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Wage Slavery or Creative Work?

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Abstract

Western philosophical and scientific traditions often view human work as inherently onerous, wearisome, and degrading. Adam Smith, writing in the eighteenth century, saw work as the toil and trouble that is the real price humans pay for everything they need or want. Karl Marx, writing in the nineteenth century, considered wage labor alienating, but saw the possibility of self-expressive work. Dupré and Gagnier, a philosopher and a critic writing near the end of the twentieth century, agreed that work could be self-fulfilling, but only for an elite minority. This article summarizes the Western philosophical views of work from ancient to modern times. It reframes the philosophical positions as empirical questions and addresses them with statistics and models drawn from a 1995 U.S. survey. Observations suggest that work, in modern America, is *not* usually alienated. The great majority of Americans rate their paid work or other main daily activities (mostly unpaid work) as more autonomous and creative than not. Emotional well-being and the sense of control over one's own life increase with the degree of autonomy and creativity. The employed report less autonomous but more creative activity than do the nonemployed. Emotional well-being and perceived control correlate more strongly with creativity than with autonomy. The overall association thus favors employment, especially for the poorly educated, even though they give up more autonomy when employed. On the whole, work in modern America seems more self-fulfilling than onerous, alienating, or degrading.

Keywords

education; internal-external control; psychological distress; psychosocial resources; work

Work. What is it, why do we do it, and what do we get from it? Is work simply the human cost of everything we need or want, or is there something more to it? Does work flow from something in human nature, unseen but real, the thwarting of which sours the mind and sickens the body?

The ancient Greek philosophers disagreed about many things, but they shared a common view of work. Platonists, Epicureans, Hedonists, Stoics, Aristoteleans—they all agreed—*work* is what your *slaves* do. A man without slaves is in no position to perfect the role of statesman or philosopher, the only truly worthy professions. A man without slaves must, in effect, enslave himself. This is how Aristotle describes the ideal citizen of the perfect state:

Now, since we are here speaking of the best form of government it clearly follows that in the state which is best governed the citizens must not lead the life of mechanics or tradesmen, for such a life is ignoble and inimical to virtue. Neither

must they be husbandmen, since leisure is necessary both for the development of virtue and the performance of political duties. (Aristotle 2011b)

So, it is not just slaves whose work is ignoble and inimical to virtue. Elsewhere, Aristotle says, “All paid jobs absorb and degrade the mind” (Aristotle 2011c). In other words, working for pay is no better than slavery. Indeed, paid work may be worse. Slaves provide the household necessities and luxuries that sustain the noble and virtuous lords—Plato, Pythagoras, Epicurus, and Aristotle to name a few. Paid work frees no one and combines degrading toil with even more degrading trade.

Alain de Botton (2011), author of *On the Pleasures and Sorrows of Work*, notes that,

For thousands of years, work was viewed as something to be done with as rapidly as possible and escaped in the imagination... Aristotle was the first of many philosophers to state that no one could be both *free* and *obliged* to earn a living.

On the other hand, Aristotle also is credited with having said, “Pleasure in the job puts perfection in the work” (Aristotle 2011a). “Pleasure in the *job*?” Surely this means a task, but how can a task be pleasurable? And how and why does finding pleasure in a job put perfection in the work? And does this include the ignoble work, inimical to virtue, of the tradesman, mechanic, or husbandman—the work that, when paid, absorbs and degrades the mind? There is in the statement a glimmer of another view of work, or perhaps another aspect of it—something that enhances the engaged mind, inspiring a better product.

The modern American definition of *work* seems a long way from the classical view of degrading toil engaged in of necessity. The American Heritage Dictionary (2011) gives the primary definition as “physical or mental effort or activity directed toward the production or accomplishment of something.” Additional definitions mention employment; the means by which one earns one’s livelihood; something that one is doing, making, or performing; and so on. The classical view reappears under synonyms. *Labor*, the dictionary says, is largely restricted to human effort, especially physical and manual. *Toil* is principally applicable to strenuous and fatiguing labor; *drudgery* to dull, wearisome, monotonous, and sometimes demeaning labor.

Writing around the time of the American Revolution, Adam Smith, a moral philosopher and founder of economics, took a far more positive view of paid labor and trade than Aristotle’s (Dupré and Gagnier 1996). For Smith, work transforms natural objects into things people need or want. The wealth of a nation is embodied in work, made efficient by a division of labor that is in turn made possible by trade and markets. Even so, Smith saw work as the real, *human* price of everything. “What everything really costs to the man who wants to acquire it,” he wrote, “is the toil and trouble of acquiring it” (Smith 1776).

Writing a century later, Karl Marx ([1884] 1964) agreed that work transforms the natural into the useful and that work is the real, human price of everything. However, he also saw the transformation of nature as necessary to an individual’s realization of full humanity (Mirowsky and Ross 2007). To achieve that realization, Marx thought, purpose and labor must be united within the individual. When the conception and the execution of labor are divorced, work becomes alienated and oppressive.

In his writing, Marx ([1884] 1964) contrasted the oppressiveness of nineteenth-century industrial working conditions with an ideal of self-expressive work. He wrote of jobs that were “physically exhausting and mentally debasing,” of humans used as replaceable and disposable parts in an *inhuman* productive apparatus, and of life sold off by the hour until there was little of value left. In particular, he wrote about wage slavery: turning over your own body and mind to be used as the instrument of someone else’s will. By nature, he

argued, human beings create things. Humans enjoy the things they create and the process of creating them. Somehow, according to Marx, the joy of creation had been lost in the nineteenth-century industrial machine. It made food, clothing, shelter, transportation, and wealth, but crushed something at the core of human nature: productive self-expression.

Marx ([1884] 1964) equated paid employment with the absence of autonomy, which in his view negated the possibility of self-expressive work. In his view, selling your labor (rather than its product) is selling your autonomy, thereby negating self-expression through the work.

Writing at the beginning of the twentieth century, Weber ([1904–1905] 1958) saw two attitudes toward work in the labor force of capitalist Germany. The traditional worker, steeped in the world view of medieval Catholic Europe, worked only as hard, long, and well as necessary to meet household needs. The modern worker, imbued with a capitalist, Protestant ethos, worked as hard, long, and well as possible, as if labor were “an absolute end in itself, a calling” (p. 62). To Weber, this attitude toward work is not a product of nature, but rather of “a long and arduous process of education.” The industrious, well-educated modern worker was in high demand “wherever it is a question of producing goods which require any sort of skilled labor, or the use of expensive machinery which is easily damaged, or in general wherever any great amount of attention or of initiative is required” (p. 61).

Sociologists writing in the 1950s and 1960s started to view paid employment as access to the tools of production. This implies access to the tools for self-expressive work. Equating paid employment with alienated activity, as Marx did, can obscure the real options in modern society. Merton (1961:49) describes the situation:

More and more people discover that to work, they must be employed. For to work, one must have tools and equipment. And the tools and equipment are increasingly available only in bureaucracies, private or public. Consequently, one must be employed by bureaucracies in order to have access to tools in order to work in order to live.

The quote focuses on access to the means of survival and prosperity. However, the tools and equipment accessed through employment provide more than wages, salaries, pensions, and insurance. They also provide the means of productive self-expression. The same may be said of bureaucratic hierarchy itself, which places the labor of some under the direction of others. In organizations the work of other people becomes a medium of production and thus a medium of self-expression. A hierarchy provides more control over that medium to some than to others, partly at the expense of those others. Even so, most employed individuals may gain more than they lose, just as composers, conductors, and musicians all gain an opportunity for creative work despite their hierarchical relationships. Moreover, beyond the means of production, paid jobs can provide a theater for self-expression—a venue of performance with an audience capable of appreciation (Mirowsky and Ross 2007).

Dupré and Gagnier (1996), professors of philosophy and English at Stanford, put the question well, writing in 1996 in the *Journal of Economic Issues*:

Is work fundamentally toil and trouble to be compensated or human self-fulfillment to be celebrated? One postmodern view might be that the goal of self-fulfillment is a modern illusion from a productivist ethos in which the human was whole and creative. In a full-blown market society, a consumerist society, in which we are not free to be or to create, but only free to choose between objects of consumption, the most we can hope for is to be fulfilled when we are not working. (p. 558)

Dupré and Gagnier admit that they personally see their own work as a source of value, both social and personal. However, they consider this an elite and possibly ethnocentric view. “The majority of people in contemporary societies,” they conclude, “do not do the kinds of work that could be a source of self-fulfillment” (Dupré and Gagnier 1996:558).

How do they know that? Their text does not cite a reference. Apparently, neither the authors nor the reviewers nor the editor considered one necessary. Viewed as a presumption rather than a fact, the statement itself seems elitist. Indeed, it seems perilously close to Aristotle’s view.

Is it true that the majority of people in contemporary societies do not do the kinds of work that could be a source of self-fulfillment?

First, let us be clear about terms. *Work* is an activity directed toward production or accomplishment. *Employment* is working for pay. Work, whether paid or not, may be interesting, engaging, and enjoyable or repetitious, tedious, and oppressive. It can be a creative expression of oneself, or it can be self-suppressing. In a market economy everyone needs money to get things they require or want, and most people must work for the money. In taking employment, individuals may give up some degree of freedom for pay. Do they also get an opportunity for greater creativity?

Although conceptually related, autonomy and creativity represent distinct aspects of work or other activities (Mirowsky and Ross 2007). *Autonomy* is the degree of self-direction, self-governance, and freedom from control by others in one’s activities. Autonomous activity is free from close supervision and allows decision-making latitude. *Creativity* is the degree of originality, imagination, and self-expression in one’s activities. Creative activity is interesting, challenging, complex, nonroutine, and fulfilling. In creative work, people solve problems, do different things in different ways, figure things out, and learn new things, using their skills to design and produce something.

Although too little autonomy likely stifles creativity, complete autonomy might not maximize it. Theoretically, some degree of autonomy is necessary for creativity. If workers are told exactly what to do and how to do it by a supervisor; if they must follow impersonal procedures, rules, and standards; or if their activities are governed by an assembly line, there is little room for innovation and creativity. However, very high autonomy may indicate isolation from ideas, exemplars, feedback, motivating influences, and partnerships that tap the distinct skills of others. The most challenging and interesting activities may involve a large degree of independence that nevertheless fall well short of complete autonomy.

Is work in modern America fundamentally toil and trouble that is, at best, compensated by pay and status? Is America, in effect, a land of wage slaves toiling in self-denial, whipped by needs and wants, chained by bills and debts, finding little self-expression other than consumer choices that merely increase the debt? Or is work for most Americans the fulfillment of a human need for self-expressive transformation of the external world, with employment a means to that end?

Previous Literature

The previous literature has not asked whether the majority of modern Americans see their paid work or other main daily activities as largely autonomous and creative. A few studies compare the employed to homemakers or retirees in these terms, and a body of studies correlates them with the mental or physical health of paid workers.

The few studies comparing paid workers to others find a trade-off: less autonomy among paid workers but more creativity. Compared with paid employees, full-time homemakers report work that is less creative but more autonomous (Bird and Ross 1993; Lennon 1994; Ross and Wright 1998). Similarly, retirees rate their work or other main daily activities as less creative but more autonomous than paid employees rate theirs (Ross and Drentea 1998). (About 80 percent of the retirees report their main daily activity as some kind of work: 50 percent housework or care for children or others; 12 percent gardening, yard work, or home maintenance; 8 percent unpaid work in a family business; and 4 percent each school work or volunteer work. Only about 20 percent report leisure activity: chiefly watching television, golfing, walking, playing cards, and visiting friends.)

Most research on the relevance of autonomy and creativity to psychological and physical well-being looks only at employed people. These studies typically combine measures of autonomy and creativity into a single measure, variously called occupational self-direction, job control, job latitude, or decision latitude. Among employed men, “occupational self-direction,” rather than ownership of the means of production or control over the labor of others, increases the sense of personal control (Kohn et al. 1990; Kohn and Schooler 1982), and “job latitude” increases the sense of control (Seeman, Seeman, and Budros 1988). The job strain model views work-related health problems as the product of high demands and low control or “decision latitude” (that is, low autonomy and creativity) and finds that job latitude, more than job demands, correlates with health (Fenwick and Tausig 1994; Karasek and Theorell 1990; Lerner et al. 1994; Reynolds 1997; Theorell 2000; Wickrama et al. 1997).

Ross and her colleagues find that the sense of control over one’s own life and psychological well-being correlate more strongly with autonomy and creativity than with authority over others; job prestige; occupational substantive complexity of work with data, people, or things; or the opportunity for promotion (Bird and Ross 1993; Ross 2000; Ross and Drentea 1998; Ross and Mirowsky 1992; Ross and Wright 1998).

Creativity and autonomy both correlate positively with physical health, but the estimated impact of creative work is about three times larger and more stable across models (Mirowsky and Ross 2007). Creativity has an association with physical health that equals or exceeds those of education and household income in size, statistical significance, and consistency across models. The results hold across a range of health measures, including self-rated health, the number and severity of impairments, the number of diagnosed chronic conditions, and indexes or latent factors constructed from these.

The question remains whether creative work and autonomy are as important for a sense of control and emotional health as for physical health. Indirect correlations seem likely, given the relationship of a sense of control and emotional well-being with physical health. However, if autonomous and creative work fulfills a human need for self-expressive transformation of the external world, then there also may be direct links not mediated by physical health.

Research Questions

The statistics and models reported next address the following questions about work in America at the end of the twentieth century. Is the work or other main daily activities of Americans seen by them as more autonomous and creative than not? Does employment trade lower autonomy for higher creativity of work or other activity? Do the well educated sacrifice less autonomy and gain greater creativity through employment? Is the work or other activity of the poorly educated more creative outside employment or less? What is the relationship of creativity to autonomy? Is it monotonic or parabolic? Is there an intermediate

level of autonomy associated with a maximum average creativity? How does the relationship differ for the employed and nonemployed? Which is more important to a sense of control over one's own life and to emotional well-being: autonomy or creativity? If the poorly educated yield more autonomy in employment for the creativity gained, how does this alter the overall association of employment with the sense of control and emotional well-being? Overall, in psychological and emotional terms, who gains the most from paid employment, the well educated or the poorly educated?

METHOD

Sample

The analyses use the 1995 survey of Aging, Status, and the Sense of Control (ASOC). It is a national telephone probability sample of U.S. households (Mirowsky and Ross 2007). Respondents were selected using a prescreened random-digit dialing method that decreases the probability of contacting a business or nonworking number. The ASOC survey has two subsamples, designed to produce an 80 percent oversample of persons aged 60 or older. The survey was limited to English-speaking adults. In the main sample, the adult (18 or older) with the most recent birthday was selected as respondent, and in the oversample the senior (60 or older) with the most recent birthday was selected. Up to 10 call-backs were made to select and contact a respondent, and up to 10 to complete the interview once contact was made. Interviews were completed with 71.6 percent of contacted and eligible persons: 73.0 percent for the main sample and 67.3 percent for the oversample. The final sample has 2,592 respondents ranging in age from 18 to 95.

Measures

The survey asked all respondents if they were employed full time, employed part time, retired, keeping house, a student, looking for paid work, or unable to work. *Employed* is a dummy variable coded one for those employed full or part time and zero for all others. A little over half are employed: 43.0 percent full time and 9.3 percent part time. Of the nonemployed, most are retired (26.6 percent of the sample) or keeping house full time (12.1 percent). The rest (8.8 percent) are roughly equally divided among going to school, temporarily unemployed or laid off, or unable to work because of a disability. The survey asked the nonemployed "What kind of work, tasks, or activities do you do mostly during the day?" (open-ended response). The large majority (about 77.2 percent) report some form of unpaid work: 50.7 percent housework or caring for children or the ill, 11.5 percent gardening or home maintenance, 6.6 percent unpaid work in a family business, and 4.2 percent each volunteer work or school work. The other 22.8 percent report something other than work: 15.2 percent recreation in the home, 6.9 percent recreation outside the home, and 0.8 percent looking for paid work or in rehabilitation or treatment.

The survey then asked everyone seven questions about autonomy and creativity, phrased in terms of "work" for the employed or "main daily activities" for the nonemployed.

Autonomy combines decision making and freedom from supervision. To measure decision making, respondents were asked, "Some people have supervisors or someone else who tells them what to do, while others make their own decisions. Who usually decides *how* you will do your work (daily activities)? Someone else decides, you and someone else decide about equally, or you decide? Who usually decides *what* you will do in your work (daily activities)? Someone else decides ... ?" The responses are coded -2, 0, or 2, respectively, for each question. Respondents also were asked, "Is there anyone who supervises your work (daily activities) or to whom you report?" Those who said yes were asked, "How free do you feel to disagree with the person who supervises your work (daily activities)? Would you say

you are not at all free, somewhat free, largely but not completely free, or completely free to disagree?” Responses are coded missing if no one supervises the work or daily activities and coded -2, -1, 1, or 2, respectively, for “not at all free” through “completely free to disagree.” The structural equation models (detailed later) use full-information maximum likelihood (FIML) procedures to implicitly interpolate the missing values assuming they are missing at random (MAR) given the observed values (Arbuckle 2006; Muthén and Muthén 2007).

Creativity is nonroutine, enjoyable, and provides opportunity for learning and solving problems. To measure nonroutine work or other activity, respondents were asked, “Does your work (daily activities) involve doing the same thing in the same way repeatedly, the same thing in a number of different ways, or a number of different kinds of things?” Responses are coded -2, 0, or 2, respectively. Respondents were then asked, “For each of the following questions, please tell me if you strongly agree, agree, disagree, or strongly disagree. My work (daily activities) gives me a chance to do things I enjoy. In my work (daily activities), I have to figure out how to solve problems. My work (daily activities) gives me a chance to develop and to learn new things.” The amount of agreement with each statement is coded 2, 1, -1, or -2, respectively, with “don’t know” coded 0.

The *sense of control* is indicated by two sub-scales of the Mirowsky-Ross 2×2 index (Mirowsky and Ross 1991). Each balances statements claiming control against an equal number denying it. One contains statements about good outcomes and the other about bad outcomes.

Each subscale codes the amount of agreement or disagreement with four statements. Responses to questions claiming control are coded strongly disagree (-2), disagree (-1), neutral (0), agree (1), and strongly agree (2), and responses to questions denying control are coded strongly disagree (2), disagree (1), neutral (0), agree (-1), and strongly agree (-2).

The *control-good* subscale averages scores for the statements “I am responsible for my own successes,” “I can do just about anything I really set my mind to,” “The really good things that happen to me are mostly luck,” and “There’s no sense planning a lot—if something good is going to happen it will.” The *control-bad* subscale averages the scores for the statements “My misfortunes are the result of mistakes I have made,” “I am responsible for my failures,” “Most of my problems are due to bad breaks,” and “I have little control over the bad things that happen to me.”

Distress is measured with indexes of *depression* and *anxiety*. All distress questions use the same question stem, response categories, and codes. Respondents were asked, “On how many days of the past week did you ...” The depression items are “... have trouble getting to sleep or staying asleep, ... felt you just couldn’t get going, ... had trouble keeping your mind on what you were doing, ... felt that everything was an effort, ... felt sad, ... felt lonely, and ... felt you couldn’t shake the blues?” The anxiety items are “... worry a lot about little things, ... feel tense or anxious, ... feel restless?” All items are scored in days per week, from 0 to 7. Each index takes the mean days per week of its items. The structural equation model uses the square root of each index to compensate for skewness.

Physical health is measured with three subscales.

Self-reported health is the respondent’s subjective assessment of his or her general health. Respondents were asked, “First, I’d like to ask you about your health. Would you say your health is very good, good, satisfactory, poor or very poor?” The responses are coded 2, 1, 0, -1, and -2, respectively.

Impairment is measured with a version of Nagi's (1976) scale. After a series of questions about lifestyle, respondents were asked, "Next I would like to ask you about difficulties some people have with everyday tasks. How much difficulty do you have climbing stairs? ... kneeling or stooping? ... lifting or carrying objects less than 10 pounds, like a bag of groceries? ... preparing meals, cleaning house, or doing other household work? ... shopping or getting around town? ... seeing, even with glasses? ... hearing (for those with a hearing aid, hearing, even with your hearing aid?)? Would you say no difficulty, some difficulty, or a great deal of difficulty?" Responses are coded 0, 1, or 2, respectively, and then averaged. The structural equation models use the square root of the average to reduce potential problems from skewness.

Dx count sums the number of problems reported in response to the following: "The next set of questions asks about conditions that some people have been diagnosed as having. Have you ever been diagnosed or told by a doctor that you have heart disease? High blood pressure? Lung disease like emphysema or lung cancer? Breast cancer? Any (other) type of cancer? Diabetes? Arthritis or rheumatism? Osteoporosis (brittle bones)? Allergies or asthma? Ulcers, ulcerative colitis, or other digestive problems?" The conditions represent the most common chronic diseases that threaten survival, function, and quality of life (Kochanek and Hudson 1995; Verbrugge 1986). The structural equation models use the square root of the number of reported conditions to reduce potential problems from skewness.

The structural equation models specify three exogenous variables: education, age, and gender. *Education* is measured by asking, "What is the highest grade or year of school you have completed." Answers are coded in 0 through 16 years up to a college degree (BS or BA), 17 for some graduate school, 18 for a master's degree, and 20 for a doctoral or professional degree (PhD, MD, JD, DDS, and EdD). Education is centered on 12 (years of education minus 12). As a result, intercepts represent predicted values for persons with high school degrees, and "main effects" for interactions represent slopes for persons with high school degrees. *Age* is measured by asking, "In what year were you born?" Age is the year of the survey (1995) minus the year of birth. Age is centered on 45 (years since birth minus 45). *Female* is a dummy variable coded 1 for females and 0 for males.

Structural Equation Models

Figures 1 and 2 and their related text describe the results of two structural equation models. Both specify latent factors representing the autonomy and creativity of work or other main daily activities. To identify the measurement model, one indicator of each latent factor has its unstandardized loading fixed to 1.0 and its intercept fixed to zero. For autonomy, it is "Who decides *how* you will do your work (main daily activities)?" For creativity, it is "My work (daily activities) gives me a chance to develop and to learn new things." The second model adds latent factors for the sense of control, distress, and health. The indicators with fixed loadings and intercepts are the *control-good*, *depression* (square root), and *self-reported health* scores, respectively.

The first structural equation model tests the hypothesis that creativity is a parabolic function of autonomy. The model was estimated in Mplus version 4.2, specifying type = random missing, estimator = MLF, and algorithm = integration (Muthén and Muthén 2007). This allows the estimation of a parabolic relationship between latent factors, as well as implicit model-based imputation of missing values assuming they are missing at random given the observed values. However, it does not yield standard fit statistics. Table 1 gives the structural-model results separately for the employed and the non-employed, as well as for the whole sample. The measurement parameters are not constrained to be equal across the two categories of employment (except for the ones fixed to 1.0 or 0 in both). Empirically,

some measurement parameters differ across the employment categories, but models with a mix of constrained and free or all constrained produce essentially the same results on the structural level. Figure 1 graphs the predicted values implied by the coefficients in rows 1, 2, and 8 of Table 1.

The second structural equation model tests the hypothesis that creativity is more relevant than autonomy to well-being and that the benefits associated with employment compared to nonemployment are greater the lower the level of education. The model was estimated in AMOS version 16, using full-information maximum likelihood (Arbuckle 2006). The results indicate a good overall model fit, as shown in Figure 2. The figure gives standardized coefficients for the measurement model as well as the structural model. Table 2 gives the unstandardized coefficients, *t* values, and *p* levels for the structural model.

RESULTS

Empirically, the results summarized suggest the following answers. Work, in modern America, is *not* fundamentally toil and trouble. By every sign, it appears to operate as the fulfillment of a human need. The great majority of Americans can and do find their employment or main daily activities more autonomous and creative than not. There remains, though, a minority lacking autonomy and creativity. Ironically, the poorly educated, who are most at risk of being in that minority, depend the most on paid employment for their emotional well-being, sense of control, and physical health.

Basic Breakdowns

Broadly speaking, 10 percent to 20 percent of Americans report little say in what they do or how they do it and find their paid work or unpaid activities to be routine, unchallenging, and unenjoyable. The other 80 percent to 90 percent, by far the large majority, report autonomy and creativity in their paid work or other main daily activities.

Autonomy Basics

Not surprisingly, results consistently show far less autonomy among the employed than among others. Even so, the employed report a substantial degree of autonomy. Of the nonemployed, 90 percent said they do not have a supervisor, and most of the rest reported being largely or completely free to disagree with their supervisors. In terms of supervision, paid employment clearly sacrifices a fair amount of autonomy. Of employed persons, 80 percent reported having a supervisor. Even so, the large majority of the employed reported a substantial degree of autonomy. One in five had no supervisor, and three in five said they have a supervisor they are largely or completely free to disagree with. About 17 percent said they are only somewhat free to disagree, and only 3 percent said they are not at all free to disagree.

Two other measures of autonomy show a similar pattern. Once again, the nonemployed report far more autonomy than the employed. About 85 percent of the nonemployed say they decide what to do and how to do it. Almost all the rest say they and someone else decide about equally. However, the employed also report a remarkable degree of autonomy. About half say they decide what to do and how to do it, and another third say they and someone else decide about equally. Only about one employed person in six says that someone else decides what they do and how they do it.

In terms of autonomy, the great majority of the employed in the survey could hardly be considered wage slaves. This does not mean we should be complacent about the 17 percent or 18 percent given little or no autonomy in their paid work. Few of us would accept that amount of outright slavery, or indentured servitude, or debt peonage. Overall, though, this is

not the picture of a society in which the mass of paid workers toil in submission to the will of others.

Creativity Basics

With regard to autonomy, we can begin to question Aristotle's *seemingly* logical view that one cannot be both free and obliged to earn a living. What of Adam Smith's view of work as toil and trouble, or Marx's view of employment as an oppressive severing of design and effort, or of Dupré and Gagnier's belief that "the majority of people in contemporary societies do not do the kinds of work that could be a source of self-fulfillment?" Does the limitation of autonomy in paid employment imply a corresponding limitation of creativity?

The survey asked four questions about the necessity and opportunity for creativity in one's paid work or other main daily activities. The large majority of both employed and nonemployed report enjoyable and engaging work or daily activities, but here the employed have the edge. Both the employed and nonemployed usually agree with the statements, but the employed agree more often and more strongly.

Item 1: "My work (or daily activity) gives me a chance to do things I enjoy." Among the employed, 90 percent agreed, with 35 percent in the "strongly" category. Among the nonemployed, 90 percent also agreed, but only 28 percent strongly.

Item 2: "My work gives me a chance to develop and to learn new things." Among the employed, 87 percent agreed, 36 percent "strongly." Among the nonemployed, 80 percent agreed, only 21 percent strongly.

Item 3: "In my work I have to figure out how to solve problems." Of the employed, 91 percent agreed, 51 percent strongly. For the nonemployed, 85 percent agreed, only 21 percent strongly.

A fourth item asked about routine. Among the employed, half said they do different things, another fourth said they do the same things in different ways, and only a fourth said they do the same things in the same ways. Among the nonemployed, a similar fraction reported doing different things: 45 percent. The big difference was in the fraction doing the same things in the same ways: nearly 40 percent of the nonemployed, compared to 25 percent of the employed.

Clearly, these results do not support the notion that the majority of Americans have paid work or other main daily activities that give little scope for self-expression and self-development. On the contrary, a large majority report doing different things or the same things in different ways. Successively larger majorities see themselves as developing and learning new things, figuring out how to solve problems, and doing things they enjoy. No more than one in four sees their work or daily activity as stultifying and unchallenging—among the employed no more than one in five.

The Optimum Autonomy

Paid employment, in modern America, typically does not require submitting to the will of others, stifling self-expression, or capping personal development. Instead, it typically requires exchange or partnership with others. In trade for less than total autonomy, the individual gets a greater opportunity for creative work that more than compensates.

The relationship of creativity to autonomy suggests the importance of social exchange and partnership. Creativity has a hill-shaped parabolic relationship to autonomy, as illustrated in Figure 1. Creativity increases with more autonomy up to a point. Beyond that point, creativity decreases approaching complete autonomy. In the codes, the autonomy and

creativity values both can run from lows of -2 to highs of $+2$, but actual values rarely fall at -1 or less. Zero represents the balance point. For autonomy, 0 means you and others deciding about equally. For creativity it means not clearly agreeing or disagreeing with the statements.

Creativity has a parabolic relationship to autonomy among both the employed and nonemployed, but with distinct optimums and maximums. For the employed, the amount of autonomy that maximizes their creativity essentially equals their mean level of autonomy. For the employed, the average autonomy is 0.79, and the optimum autonomy is 0.75, a difference that is not statistically significant (see Table 1 for details). Both values lie considerably above the balance point of you and others deciding about equally, but somewhat further below you deciding entirely yourself.

The nonemployed also show a parabolic relationship, within a higher and narrower range of values. Their optimum autonomy is higher than for the employed, but considerably below their average level of autonomy—about six-tenths of a standard deviation below. This suggests that, on average, the nonemployed might have considerably more creative daily activities if they sacrificed a fair amount of autonomy, bringing it down from their average of 1.67 toward their optimum of 1.34 (see Table 1 for details).

Optimizing the level of autonomy among the nonemployed would, by definition, maximize the expected creativity of their main daily activities. However, those activities would remain considerably less creative than the work of employed persons. The creativity predicted at optimum levels of autonomy greatly favors the employed, as illustrated in Figure 1. For employed males with 12 years of education, the maximum expected creativity is 1.60. That is a little past midway between agreeing and strongly agreeing with the statements about work creativity. For nonemployed males with 12 years of education the maximum expected creativity of daily activities is 1.00—agreeing, but not strongly.

The Sense of Control, Psychological Distress, and Physical Health

Correlations in the sense of control, psychological distress, and physical health provide an indication of creative work's vital importance to humans. The results support the idea that humans express themselves, develop themselves, and discover themselves through physical or mental effort or activity directed toward the production or accomplishment of something. Apparently, productive self-expression acts as an elemental need in humans. Its suppression, frustration, or neglect apparently undermines well-being.

Figure 2 shows a structural equation model with latent factors representing autonomy and creativity as inputs and the sense of control, psychological distress, and physical health as outcomes. The regression of each outcome on autonomy and creativity adjusts for the other two by way of residual correlations. The figure shows the standardized coefficients. (Table 2 gives the metric coefficients, t values, and p values.) The creativity coefficients consistently exceed the corresponding autonomy coefficients. Autonomy has its largest standardized (and unstandardized) net association with the sense of control. Even there the creativity coefficient is 2.6 times larger (3.3 for the metric ratios). The distress ratio is 7.8 (8.7 metric) and the health ratio is 4.4 (5.5 metric). Whichever one values most—a sense of control over your own life, freedom from psychological distress, or physical health—the creativity of one's work or other main activity is more critical than the autonomy of it.

Education and the Trade-offs to Employment

It might seem that the paid work available to the poorly educated provides less varied, enjoyable, interesting, and challenging activity than they can find outside of employment through unpaid activities. The results do not support that idea. Paid employment gives

people at all levels of education more of a chance for creative self-expression. The paid work of the poorly educated is less creative than that of the well educated, and the loss of autonomy with employment is greater for the poorly educated, but the gain in creativity from employment is as great.

On balance, the poorly educated give up more autonomy to get the increment in creative work associated with paid employment. As a result, the indirect effects of employment on the sense of control, psychological distress, and physical health tend to cancel for the poorly educated. They lose via lower autonomy some of what they gain via greater creativity. At the high school degree level, the two indirect effects more or less balance out. For example, at 12 years of education, the estimated indirect effect (metric) on sense of control through autonomy is $-.075$, compared to $.089$ through creativity. Similarly, the values are $.048$ and $-.088$ for distress and they are $-.074$ and $.098$ for health. The direct effects of employment more than make up for the losses mediated by low autonomy. The estimated total effects (metric) of employment at 12 years of education are $.127$ for the sense of control ($t = 3.874$), $-.167$ for distress ($t = -4.133$), and $.245$ for health ($t = 5.444$). To put these values in perspective, the estimated total effect of employment on health at 12 years of education equals the direct effect of being 10 years younger.

The lower a person's education, the more they appear to benefit from employment. All three outcomes show significant interactions between employment and education (row 3 of Table 2). The estimated direct effects of employment vanish around the college degree to master's degree level. The estimated cross-over points are at 15.6, 17.1, and 18.9 years of education for the sense of control, psychological distress, and physical health, respectively (details in rows 1, 3, and 13 of Table 2). The *lower* a person's education, the further below those cross-over points, the *more beneficial* the estimated direct effects of employment.

In human terms—a sense of control, emotional well-being, and physical health—employment is not less valuable to the poorly educated. They simply pay more in lost autonomy to meet a greater need for employment. This is an instance of resource substitution (Ross and Mirowsky 2006, 2011). The highly educated can meet their needs for a sense of control, emotional well-being, and physical health whether employed or not. The poorly educated lack the alternative resources to make that possible. As a result, the poorly educated depend on employment more.

Discussion

So, that is work in America at the end of the twentieth century: experienced by workers themselves as largely autonomous and creative, promoting and sustaining a sense of control, emotional well-being, and physical health. The large majority of Americans describe their work as more-or-less autonomous, interesting, and challenging, although too many still report work that is constrained, tedious, and barren. The employed sacrifice autonomy but gain creativity compared to the nonemployed. The lower the level of education, the more autonomy sacrificed through paid employment, but the creativity gained remains the same. Creativity is maximized at an intermediate level of autonomy. Creativity is more important than autonomy to the sense of control over one's own life, emotional well-being, and physical health. The lower the level of education, the larger the increments in sense of control, emotional well-being, and physical health associated with employment.

Apparently, Americans express themselves, develop themselves, and discover themselves through physical or mental effort or activity directed toward the production or accomplishment of something. Productive self-expression may act as an elemental need in humans, with its suppression, frustration, or neglect undermining mental and physical health.

Questions Remain

These findings raise three questions for future research. First, are the observations about employment, autonomy, and creativity in America true in other countries with advanced economies but different cultures? Are they true in Japan, Korea, Taiwan, Sweden, Canada, Great Britain, Germany, France?

In Western culture, viewing paid work as a means and theater of productive self-expression, as a mutually beneficial alliance and partnership, is up against a 2,300-year-old philosophical tradition. Perhaps every culture is of two minds on the subject. It was the Frenchman Voltaire (2011) who said, “Work spares us from three evils: boredom, vice, and need.” More recently, the French Algerian Albert Camus (2011) noted, “Without work, all life goes rotten. But when work is soulless,” he added, “life stifles and dies.” That certainly conforms with the research results.

The second question is about trends. Are we moving toward ever more creative work? The long-term trends toward higher levels of education suggest that we may be. Better educated workers may demand more creative work, and employers may be more willing to give them the resources for it. In the short run, though, what are the effects of the recent recession? The results suggest that the newly unemployed may pay an additional human cost not tallied in the economic accounts: a decline in creative activity. What about those who manage to stay employed? Have employers taken the recession as an opportunity to cut back on autonomy and opportunities for creative work? Maybe. Maybe not. In the United States, worker productivity has been increasing at a higher than previous rate (U.S. Bureau of Labor Statistics 2010a, 2010b). How was that achieved? A squeeze on autonomy? Or an unleashing of creativity?

The third and final question is this: How does creative work promote well-being and health? What are the biological mechanisms? We have the usual suspects—the H-P-A axis, the fight or flight mechanism, learned helplessness, health behaviors—the well-known mechanisms relating stress to emotional and physical health (Mirowsky and Ross 2007). However, the biology linking them to creative work may include paths that are far more distinctively human. The human prefrontal cortex apparently controls planning, the holding and sorting of information while performing a task, the regulation of current behavior with respect to future consequences, evaluation of conflicting information or values, prediction of outcomes, and similar “executive functions” (Miller and Cohen 2001). It also may be a center of self-awareness, including self-concept, social comparison, and self-relevant feedback (Morin 2004). Does creative work promote the physical fitness of the prefrontal cortex? And if it does, how does that promote a sense of control, emotional well-being, and health more broadly?

Conclusion

In the end, research leads me to agree with the “Ode to Joy” of Schiller and Beethoven on one point: A creative will exists in humans—an energy seeking to become action. A seemingly insubstantial spirit within us needs to discover itself through design and implementation, through physical or mental effort or activity directed toward the production or accomplishment of something. George Bernard Shaw (2011) said, “The harder I work, the more I live.” Those who cannot say the same suffer a great loss.

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References

- American Heritage Dictionary. Work. 2011. Retrieved January 9, 2011 (<http://education.yahoo.com/reference/dictionary/entry/work>)
- Arbuckle, James L. AMOS 16 User's Guide. Spring House, PA: AMOS Development Corporation; 2006.
- Aristotle. Laura Moncur's Motivational Quotations: #25828. 2011a. Retrieved January 9, 2011 (<http://www.quotationspage.com/quote/25828.html>)
- Aristotle. Politics, Book 7, Part IX. 2011b. Retrieved January 9, 2011 (<http://classics.mit.edu/Aristotle/politics.7.seven.html>)
- Aristotle. Politics, Book 8, Part II. 2011c. Retrieved January 9, 2011 (<http://classics.mit.edu/Aristotle/politics.8.eight.html>)
- Bird, Chloe E.; Ross, Catherine E. Houseworkers and Paid Workers: Qualities of the Work and Effects on Personal Control. *Journal of Marriage and the Family*. 1993; 55:913–25.
- Camus, Albert. Without Work, All Life Goes Rotten. 2011. Retrieved January 9, 2011 (http://thinkexist.com/quotation/without_work-all_life_goes_rotten-but_when_work/328552.html)
- de Botton, Alain. Alain de Botton on the Pleasures and Sorrows of Work. 2011. Retrieved January 9, 2011 (<http://www.amazon.com/Pleasures-Sorrows-Work-Alain-Botton/dp/037542444X>)
- Dupré, John; Gagnier, Regenia. A Brief History of Work. *Journal of Economic Issues*. 1996; 30:553–59.
- Fenwick, Rudy; Tausig, Mark. The Macroeconomic Context of Job Stress. *Journal of Health and Social Behavior*. 1994; 35:266–82. [PubMed: 7983338]
- Karasek, Robert A.; Theorell, Tores. Healthy Work, Stress, Productivity, and the Reconstruction of Working Life. New York: Basic Books; 1990.
- Kochanek, Kenneth A.; Hudson, Bettie L. Advanced Report of Final Mortality Statistics, 1992. *Monthly Vital Statistics Report*. 1995; 43:1–13.
- Kohn, Melvin; Schooler, Carmi. Job Conditions and Personality: A Longitudinal Assessment of their Reciprocal Effects. *American Journal of Sociology*. 1982; 87:1257–286.
- Kohn ML, Naoi A, Schoenbach C, Schooler C, Slomczynski KM. Position in the Class Structure and Psychological Functioning in the United States, Japan, and Poland. *American Journal of Sociology*. 1990; 95:964–1008.
- Lennon, Mary Clare. Women, Work, and Well-Being: The Importance of Work Conditions. *Journal of Health and Social Behavior*. 1994; 35:235–47. [PubMed: 7983336]
- Lerner, Daniel J.; Levine, Sol; Malspeis, Sue; D'Agostino, Ralph B. Job Strain and Health-related Quality of Life in a National Sample. *American Journal of Public Health*. 1994; 84:1580–585. [PubMed: 7943474]
- Marx, Karl. Economic and Philosophical Manuscripts. In: Bottomore, TR., editor. *Karl Marx: Early Writings*. New York: McGraw-Hill; 1964. [1884]
- Merton, Robert K. Bureaucratic Structure and Personality. In: Etzioni, A., editor. *A Sociological Reader on Complex Organizations*. 2. New York: Holt, Rinehart and Winston; 1961. p. 47–59.
- Miller, Earl K.; Cohen, Jonathan D. An Integrative Theory of Prefrontal Cortex Function. *Annual Review of Neuroscience*. 2001; 24:167–202.
- Mirowsky, John; Ross, Catherine E. Eliminating Defense and Agreement Bias from Measures of the Sense of Control: A 2 × 2 Index. *Social Psychology Quarterly*. 1991; 54:127–45.
- Mirowsky, John; Ross, Catherine E. Creative Work and Health. *Journal of Health and Social Behavior*. 2007; 48:385–403. [PubMed: 18198686]

- Morin, Alain. A Neurocognitive and Socioecological Model of Self-Awareness. *Genetic, Social, and General Psychology Monographs*. 2004; 130:197–222.
- Muthén, Linda K.; Muthén, Bengt O. *Mplus User's Guide*. 4. Los Angeles, CA: Muthén and Muthén; 2007.
- Nagi, Saad Z. An Epidemiology of Disability among Adults in the United States. *Milbank Memorial Fund Quarterly*. 1976; 54:439–68.
- Reynolds, John R. The Effects of Industrial Employment Conditions on Job-Related Distress. *Journal of Health and Social Behavior*. 1997; 38:105–116. [PubMed: 9212533]
- Ross, Catherine E. Occupations, Jobs and the Sense of Control. *Sociological Focus*. 2000; 33:409–20.
- Ross, Catherine E.; Drentea, Patricia. Consequences of Retirement Activities for Distress and the Sense of Personal Control. *Journal of Health and Social Behavior*. 1998; 39:317–34. [PubMed: 9919854]
- Ross, Catherine E.; Mirowsky, John. Households, Employment, and the Sense of Control. *Social Psychology Quarterly*. 1992; 55:217–35.
- Ross, Catherine E.; Mirowsky, John. Sex Differences in the Effect of Education on Depression: Resource Multiplication or Resource Substitution? *Social Science & Medicine*. 2006; 63:1400–413. [PubMed: 16644077]
- Ross, Catherine E.; Mirowsky, John. The Interaction of Personal and Parental Education on Health. *Social Science and Medicine*. 2011; 72:591–99. [PubMed: 21227556]
- Ross, Catherine E.; Wright, Marylyn P. Women's Work, Men's Work and the Sense of Control. *Work and Occupations*. 1998; 25:33–55.
- Seeman, Melvin; Seeman, AZ.; Budros, A. Powerlessness, Work, & Community: A Longitudinal Study of Alienation and Alcohol Use. *Journal of Health and Social Behavior*. 1988; 29:185–98. [PubMed: 3241062]
- Shaw, George Bernard. The Harder I Work the More I Live. 2011. Retrieved January 9, 2011 (http://thin-kexist.com/quotation/the_harder_i_work_the_more_i_live/147721.html)
- Smith, Adam. On the Real and Nominal Price of Commodities. An Inquiry into the Nature and Causes of the Wealth of Nations, Book I. 1776; 5 Retrieved January 9, 2011 (<http://www.econlib.org/cgi-bin/searchbooks.pl?searchtype=BookSearchPara&pgct=1&sortby=R&searchfield=F&id=10&query=toil+and+trouble&x=0&y=0&andor=and>).
- Theorell, Tores. Working Conditions and Health. In: Berkman, LF.; Kawachi, I., editors. *Social Epidemiology*. New York: Oxford University Press; 2000. p. 95-117.
- U.S. Bureau of Labor Statistics. Preliminary Multifactor Productivity Trends—2009. 2010a. Retrieved January 9, 2011 (<http://www.bls.gov/news.release/pdf/prod3.pdf>)
- U.S. Bureau of Labor Statistics. Productivity and Costs, Third Quarter 2010. 2010b. Revised. Retrieved January 9, 2011 (<http://www.bls.gov/news.release/prod2.nr0.htm>)
- Verbrugge, Lois. From Sneezes to Adieu: Stages of Health for American Men and Women. *Social Science and Medicine*. 1986; 22:1195–212. [PubMed: 3749951]
- Voltaire, François-Marie Arouet. Work Spares Us from Three Evils. 2011. Retrieved January 9, 2011 (http://thinkexist.com/quotation/work_spares_us_from_three_evils-boredom-vice-and/195593.html)
- Weber, Max. *The Protestant Ethic and the Spirit of Capitalism: The Relationships between Religion and the Economic and Social Life in Modern Culture*. New York: Charles Scribner's Sons; [1904–1905] 1958.
- Wickrama KAS, Lorenz Frederick O, Conger Rand D, Matthews Lisa, Elder Glen H. Linking Occupational Conditions to Physical Health through Marital, Social, and Intrapersonal Processes. *Journal of Health and Social Behavior*. 1997; 38:363–75. [PubMed: 9425780]

Figure 1. Creativity of work or other main daily activities as a parabolic function of autonomy, separately for the employed and nonemployed
Note: See Table 1 for the coefficients and Figure 2 for the measurement model.

Figure 2.

Structural equation model relating the autonomy and creativity of work or other main daily activities to employment and education as inputs and the sense of control, psychological distress, and physical health as outcomes

Note: Standardized coefficients. See Table 2 for metric coefficients and *t* values.

Structural Equation Model^a Testing a Parabolic Association of the Creativity of Work or Other Main Daily Activities to Their Autonomy, for the Whole Sample ($N = 2,580$), the Employed ($N = 1,320$), and the Nonemployed ($N = 1,260$) (Metric Coefficients with t values)

Table 1

Dependent	Whole sample		Employed		Not employed	
	Autonomy	Creativity	Autonomy	Creativity	Autonomy	Creativity
Independent						
1 Autonomy	1.366	****	1.309	****	3.264	****
t value	20.796		22.318		7.380	
2 Autonomy ²	-0.758	****	-0.878	****	-1.215	****
t value	-23.091		-26.885		-7.114	
3 Optimum ^b autonomy	0.901		0.745		1.343	
4 (Age - 45) ÷ 10	0.125	****	0.101	****	0.013	****
t value	9.306		5.023		1.115	
5 (Age - 45) ² ÷ 100	0.012	*	0.002		-0.007	
t value	1.778		0.148		-1.312	
6 Female	0.100	****	-0.143	****	0.145	****
t value	2.602		-2.613		4.115	
7 Education (Years - 12)	0.023	****	0.073	****	-0.009	****
t value	2.835		5.778		-1.313	
8 Intercept	0.989	****	0.688	****	1.601	****
t value	21.284		11.822		24.624	
9 Mean	1.218		0.786		1.667	
10 Standard deviation	0.924		0.999		0.556	

^a Autonomy and creativity are latent factors. See Figure 2 for the measurement model.

^b Defined as the level of autonomy associated with the maximum predicted creativity.

* $p < .10$.

** $p < .05$.

*** $p < .01$.

 $p < .001$

Table 2

Structural Equation Model^a Relating the Autonomy and Creativity of Work or Other Main Daily Activities to Employment and Education and to the Sense of Control, Distress, and Health (Metric Coefficients, with *t* values)

Dependent	Autonomy	Creativity	Sense of control	Distress	Health
Independent					
1 Employed	-1.026 *** -19.219	0.413 ***** 7.807	0.096 *** 2.928	-0.127 ***** 3.128	0.221 ***** 4.911
2 Education (Years - 12) <i>t</i> value	-0.001 -0.154	0.060 ***** 6.993	0.223 10.261	-0.031 ***** -5.628	0.070 ***** 9.248
3 Employed × Education <i>t</i> value	0.105 ***** 7.778	-0.001 -0.076	-0.001 -0.027 *****	0.126 3.193	-0.032 *** 3.023
4 Autonomy Factor <i>t</i> value		0.123 ***** 4.403	0.055 ***** 3.302	-0.036 -1.183	0.043 * 1.906
5 Creativity Factor <i>t</i> value			0.181 ***** 9.412	-0.312 ***** -10.095	0.238 ***** 9.033
6 (Age - 45) ÷ 10 <i>t</i> value	0.083 ***** 6.186	0.020 1.582	-0.040 ***** -5.140	-0.239 -7.904	-0.562 -16.439
7 (Age - 45) ² ÷ 100 <i>t</i> value	-0.016 ***** -2.699	-0.001 -0.253	-0.009 ** 2.534	0.002 0.631	0.020 0.857
8 Female <i>t</i> value	0.026 0.717	-0.055 -1.588	-0.037 -2.184	0.099 ***** 4.616	-0.014 -0.478
9 Intercept <i>t</i> value	1.633 ***** 32.038	0.530 ***** 8.118	0.516 ***** 12.902	1.393 ***** 32.399	0.712 ***** 12.661
10 <i>R</i> ²	0.318	0.133	0.375	0.186	0.536
11 Mean	1.218	0.936	0.755	1.107	0.982
12 Standard deviation	0.910	0.737	0.424	0.504	0.806
13 <i>E_c</i> ^b	21.8	...	15.6	17.1	18.9

^a *N* = 2,580, U.S. 1995 ASOC Survey, see Figure 1 for fit statistics and measurement model.

^b *E_c* is the level of education at which the model predicts no difference in the outcome between the employed and the nonemployed. Predicted differences in outcomes favor the employed more the further education is below *E_c*.

* $p < .10$.
** $p < .05$.
*** $p < .01$.
**** $p < .001$.