bias.

EFA and MDS of Creative Dimensions

In addition to analyzing the content of creativity narratives at the individual level, we also examine similarities between individuals' narrative content at the group level. EFA is first used across students' narratives to analyze the inductively coded dimensions of creativity. This procedure groups together creative dimensions that share a degree of

commonality based upon individuals' patterns of nomination. EFA is a useful tool because it can aid in identifying latent factors that explain covariances among measured variables; these factors might then usefully suggest "types" of creativity without researchers imposing such structure on the data. The EFA procedure helps us to simplify the complex data structure into a more interpretable form and yields six variables that we feel describe underlying patterns of creativity in the data.

We also note that a significant number (N = 19) of the 40 creative dimensions do not load highly in the optimal factor solution; a low-loading creative dimension indicates that it has little in common with the other dimensions captured by the six factors. Because we do not wish to simply discard this important evidence, we next use MDS to visually describe associations between the remaining 19 creative items that failed to load highly in the factor analysis. Our use of the scaling analysis is therefore intended to augment the factor analysis with finer-grained detail.[9]

In sum, both ways of examining students' narratives—within an individual's narrative using content analysis and between individuals at the group level using EFA and MDS—can help us to better grasp how students understand creativity in their everyday lives.

RESULTS

Colleges often advertise themselves as creative domains—social and intellectual environments in which young adults can exercise vast freedom in exploring their emerging identities.[10] Students learn and socialize in groups in which trust, norms, and group goals are forged through collaboration and adaptation. However, the distinctive properties of each group member are also a focus for pride and service to the group. With this in mind, we should—and do—find evidence pertaining to conformity, individuality, and social interactivity in students' narratives. Yet we also see a number of other themes emerge, including a surprising number of "small c," everyday forms of creativity. Witness the response of this student to our survey question:

> In artistic performance I view the study of kung fu/tai chi to be creative and expressive, albeit only after learning the conventions of the domain of martial arts. I figure my conversation and behavior to be creative in that I am expressive, open, and have an off-(color) sense of humor while being laid back. I try to host unique events when I can. I like to try new things that are attempts at different ways of socializing or experiencing things as a group. In written expression, I choose to break with the line break convention of poetry when I can. I write poems and try to focus on new outlooks that invoke feeling as opposed to narrative blips. (R97)

This student mentions a range of types of activities: from martial arts to general conversation and behavior, to event planning and poetry. The multidomain experiences of creativity found here and throughout the responses sparked our interest. Finally, the student writing this response articulates the dynamic tension between assimilation and distinction, noting that kung fu/tai chi are creative outlets "only after learning the

TABLE 2. Frequency of Self-Reported Creative Dimensions

Creative Dimensions	N	Creative Dimensions	N
Writing	42	Appearance/fashion	5
Academic work	39	Athletics	5
Conversation	31	Crafts	5
Science	25	Computer	4
Music	24	Not creative	4
Visual art	23	Arts appreciation	3
Group activities	18	Humor	3
Dance	16	Volunteering	3
Everyday creativity	15	Social change	2
Performance	15	Cooking	2
Thinking	15	Culture	2
Behavior	13	Media	2
Design	12	Business	1
Interaction	11	Children	1
Problem solving	10	Competition	1
Event/party planning	8	Having fun	1
Individuality/uniqueness	8	Religion	1
Theatre	8	Time management	1
Friends	7	Travel	1
Networking	6	Varying activities	1

N = 128 students.

conventions" of the discipline. This deeply sociological insight governs the responses of most respondents both explicitly acknowledged and implicit in patterns across responses (Table 2).

Across all respondents, we note the wide range of creative dimensions students find meaningful; these include both behaviors as well as activities and might be classified in several ways. While we do see a number of what we might consider eminent, "big C" forms of creativity in the arts and sciences,[11] there are also quite a few forms of everyday, "little c" creativity.[12] Also striking were the many forms of *socially emergent* creativity, that is, forms of self-expression that either must be experienced with others or that are most meaningful when an audience is present.[13] We note that the activity of *writing*, discussed by 42 students, is the most prevalent creative dimension. The prominence of literacy as a creative outlet is somewhat surprising, especially given a recent report by the NEA (2007), which found that Americans as a population are reading less.[14] Noting these trends, we returned to the raw data to recode specifically for a "sociable" propensity and for forms of "literacy." With these more stringent criteria in mind, we find that 41 percent (N = 52) of students' creativity narratives show evidence of sociability, while 32 percent (N = 41) of students creatively express themselves through writing, including journals and poetry.

TABLE 3. Exploratory Factor Analysis, Six-Factor Solution

Factor 1: "Networking"		Factor 2: "Renaissance"	
Event planning	.77	Travel	.88
Group activities	.71	Not creative	.58
Networking	.67	Arts appreciation	.57
Interaction	.44	Athletics	.45
Factor 3: "Nurturing"		Factor 4: "Idealistic"	
Children	.78	Social change	.88
Crafts	.57	Religion	.76
Volunteering[a]	.55	Thinking	.41
Friends	.53		
Factor 5: "Social Media"		Factor 6: "Gregarious"	
Media	.63	Conversation	.61
Volunteering[a]	.57	Humor	.52
Computer	.42	Behavior	.33
Writing	.37		

[a]Indicates cross-loading variable.

We turn next to the results of the EFA, which obtained its best-modeled fit at six dimensions. We describe these creative types as *Networking*, *Renaissance*, *Nurturing*, *Idealistic*, *Social Media*, and *Gregarious* owing to the particular items that load highly on each factor. This solution has the additional benefit of having at least three items load on each factor, contributing to a more robust description, as well as very little cross-loading of items (there is only one case where an item, "volunteering," loads highly on both *Nurturing* and *Social Media* types). Table 3 reports on the factor structure.

The first of the six factors we discover is *Networking* creativity, which captures intensely social forms of creativity that involve other people. These include event planning, active networking, group activities with friends, and facets of general interaction. Some mention simply "*I host events*" (R18), especially "*unique events*" (R97), including "*coming up with ideas for themed parties*" (R81). One respondent (R114) links creativity to "*being a leader in the organizations that I am a part of and organizing events such as fundraisers.*" Others routinely express creativity in "*interactions with people on a daily basis*" (R114) or this rather detailed account: "*I think when interacting with others there are many creative and innovative manners by which one can conduct herself, and I feel this is a skill. I possess the ability to connect people on unique levels they might not have themselves determined. I see this as innovative, mainly in a less tangible sense*" (R95). There is occasionally a competitive dimension to this creative sociability, as in R48's comment: "*In everyday life, I use creativity to give me an academic or social edge over others.*" We are tempted to draw connections between the common mention of forms of networking and sociability and the density of student organizations on campus. To casual observation, it appears that a great deal of student life circulates around membership in, and initiation of, student activity groups. At present, there are several hundred groups serving between 5,000 and 8,000 undergraduates and which address social justice and

service, club athletics, academics, and hobbies. That these organizations are tagged as sites for creativity is thus an unsurprising result given the ratio of organizations to students, the variety of foci of these groups, and the ease with which such groups can be created. However, it was not expected that the social features of student organization membership would be included in narratives concerning creative expression.

The second creative type is designated the *Renaissance* type because its factor loadings reflect a rather traditional notion of the "renaissance man": interest in travel, arts appreciation, and participation in athletics. Here is a narrative that captures many of these features:

> *I'm sort of a formal jock (very athletic) so I'm not into the typical expressions of creativity (writing poems, art, etc.). Throughout my time here at [University], I've tried to tap into my typical creative side by involving myself in creatively challenging projects like participating in a dance company and [Student Organization] workshops. I've also ventured to travel to Italy and study abroad in Australia with the hopes of developing appreciation for art in different cultures.*

R34 mentions the experience of traveling abroad, art appreciation, and artistic activity (in the performing arts) and emphasizes the importance of participation in sports. We note that R34 distinguishes his creativity, even his participation in a dance company and dance workshops, from "typical expressions of creativity." Perhaps R34 intends to distinguish visual and literary art from performing arts, or perhaps this expression reflects the desire for distinctiveness—in this case, from typical creativity. Interestingly, a second respondent also clustered "athletics" (in this case, "*volleyball, cheer, gymnastics, baton-twirling*") separately from "dance" ("*hip-hop*") (R144). The curiosity here is that scholars have argued that hip-hop dance has not been incorporated into the arts in the United States, while the two students intentionally distinguish it from both athletic and artistic activities.[15]

The third creative type identified in the analysis was *Nurturing* creativity, which includes items dealing with interaction with children, volunteer experiences, crafts, and social time with friends. For example, R1 reports that she is creative in "*conversations with friends*" and "*thinking of ways to make them laugh*" with "*quick comebacks.*" The valence of this comment thus draws closer to forms of creative problem solving than to the kinds of networking and socialization that we saw in the sample response from the *Networking* type. R1 interacts with children by volunteering at the university hospital, "*doing projects with children, including drawing and making crafts.*" Although students report many kinds of volunteer activity, and often interaction with children occurs through babysitting work or family activities, R1 happens to combine the two in her volunteer activities at the campus hospital. Although both the title of this creative type and the activities it captures are traditionally the domain of women, there is no strong correlation of this type with gender in our sample.

Idealistic creativity, the fourth factor type, includes response items that mention intellectual creativity, engagement in social justice issues, and religion. These are individuals whose creativity is often strongly connected to their beliefs and ideals. For example, consider these two responses to our open-ended question:

Thinking of new ways to make a difference for the less fortunate of our society. (R33)

I express my creativity by using my skills and talents to praise the Lord. I am a devout Christian. I involve myself in Christian activities that can involve my skills and abilities. Also, I involve myself in other activities and groups such as [Student Organization] that lead me to think creatively and brainstorm on what needs to be changed and to start new things. (R149)

In these two narratives we see both the emphasis on creative thought (*brainstorm*, *think creatively*, *thinking of new ways*) and the mention of social change and religion. The importance of social justice issues on this particular campus cannot be overstated. Both local service organizations and organizations such as Habitat for Humanity, Circle K International, and Alternative Spring Break were frequently nominated as "creative organizations." Finally, the religious devotion evident in the second quotation may strike some as unexpected in the context of creativity. Technically located in the "Bible Belt" and attracting a large proportion of its students from the southeastern United States (almost 50 percent in 2007), it may be that the religious and social conservativism associated with campus life is both real and influences students' perceptions of creativity. If this were the case, it may be that students' commitments to social justice causes are promoted by their religious beliefs and organizations and that this combination of traits distinguishes this campus from others.

Social Media creativity includes mentions of volunteering but more consistently includes various forms of engagement with media such as computers, Web site design, and several forms of written expression.[16] In the following description, R150 mentions movie making and poetry as features of creative activity:

I create mini movies on my computer by taking videos from my digital recorder camera that I create during parties, performances, and other events. In writing poetry I also express my desires and other emotions.

Other students mention Web page design (R27) and "*graphic/web design*" (R51), but the majority of responses in this type mention poetry or journal writing. Ten students cite poetry in particular, including R97, who is quite specific: "*In written expression, I choose to break with the line break convention of poetry when I can. I write poems and try to focus on new outlooks that invoke feeling as opposed to narrative blips.*" As one might expect, the creativity of poetry writing is also manifest in its importance as a venue to "*express . . . desires and other emotions*" (R150), express "*my inner emotions on a particular subject*" (R28), and because of "*the power that those words have. No one can erase print—it sticks in their minds.*" Some students mention short story and nonfiction writing, even noting, "*I don't like physical performances and would prefer to write poetry or short stories. I am not necessarily a very vocal person and express myself through writing*" (R139). This mention of creativity as an antidote for introversion stands in opposition to the dominant "social" trends in the data.

Finally, *Gregarious* creativity includes mentions of conversation, humor, and references to features of general behavior or disposition, and responses in this category suggest an "outgoing" element to sociability. While there are clear affinities with

Networking creativity, we would consider gregariousness a more generalized—rather than instrumental—form of interaction. R11 and R84 illustrate this type of creativity:

> *I enjoy playing devil's advocate in conversations to joke around and get my friends riled up and just have fun with it in general.* (R11)
>
> *In conversation, by use of wit, humor, and reference to cultural forms (film, music) . . . creativity exists as a form of accomplishing normal tasks of school or social life. . . .* (R84)

For R11, the emphasis on sociability in the form of interacting with friends and provoking a response suggests someone who likes to be the center of attention, exerting his or her individuality within the bounds of the group setting. For R84, the focus is on the ways in which thinking and communicating can be creative. This strikes us as similar to the decision making that is earmarked in so many psychological studies of creativity and of the particular forms denoted "everyday creativity." When R84 writes "*creativity exists as a form of accomplishing normal tasks of school or social life,*" we understand how deeply linked the creative self (or perception of one's self as creative) can be to one's everyday activities. We also note the balance between conformity (normal tasks) and individuation (experimenting with assignments). And in both responses, we note an interconnection of activity to selfhood that can undergird studies of creativity.

One point worth noting here is that slightly more than half of students (51 percent) are captured by a single creative type, whether *Networking*, *Renaissance*, *Nurturing*, *Idealist*, *Social Media*, or *Gregarious*.[17] The remaining students either loaded strongly on multiple factors, or their self-reported dimensions of creativity failed to load strongly on any of these six factors, suggesting more multiplex creativity that cannot easily be characterized. Although this finding can only be suggestive, it is harmonious with theories of both multiple intelligences (Gardner 1993) as well as the notion that people are creative across multiple domains (Root-Bernstein 1988). We also note that types of creativity are not equally distributed across the student sample. *Social Media*, *Gregarious*, and *Networking* types of creativity are much more prevalent in the student sample than are *Renaissance*, *Nurturing*, and *Idealistic* creativities.[18] This reinforces our prior observation of an undercurrent of "social" creativity among this sample of students.

In order not to discard valuable data, we next performed a nonmetric MDS analysis on the 19 creative items that fall below a common significance threshold in the preceding factor analysis. We felt there was promise in identifying some of the more idiosyncratic items nominated by students and found that MDS might allow us to draw some conclusions about these items. Figure 1 illustrates the results, in which we represent—in a two-dimensional graph—the 19 creative items.[19] The graph arrays these items such that the further apart two items are, the less often were they mentioned together in student accounts.

Here we see moderate clustering in a central area that includes items we might term forms of "intellectual/artistic" creativity. An outer ring of routine, "everyday" creative dimensions surrounds this core. However, when we compare frequencies of items in this ring with Table 2 (Frequency of Self-Reported Creative Dimensions), it seems more intuitive to classify these as residual items owing to their low frequencies. The propensity
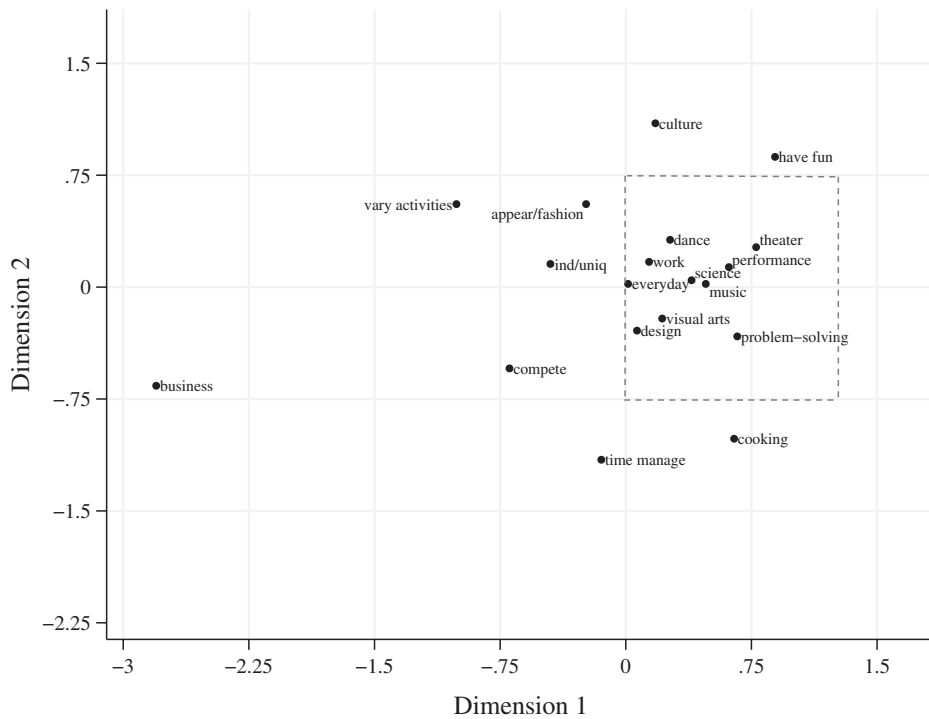
FIGURE 1. Nonmetric Multidimensional Scaling of Low-Loading Creative Dimensions.
Note: The clustered creative items at the upper right denote an "intellectual/artistic" grouping.

for intellectual and artistic forms of creativity to cluster together harmonizes with what we know of students' socialization processes in higher education and "big C" creativity in general. Still, the finding of some structure among this set of creative items—along with structure discovered in the factor analysis—may suggest the presence of a set of norms to which students both *respond to* and *actively shape* via both the conformity of behaviors and expressions of individuality.

DISCUSSION

Creative (and social) engagement with the world does not lead to a limitless field of creative possibilities—where individuals distinguish and express themselves with abandon. Instead, when creativity is enmeshed in daily routines and social life, it must contend with the pushes and pulls, the norms and expectations inherent in social interaction. Thus, individuals must negotiate a balance between distinctiveness and individuation and adaptation to their social context—including roles, obligations, norms, and conventions. While some might lament these constraints, pragmatists would argue that students discover their creativity precisely *as the result* of negotiating, over-coming, and occasionally standing against the structures of campus life.

The primary objective of our research was to investigate the social patterning of students' lived experiences of creativity on a college campus. We observed a tendency in creativity research to place a high value on individual acts of extraordinary achievement and also to situate creative action predominantly in the arts and sciences. With this in mind, we wondered whether students' creative experiences would be similarly bounded given a range of competing findings on everyday creativity grounded in daily experience. As a starting point, we turned toward thinking in the pragmatist tradition that explores the intersection of creativity, constraint, individuality, and group embeddedness and followed these threads to contemporary sociological work that expands upon the dynamics of creative action.

We posited that a college campus is an ideal research setting because it is a bounded social milieu in which students navigate notions of individual and group in a variety of ways. Turning toward self-reports of how students experience creativity, we first analyzed the content of these "creativity narratives" and then used correlational methods to describe relationships among modes of creativity in the data structure. To help illustrate the types of creativity we discovered through this procedure, we highlighted several individual student narratives that represented the six types.

Our results suggest the presence of a wide spectrum of forms ranging from "big C" to "little c" creativities, with a surprising number of students perceiving social interaction—as contrasted with individual extraordinary effort—as a primary domain of creative activity. Several other key observations follow. Notably, students distinguish themselves via myriad types of everyday creativity that reach far beyond the traditional emphasis on the arts and sciences and intersect with a wide range of daily activities. Moreover, patterns in the data suggest that students are actively conforming to local norms of sociability as they seek to distinguish themselves. We discuss several ways in which we might interpret these observations about creative experience among these students.

Diverse Creativities

The diversity of forms of creativity on this campus is far more substantial than we would have expected given popular—and some scholarly—conceptions of creativity. At the same time, this finding further animates Willis's (2005) claim pertaining to the immense range of experiences relevant to young peoples' lives. In this study, individuals mentioned conversation, volunteering, fashion design, decorating their dorm rooms, and even deciding on titles for their course papers as expressions of creativity. Students play the oboe and guitar; they take photographs, bake, sing, and write poetry, songs, short stories, computer code, and greeting cards. Students are creative in science labs, engineering classrooms, and the theater design shop. One student has two pending patents for medical products and reported having developed several magnetic resonance imaging techniques. Three students noted that they expressed their creative impulses in choices of dress, hairstyles, and shoes. They dance in a range of dance groups and classes, among them African dance, step, and ballet. One student wrote, "*I have an exceptional ability to create elaborate analogies between biological pathways and real life situations*"

(R38). Another student noted that her creativity was focused on "*Making links between cross-disciplines studies* [sic], *i.e., realizing that most departmental distinctions are not justified and it all relates on a level*" (R67). One of the most amusing responses noted that the student was creative while "*Creating new liquids to imbibe*" (R68).

Everyday Creativities

Almost all the students we queried located forms of creativity in their everyday lives, extending beyond the sciences and arts. This is harmonious with the thinking of early pragmatists as well as scholars of everyday or "little c" creativity. We argue that in these narratives, students are developing and describing forms of distinction from their peers—ways in which they can express their individual contribution to the community. For some students, it was exactly the college atmosphere that encouraged their creativity: R142 writes,

> *Day by day I feel my creativity is growing while I attend college. I have been able to expand my creativity by taking a variety of classes, through student organizations and through different cultural experiences that [University] offers to its students. As I learn more, I learn about myself, who I really am, and what I want to become in the future.* (R142)

This student eloquently articulates what college administrators hope will be the case; universities seek to offer a diversity of experiences so that students can identify and nurture their values and tastes and develop and hone personal and professional skill sets, of which creativity is one. This proactive and productive understanding of creativity as a means to interpret one's identity, through a "story line" or narrative arc, resonates strongly with White's (1993) vision of the situational embeddedness of individuals in networks and narratives.

Creative Sociabilities, Constraints, and College Life

There is no narrow conception of creativity among these students, and over and over again the narratives emphasize the role of creativity as a form of unique, individual expression, yet also a form that was often explicitly contextualized in a social milieu. They mention "*introducing . . . new thought and concepts*" in classes (R7), creating "*my own accompaniments to the music selections*" (R10), "*playing devil's advocate*" (R11), and that "*In conversation, I often make connections that others don't*" (R23). Students wrote, "*I love to capture unique moments and images with my camera*" (R32), and that they think "*of innovating and stimulating ways to communicate with my classmates*" (R33). Certainly, some of this should be expected in response to a question that directly asks "*How do you . . .*," but the explicit focus on forms of innovation and individuality in combination with the breadth of kinds of activity mentioned point toward the role of creativity as an individuating feature of college life.

But in the student narratives, we also find that students felt pressure to express creativity in particular ways, and sensed limitations in their ability to be creative. In particular, we saw evidence of an impulse toward conformity in the narratives themselves. We also see two potential proxy measures of external constraints: first, the

strength of the social types produced through factor analysis, and second, the predominance of certain domains (and absence of others) in the student narratives, suggesting a normative dimension across the population.

Many students addressed conversational creativity by noting their deviation *and* assimilation to norms: R157 wrote, simply, "*In conversation I tend to be predictable/ unpredictable.*" This creativity extends to event planning and group activities, specifically in order "*to meet the goals of the group in a fun, productive manner*" (R114). In school-work, "*studying differently than others or doing things in a different way than others*" is praised as long as it gives "*me an edge*" (R48), "*so that I can stand out*" and "*am memorable*" (R90). Thus, students are aware that their creativity is bounded by expectations, the "goals of the group," and by their own concerns about success (getting an "edge").

We opened our analysis with an extended excerpt from one respondent who noted: "*In artistic performance, I view the study of kung fu/tai chi to be creative and expressive, albeit only after learning the conventions of the domain of martial arts.*" Similarly, in several student narratives, expertise or lack thereof was mentioned as a constraint on creativity. For example, R11 notes that he is not musically creative because although "*I also enjoy listening to music immensely . . . I am musically challenged (can't sing, dance, play an instrument, etc.).*" The desire to express one's self in particular ways—but the inability to do so because of a lack of expertise or knowledge of conventions—is one form of constraint upon creativity.

The students who noted their lack of expertise in creative domains were joined by students who had difficulty identifying their creative activities as such because they were not "typical" creative activities. It seems these students had internalized the heroic notion of creativity that delimits activity to the fields of artistic and scientific activity. For example, R92 notes, "*[I am] not artistically creative at all but I see myself as creative in Business applications.*" Another student is hesitant to identify scientific work as creative: "*I guess I'm creative in biological research. [I] Need to think of experiments and setups to address hypotheses.*" In another narrative, a student identifies himself as a creative "structural hole" (c.f. Burt 2004) in the network of student organizations, only to back away from identifying that work as creative: "*because I am involved in many things, I am able to see the good and bad of different organizations and help spread the good. That's not particularly innovative, but it is knowledge spreading*" (R77). In these narratives, it is clear that students' ability to experience creativity is bounded by their understanding of what is properly classified as such. One function the university may play is in broadening or delimiting the notions of creativity that students bring with them to campus.

Some students noted that the multiple demands of college life made it difficult for them to maintain creative expression in their everyday lives, a finding giving additional support to the claim that some features of the college experience can inhibit creativity (Clydesdale 2007). For example, R15 explained, "*I used to be more creative than I am now. I used to participate in a lot of Studio art, especially Raku Ceramics. I don't have time in college, especially with a double major, a girlfriend, and holding an officer position in my*

frat[ernity]." Another student, after noting their enjoyment of drawing and photography, said, "*My major doesn't permit me a lot of time to do this*" (R117). On the other hand, one student noted that managing the multiple demands of college life promoted creative problem solving: "*In the pre-med lifestyle, you have to be creative in order to accomplish all you have to do in the time given. Examples include laminating flash cards so they can go with you everywhere, including the shower. [smiley face] And the hours per week? Ha, it never stops*" (R110).

Outside of students' majors and other academic commitments, they also spend a tremendous amount of time in extracurricular activities. Students overwhelmingly noted involvement in Social Service organizations; moderate involvement in Greek, Arts, Professional, Student Life, and Sports organizations; and lesser involvement in Ethno-Racial, Religious, Political, and Honor Societies.[20] We also observe that a clear organizational membership norm among this sample of students seems to be "the more the better."[21] At minimum, this indicates that students have a number of diverse venues in which they might distinguish themselves, yet it suggests a commensurate number of sources of social constraint as well.

Another consideration is that the creative types that emerge from students' narratives may reflect forms of underlying social constraint that limit individuals' acknowledged experience of creativity or the actual expression of creativity itself. That is, forms of creativity that do not "match" a type may be overlooked and, consequently, may play a small role (or no role at all) in how students think about, experience, and tell us about distinction. For example, intimate relationships with family and sexual partners were not mentioned in any of the student narratives. Museum attendance was not mentioned as a form of creative engagement. While a great many students mentioned the importance of writing, none of them admitted to being published authors, even in a forum with a low barrier to entry, like blogging. These "silences" may be meaningless—omissions caused by faults of memory or simply reflective of naturally variable tastes and preferences; or they may be meaningful indicators of locally censured forms of creativity. Other forms of qualitative analysis, especially ethnographic observation, are tools better suited to addressing the reasons for these absences. For now, we only note the patterns in the data and that the absence of some forms of creativity may indicate constraints thereupon.

CONCLUSION

Our analysis of creativity narratives derived from a sample of college students reveals that students experience creativity in ways that might be unexpected or that fall outside of what we typically think of as creative domains—art, science, and invention. We found six robust creative types, the discovery of which reminds us of the need to treat creativity as a differentiated set of phenomena. It further challenges us to consider how creative experiences may vary across individuals and to consider how this may influence students' experiences in education. Across all creative types, social interactivity emerges as a major focus for these students; many feel they are making a unique and creative contribution when they are helping others, exercising leadership, organizing events, and

simply hanging out and talking. Students' creativity narratives clearly express the ways in which these students feel distinctive—reinforcing notions that creativity is connected to self-expression and individuation. However, the very fact that creativity is reported as experienced in rather routine settings, where students are performing tasks and engaging in activities that are bound by social norms and expectations, suggests that for many students, creativity is less about "abandon" or pure expression and more about community and connection.

The same interactions that students find creative can also be constraining—influenced by peer-group culture, social roles, gender and class dynamics, and institutional routines. A task for future research is to understand the diverse ways in which individuals balance creativity and conformity and to better understand under what conditions personal expression and creativity can rise above, challenge, resist, or add meaning to otherwise routine and structured forms of social life. And, to the extent that everyday creativity can be a source of distinction as well as a source of autonomy, it is important for scholars to examine whether some individuals, in some contexts, are better able to tap into their creative potential than others. In other words, are there new sources of inequality that arise when we examine everyday creativity, or is such creativity a truly "democratizing" force in social life?

Future research might also examine whether there is a link between everyday creativity and those types that bring significant public value—such as discoveries in science, art, engineering, medicine, and business. We suspect that everyday creativity—given its ubiquity—is a critical arena for developing habits of creative thinking, for learning how to negotiate new ideas in the context of social interaction, and for developing one's creative identity and sense of efficacy. But there is very little research to determine how and whether people develop a "creative identity," whether such an identity is transferable across domains of activity, and whether engagement with diverse forms of everyday creativity prepares a person for more extraordinary creative endeavors.

Additionally, this analysis serves as a diagnostic of a particular campus. We have learned something about how a particular cohort of students in a particular place experience creativity. How will the reported experiences and the "creative narratives" be the same or different across institutional settings—at a small liberal arts school versus a large research university? Or at a historically black college versus a religiously based school or two-year college? Other campuses may exhibit more or fewer "creative types" that are more or less alike; this caveat should inspire comparative research. We can begin to have a sense of how campuses differ in ways that are not captured by *U.S. News and World Report* rankings, and perhaps in ways that are more pressingly important to students and parents, as they reflect aspects of both social and academic life.

Moreover, campus administrators should be interested in understanding the creativity narratives of students as a mechanism that can influence policy decisions. For example, while educators are increasingly recognizing and returning to John Dewey's prescient observation that experience is a key to learning, a focus on the everyday forms of creativity can help us to exploit this insight even further. Learning is enriched if it is personal, meaningful, and directly tied to a student's experiences. To the extent that

students exercise their creative capacities through hobbies, personal expression, technology, fashion and music, religion, volunteering, and social connectivity, then we must organize teaching and learning to place these experiences more thoughtfully in the education process. Based on the evidence reported here, a great deal of the creative lives of students takes place outside the classroom, during free time and in informal settings. Educators who wish to nurture a "creative campus" must take seriously these forms of creativity.

These particular trends—the intense sociability, the focus on literacy, even the presence of arts and crafts and new media—reflect larger societal trends. The rise of social networking sites on the Internet and the increased value placed in networking as a business activity are reflected in these students' experiences. Arts and crafts activities like scrapbooking and knitting have experienced a recent boom in popularity. Scholars and critics have talked about the rise of "pro-ams"—professional amateurs who invest significant time in their creative hobbies and who share their work with like-minded pro-ams from around the world (Tepper and Ivey 2007). And there is abundant discussion and analysis about the changing economy and the rise of the "creative class," the importance of aesthetics, design, and creativity in the new economy and the creative ethos of young, well-educated knowledge workers (Heartfield 2000; Pink 2005; Tepper 2007).

The everyday creativity that we find in the narratives of college students connects with these larger trends. Creative sociability might well be a defining social form in the 21st century, undergirding a range of social experiences in college and beyond, providing students and citizens with the skills and dispositions necessary to navigate a global economy, and serving as a key process whereby individuals negotiate the important balance between conformity and distinction.

ACKNOWLEDGMENTS

NOTES

[1]The stipulation of a synergistic relationship between creative individuals, environments, and experience also appears in George Herbert Mead's ([1934] 1962:222) research, whose claims suggest that the individual is *itself* a creative project, constituted in this dynamic relation of self to society.

[2]Most recently, Richard Sennett (2008) has carried on the pragmatist tradition by arguing that everyday craft and the mastery of technique are important sources of creativity that carry over into social life, "anchoring people in material reality" and offering people "alternative, viable proposals about how to conduct life with skill" (11).

[3]For further background on the "Sensation" art exhibition, see Barry and Vogel (1999); Barstow (2000).

[4]These changes are echoed in campus mission statements and in the resituation of campuses to carve out a niche in the new "creative economy," sometimes in the form of new degree programs in intellectual entrepreneurship (Madden and Bloom 2004; Pink 2004; Cherwitz and Beckman 2006).

[5]Our use of "social interaction" primarily follows a Deweyian concern with situated social experience, although our objectives differ from others who have theorized dynamics of social interaction, that is, micro-interaction (Collins 2004) or symbolic interaction (Fine, Martin, Sandstrom 2002). Our data structure differs as well insofar as our data are not "interactive" or analyzed within a longitudinal or even cross-sectional apparatus.

[6]This survey question we focus on here was part of a more extensive project. While 159 students returned surveys with demographic data (gender, race, citizenship) and academic data (class cohort, major, minor), not all answered the question "How do you pursue or express [creativity]?" We focus here only on the group of 128 who responded.

[7]The software package AtlasTi 5.0 (Muhr 2004) was used to organize these data.

[8]For instance, R2 says, "*I am creative in a musical manner—I play the oboe and the piano. I also love to create things with what I have available, and I have always been this way. I also believe I can be creative in the realm of the sciences, as I am a science major. I like to be creative in my writing as well.*" We thus code R2 for "music," "everyday," "science," "writing." Following the initial round of coding, 10 percent (N = 13) of narratives were randomly resampled, and codes were compared with the original set, yielding a measure of intercoder reliability of 96 percent.

[9]See *Appendix: Exploratory Factor Analysis & Multidimensional Scaling Methodology*" for more detail on our procedure.

[10]Any cursory glance through colleges' admissions literature or mission statements will illustrate the multiple ways that colleges attract students by promising students they will find their own personal niche. Consider the following, from the mission statement of Iowa State University: "The primary mission of the College of Liberal Arts and Sciences is to prepare students to become knowledgeable, contributing citizens in a world of diverse cultures. Vital to the mission of the College is the discovery of new knowledge through teaching and learning, research and *creative activity*. The role of the College is to nurture and sustain the learning and understanding achieved" (italics ours; http://www.las.iastate.edu/about/mission.shtml, Accessed January 10, 2009).

[11]"Big C" forms of creativity include *academic work*, *science*, *music*, *visual art*, *dance*, *theater*, *design*, *performance*, and *arts appreciation*.

[12]"Little c" forms of creativity include *conversation*, *group activities*, *everyday*, *thinking*, *behavior*, *interaction*, *problem solving*, *event planning*, *individuality*, *friends*, *networking*, *appearance*, *athletics*, *crafts*, *computer*, *volunteering*, *humor*, *social change*, *cooking*, *culture*, *media*, *business*, *children*, *competition*, *having fun*, *religion*, *time management*, *travel*, and *varying one's activities*.

[13]Social creativities include *conversation*, *group activities*, *interaction*, *friends*, *networking*, and *competition*.

[14]Our observation seems more in line with a more recent iteration of the same survey, which described a rise in literary reading among adults (NEA 2009).

[15]Roberta Shapiro, Erasmus University, June 2008. Conference talk.

[16]We hesitated from denoting this type "literary" since newer media with a social focus dominated factor loadings. Also, the cross-loading item "volunteering" may in fact be more appropriately captured by *Nurturing* creativity.

[17]An individual could be considered "captured" by the factor if that person nominated *any* high-loading item in that variable. We err on the side of generous inclusion criteria because greater precision in such a small sample yields an unrevealing level of resolution. 50.8 percent (N = 65) were captured by one factor; 19.5 percent (N = 25) were captured by two factors; 4.7 percent (N = 6) were captured by three factors; 1.6 percent (N = 2) were captured by four factors. 23.4 percent (N = 30) nominated creative dimensions too diffuse to be captured by the six-factor solution (or alternately, dimensions too sparse to create meaningful correlation with others).

[18]Number of students captured by each type: *Social Media* (N = 45); *Gregarious* (N = 35); *Networking* (N = 25); *Renaissance* (N = 15); *Nurturing* (N = 12); and *Idealistic* (N = 7). Students could be captured by more than one type.

[19]The solution was obtained by summing individuals' identity matrices of creative dimensions; a two-dimensional solution obtained a stress measure of .058, signaling a well-fitting solution.

[20]Involvement with Social Service organizations (N = 102 nominations); Greek (N = 56); Arts/Media (N = 49); Academic/Professional (N = 45); Student Life (N = 43); Sports (N = 41); International/ethno-racial (N = 32); Religious (N = 27); Political (N = 22); Honor Society (N = 18). Students were allowed to nominate as many as they wished.

[21]Affiliation with five organizations (N = 44), four organizations (N = 27), three organizations (N = 21), two organizations (N = 19), one organization (N = 12), and none (N = 5).

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APPENDIX: EXPLORATORY FACTOR ANALYSIS & MULTI-DIMENSIONAL SCALING PROCEDURE

Our analysis procedure consisted of a two-step exploratory factor analysis (EFA) followed by multi-dimensional scaling (MDS). While there is no clear agreement on "best practices" of EFA because of specificities in contextual data demands and disciplinary cultures, it continues to be widely used in sociology, psychology, education research, and political science (Gorusch 1983; Floyd and Widaman 1995; Osborne and Costello 2005). To reiterate a commonly voiced cautionary note, EFA is not a modeling technique for testing hypotheses, so it is suited to our exploratory, hypothesis-generating aims.[1] We choose to use factor analysis on the basis of a theoretical assumption that creativities can be multiple within individuals, rather than relying upon clustering techniques which group individuals together. In doing so, we avoid the problem of restricting any one individual to any one creative type, and allow for multiple types of creativity to emerge both within and between individuals in the sample population.[2]

 Of two commonly used methods (principal factor analysis and principal component analysis), we choose iterated principal factor analysis to extract factors because our interest lies more in prioritizing relations between reported creative dimensions rather than simply data reduction. We utilize an oblique promax rotation schema. This allows for correlation of factors, which is harmonious with an underlying theoretical assumption that creative dimensions are not independent in individuals' lives. Appendix Table 1 reports on the factor loadings.

    An initial scree plot of eigenvalues suggested a factor solution with less than ten factors. We used an ad hoc combination of the common "elbow" test (the point at which

APPENDIX TABLE 1. Detail of Exploratory Factor Analysis Loadings

Variable	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Uniqueness
Appearance/fashion	0.0675	0.0690	0.0929	-0.0575	-0.1325	-0.2052	0.9349
Arts appreciation	-0.0376	**0.5675**	0.0608	-0.0156	-0.0629	0.2433	0.5795
Athletics	0.0317	**0.4519**	0.0286	-0.0382	-0.0057	0.0697	0.7812
Behavior	0.2092	-0.0381	-0.0324	-0.0736	-0.0589	**0.3303**	0.8302
Business	-0.0027	0.1663	-0.0175	0.0035	-0.0156	-0.0555	0.9699
Social change	0.0098	-0.0157	-0.0444	**0.8797**	-0.0437	0.0438	0.2215
Children	0.0097	-0.0345	**0.7845**	0.0349	0.0169	-0.0223	0.3777
Competition	-0.0017	-0.0260	-0.0264	-0.0170	-0.0367	0.0365	0.9955
Computer	-0.0245	-0.0119	-0.0482	-0.0323	**0.4243**	-0.0156	0.8222
Conversation	-0.0220	-0.1005	0.1636	-0.0239	-0.0494	**0.6065**	0.5887
Cooking	-0.0600	-0.0211	-0.0192	-0.0267	0.0791	0.0159	0.9897
Crafts	0.0177	0.0167	**0.5725**	-0.0401	-0.1281	-0.1580	0.6725
Culture	0.0131	-0.0415	-0.0436	-0.0074	-0.0214	0.2044	0.9554
Dance	-0.0969	0.2657	-0.0205	-0.0348	0.1846	-0.1598	0.8677
Design	0.0512	-0.0323	0.0976	-0.0997	-0.0940	-0.3014	0.8907
Event/Party Planning	**0.7703**	-0.0121	-0.0526	-0.0562	0.3084	0.0781	0.2726
Everyday creativity	0.2253	-0.0500	0.0642	-0.0695	-0.1745	-0.2963	0.8448
Friends	-0.0291	0.0020	**0.5280**	-0.0481	-0.1632	0.2331	0.6443
Group activities	**0.7104**	0.0175	0.0338	0.1580	-0.1530	0.0386	0.4545
Having Fun	-0.0316	-0.0554	-0.0598	-0.0403	-0.0074	0.0715	0.9869
Humor	0.0523	0.0678	0.0096	-0.0497	-0.0046	**0.5152**	0.7147
Individuality/uniqueness	0.1957	0.0036	0.0564	-0.0411	-0.1432	0.0103	0.9430
Interaction	**0.4410**	-0.0070	-0.0037	-0.0602	-0.1332	-0.1611	0.7745
Media	0.0169	0.0255	-0.0635	-0.0109	-0.0326	-0.0129	0.9490
Music	0.0255	-0.0087	0.0371	-0.0469	**0.6328**	0.1422	0.6071
Networking	**0.6653**	0.0116	-0.0393	-0.0389	-0.0167	-0.0025	0.5526
Not Creative	0.1182	**0.5798**	-0.0213	-0.0035	-0.0450	-0.0710	0.6480
Performance	-0.0762	-0.0482	-0.0289	-0.0104	-0.0517	0.1249	0.9737
Problem Solving	-0.0053	-0.0357	-0.0224	0.0150	-0.0257	-0.0991	0.9868
Religion	0.0545	0.0056	-0.0444	**0.7631**	-0.0294	0.0057	0.4127
Science	0.0488	-0.1088	-0.0735	-0.0742	-0.1205	-0.1283	0.9417
Theatre	0.0341	-0.0421	-0.0829	-0.0302	0.0003	-0.0523	0.9854
Thinking	-0.1031	-0.0511	0.2162	**0.4121**	0.0329	-0.0809	0.7528
Time management	-0.0460	-0.0092	-0.0294	-0.0088	0.0115	-0.0329	0.9955
Travel	-0.0464	**0.8781**	-0.0198	0.0085	0.0395	-0.0500	0.2331
Vary activities	-0.0303	-0.0118	-0.0186	-0.0031	-0.0266	-0.0359	0.9963
Visual art	-0.1187	-0.0630	-0.0909	-0.0672	0.0930	-0.1381	0.9393
Volunteering	0.0198	-0.0007	**0.5490**	0.0542	**0.5690**	-0.0254	0.2614
Work (academic)	0.0115	-0.0872	-0.0751	-0.0190	-0.1509	-0.1760	0.9296
Writing	-0.1482	-0.1176	-0.1862	-0.0679	**0.3682**	0.1807	0.8048

Note: Bold text indicates factor loadings > 0.32.

the plot of eigenvalues levels out) and a standard of including eigenvalues >1.0, with priority given to the former. The most interpretable is a six-factor solution, with a discernible elbow; a low incidence of cross-loading items (only "volunteering" cross-loaded on two factors); and more than 3 items loading per factor.

It should be noted that there is a roughly 3:1 subject-to-item ratio among 128 members of our survey sample who report on 40 dimensions of creativity. This ratio is generally considered below minimum thresholds for exploratory analysis. However, because we use an iterated principal factor algorithm (which has the effect of dropping low-communality variables), our results are similar to a case where we only demanded a factor solution from the 21 high-loading items, mirroring a much stronger 6:1 subject-to-item ratio.

Having assessed the factor structure, we then examine finer-grained patterning of excluded items using a multi-dimensional scaling (MDS) analysis (for methodological overviews, see Kruskal and Wish 1978; Young and Hamer 1987. For recent applications, see Lively and Heise 2004; Gravlee 2005).[3] Colloquially, this descriptive technique allows us to see, at a glance, *"Is there any finer-grained patterning to students' nominations of these additional nineteen creative items?"* If each student's narrative is completely idiosyncratic and shares nothing with her peers, we should merely expect a random pattern of points in the visual representation. However, if two (or more) creative items are more often mentioned together in students' creativity narratives across the population, these items will appear closer in proximity to one another in the MDS output.

To be clear, dimensions excluded from the factor analysis (and then amenable to finer-grained MDS scrutiny) does not mean that these creative dimensions are somehow "not important" to students. After all, each nominated dimension of creativity represents an aspect of life that students reported to be meaningful. It would also be fallacious, for instance, to consider any discrete groupings in a MDS as factors similar to those found in EFA. What we can say is that these nineteen dimensions excluded by EFA (and then scrutinized using MDS) have more in common with one another than they did with any of the six factors; MDS then is useful to us in ascertaining whether rough structure exists among these dimensions.

APPENDIX NOTES

[1]A useful precedent for the use of this technique in creativity research comes from the mid-twentieth-century psychological research of J. P. Guilford, who advocated the need to study the multi-dimensionality of creativity to psychologists (Guilford 1950). Guilford would go on to develop his Structure of Intellect (SI) model, using factor analytic methods to understand creative abilities (Guilford 1972, 1985). More recently, Ivcevic and Mayer (2006) have examined associations between personality traits and creative types among a population of college students in order to better document varieties of everyday experience. Using clustering techniques on responses to a survey of creative activities, they characterize five types of individuals: conventional, everyday creative, artists, scholars, and renaissance individuals.

[2]We use a procedure implemented in Stata/SE 10.0 (StataCorp 2007).

[3]We use the software package UCInet 6 (Borgatti et al. 1999) to perform this procedure.

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