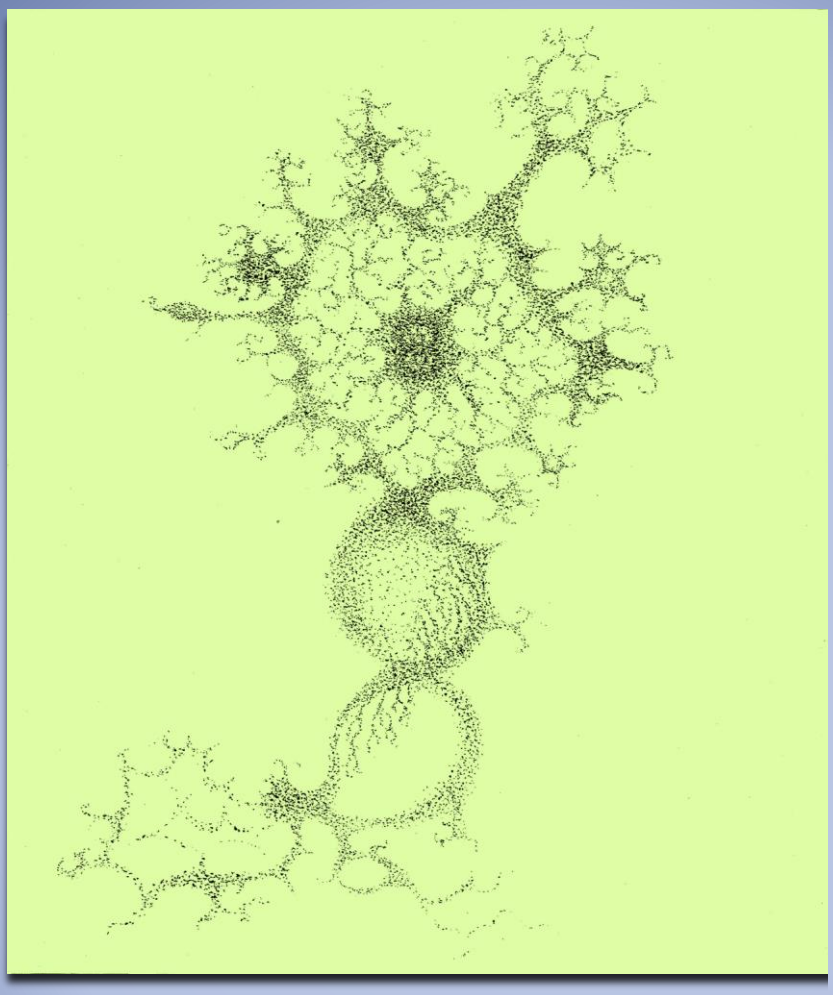


ZOMBIES, E.T.'s & The SUPER ENTITY

A Selection of Most Stimulating Articles

By M. A. Ricciardi

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NOTES TO THE READER:

The selected articles included in this book were written by Michael A. Ricciardi between January of 2010 and March 2014. They have been selected for their 'evergreen' (continuing relevance) subject matter. All have been republished here from the web log *planetsave.com* (a member of the Important Media blog network) with permission from Important Media.

Wherever some article content/material was *derived* from other published sources (journal papers, news releases, or other web articles), this has been noted and/or linked-to at the conclusion of each piece.

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Most of the selected articles and essays were selected according to the disciplinary theme of 'Social Psychology' (or *socio*-psychology) with the exceptions of "New Simulation Based On Popular Game Shows How Warfare 'Built' Early Civilizations" (which is interdisciplinary and most likely falls under the human history and/or cultural anthropology headings), and, "Network Analysis Reveals 'Super Entity' of Global Corporate Control" which, while certainly possessing a socio-psych component, falls mainly under the heading of Economics. Likewise, several other articles included here detail experiments with wider relevance to Economics, and economic policy/theory, in general. The featured article/essay 'The Zombies Among Us' covers wider territory, including sociology, psychology, economics, network theory and even healthcare.

Oh, and there is one "outlier" piece on E.T.'s. that is decidedly of a more existential nature.

Additionally, the content of the article "Social Isolation Disrupts Brain's 'White Matter' Formation - Key to Brain Plasticity, MS and Mood Disorders" mainly concerns findings in Neurobiology, although this is described in the context of social behavior (or its opposite: *isolation*).

Several articles conclude with an Author's Comment or Afterthought.

Articles vary in length from under 700 words to more than 3000 words. I hope you find that all are worth the read. Please enjoy.

--Michael A. Ricciardi

How Poverty Impairs Mental Functioning and Promotes Risky Decision-Making

Researchers who study poverty have long-recognized that those who live in poverty frequently behave in less capable ways and engage in risky behaviors that both produce additional problems and also exacerbate their poverty status.

Previous research on people living in long-term poverty (Shah *et al*, 2012, others) have shown fairly conclusively that lack of financial means forces poor decision-making -- such as choosing to purchase cheaper, less healthy foods, or, to forgo purchasing a necessary medication due to cost, thus increasing poor health. This much seems clear, if not self-evident.

But new research by a team of psychologists and economists from Harvard, Princeton, and the University of British Columbia, has found that it is not simply the lack of money that forces poor people to make "poor" decisions, rather, that poverty itself depletes *cognitive* resources, and specifically, one resource in particular: *cognitive control*.

According to the researchers -- who combined results from two complimentary studies -- poverty "directly impedes cognitive functioning".

Self-Control - A Limited Resource

The new findings by Mani *et al* buttress what's known as the *limited resource model of self-control* according to which being poor depletes a person's ability to control future decisions and actions because of the constant "trade-offs" and self-control demands that poverty imposes on the individual.

Previous research (Pocheptsova *et al*, 2009, Wang *et al,* 2010) indicates that decision-making that demands self-control (e.g., resisting desires) leads to future decisions that favor impulsive, "intuitive", choices over more reasoned ones. And, the effect is cumulative.

Poor people, due to their lack of financial resources, tend to face more of such trade-offs, more frequently, with each such trade-off or sacrifice further depleting his or her capacity for self-control. Put simply: the more people have to exercise self-control, the *worse they become at exercising self-control*. Interestingly, this behavior is similar to those experiencing chronic pain (Solberg Nes *et al*, 2010).

"Being Poor means coping not just with a shortfall of money, but also with a concurrent shortfall of cognitive resources." (Mani *et a*l, *Science*, 30 August, 2013)

The typical result of this nearly continuous overtaxing of self-control is that poor people, who unavoidably must overcome urges that affluent people indulge routinely, are more likely to overspend, over-eat, and engage in other risky behaviors.

Most of us readily recognize that money is a limited resource (for the majority of us), but we tend not to view self-control as a *limited* resource. We tend to see self-control as a "character", or even *moral*, trait, more or less; certain social biases can lead us to reflexively blame the poor for their own "bad" choices and inability to constrain their risky behaviors.

This newest research readdresses this notion by placing the issue of poverty and behavior in the context of cognitive *capacity* and investigates whether the state of poverty itself impairs cognitive performance by over-taxing this capacity.

The Experiments - Finances and Farmers

Mani and colleagues endeavored to test this *cognitive constraint hypothesis* by designing two separate but mutually supporting studies: one being a laboratory study, and the other, a "field" study.

In the first, they "induced thoughts about finances" in the study subjects. The subject pool (shoppers at a New Jersey mall) was selected to be representative of the American socio-economic spectrum -- ranging in annual income from 20,000.00 dollars per year to over 70,000.00 per year*. Participants were presented with hypothetical problems (e.g., their car is in need of serious repairs, costing *x* $) and then asked how each would go about deciding what to do (having first been presented with the choices: pay in full, take out a loan, or forgo the repairs). Subjects were randomly assigned scenarios with either a "hard" condition (more costly) or "easy" condition (less costly). These scenarios and choices were designed to trigger thoughts ("concerns") about the subject's own personal finances.

This scenario phase of the study was immediately followed by two types of cognition tests: a *spatial compatibility* test which tests "cognitive control" (the ability to guide thoughts and actions in keeping with internal goals, thus "self-control") as a function of speed and accuracy in response to opposing stimuli. The second cognitive test administered was what's known as *Raven's Progressive Matrices*, which is a standard component of IQ tests used to measure "fluid intelligence" (which tests one's ability to think in novel situations regardless of acquired knowledge).

Results showed that in the "easy" condition (e.g., where car repair would cost only 150.00), high and low-income earners ("rich and poor") performed similarly on both tests. However, in the "hard" condition (with repairs costing 1500.00), those who were poor performed significantly worse on both the Raven's and cognitive control tests. Overall, the poor performed "reliably worse" than the rich (note: the researchers conducted 4 such lab experiments, with subsequent ones designed to eliminate "math anxiety" and reduce cognitive test "load" on the subjects, with similar results).

In all four constituent experiments, the team noted a "robust interaction between income and condition."

In the second study (the "field" study), the research team examined the cognitive functioning of farmers over the course of a planting/harvesting cycle. The study subjects here were 464 small-scale, sugarcane farmers from 54 villages in two districts of Tamil Nadu, India. Farmers had to make at least 60% of their income from sugarcane farming. They were interviewed twice over a four-month period -- before and after harvest.



Rice paddies, Tamil Nadu, India

The data confirmed that the farmers "faced greater financial pressure pre- as compared to post harvest". Specifically, they pawned items more frequently and took out almost twice as many loans pre-harvest time as during post-harvest time. The farmers were also more likely to answer "yes" to the question: "Did you have trouble coping with ordinary bills in the last fifteen days?" pre-harvest than they did post-harvest.

In the cognitive testing phase, the researchers substituted the spatial compatibility test with a numeric version of the conventional Stroop task test (deemed appropriate for low literacy populations) which quantifies both speed and accuracy. On both the Stroop and Raven's tests, the farmers performed better post-harvest than pre-harvest, with the average number of errors being lower post-harvest. Additionally, regression analyses confirmed pre/post-harvest differences on both tests, and, the farmers' "perceived intensity" of how financially constrained they are (based on the "last 15 days" question) was negatively correlated with their performance on the two cognitive tests. In other words, the less financially constrained they perceived themselves to be, the better they did on the cognition tests.

This second study was controlled for "calendar effects", i.e., differences in planting and harvesting due to festivals or weather, which can create false correlations, as well as nutritional/food consumption factors, pre- and post-harvest (caloric intake by the farmers was actually slightly less post-harvest).

Further, the researchers considered the role of physiological "stress" in their findings -- controlling for three stress measures (heart rate, diastolic and systolic blood pressure) -- but found that this biological definition of stress (based on these three biomarkers) was insufficient to explain the low cognitive performance found. Rather, the researchers

found that "attentional capture" was the best explanation for the observed mechanism. In this theory, it is held that poverty captures attention while simultaneously triggering intrusive thoughts and reducing cognitive resources.

In light of their findings, the researchers suggest that future educational and agricultural service programs in these regions be carefully timed to the appropriate phase of the harvest cycle, when there is greater cognitive capacity post-harvest (note: research by Doflo *et al*, 2011, show that farmers made higher-return investments immediately following harvest time, compared to later in the season).

In seeking to demonstrate a "causal relationship between actual income and cognitive function *in situ*", the researchers assess their two studies thus:

"The laboratory study has a great deal of internal validity and illustrates our proposed mechanism, whereas the field study boosts the external validity of the laboratory study."

What is Poverty? - Impacts and Provocative Conclusions

In seeking to show how money concerns "tax the cognitive system", Mani *et al* define poverty as "the gap between one's needs and the resource necessary to fulfill them." While acknowledging that such needs can be subjective, the team notes that their dual studies encompass low-income people in both the developed and developing worlds, and further encompasses people experiencing "transitory income shocks" such as from unemployment or medical emergencies.

Additional past research points to a cumulative, long-term effect of poverty on cognition (Karelis, 2007, Shonkoff, Deborah, {2000}) while childhood poverty has been correlated with hindered brain development and a reduction in cognitive capacity amongst adults who experienced childhood poverty (Evans *et al*, 2009).

This recent research by Mani *et al* demonstrates a mechanism of cognitive impairment *not* derived from childhood poverty, but rather, from "an immediate cognitive load caused by financial concerns." In their August 2013 *Science* paper, the researchers assert that "evoking financial concerns has an impact comparable with losing a full night's sleep" and further assert that "the effects we observed correspond to − *13* IQ points."

In the words of the authors:

"The findings are not about poor people...but about any people who find themselves poor."

The full elucidation and long-term impact of this "cognitive mechanism" awaits future study, but the implications of this new research by Mani *et al* for individuals and societies -- and *social policy* – would seem to be significant and far-reaching.

* It is interesting that Mani *et al* chose this annual income figure of 70 K to represent the "rich' or high-income group, as it is quite close to the income estimate by Kahneman and Deaton (2010) for the cut-off point for improvement in emotional well-being and "life-evaluation" ratings. See the article: *Money Does "Buy" Happiness, Up To A Point.*

Source material for this article came from the paper 'Poverty Impedes Cognitive Function' (*Science*, 30 August, 2013); authors: Anandi Mani, Sendhil Mullainathan, Eldar Shafir, and Jiaying Zhao

Additional material came from the *Science* 'Perspective' article (same edition) 'The Poor's Poor Mental Power' by Kathleen D. Vohs

Author's Note (added Dec. 24, 2013): As to the question of what might help *restore* a person's cognitive resources, recent research on the "power of prayer" by Friese and Wanke (published in the *Journal of Experimental Social Psychology*) showed that those who prayed before being given an emotional suppressive task followed by the Stroop test performed better on the test than those who were told to just think about any subject they chose. Follow up analysis showed that people who prayed interpreted the act of praying as a *social interaction with god*, and it is social interaction, the researchers posit, that gives us the "cognitive resources to avoid temptation." This result held for the religious and non-religious alike. Previous research (Ybarra, Burnstein, Winkielman {2008}) supports this theoretical interpretation; even brief social interactions improve cognitive functioning.

Top photo: ("It's a Hard Life'); credit: wrangler via shutterstock.com

Bottom Photo (Rice paddies): Lush green paddy fields between Aralvaimozhy and Nagercoil, Tamil Nadu, India (credit: w:user:PlaneMad /CC-By-SA 3.0)

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Money Does "Buy" Happiness, Up to A Point

According to a report that analyzed 450,000 responses from 151 nations, personal income is indeed related strongly to two categories of subjective experience: "life evaluation" and "emotional well-being" -- but only up to an annual income of 75,

000.00. Beyond that level, subjective reporting of emotional well-being and "positive affect" do not change.

Researchers sought to quantify the relationship between income, life satisfaction and emotional well-being. Data used in this analysis was collected through the Gallup Healthways Well-Being Index which surveyed 1,000 persons per day from 2008 to 2009.

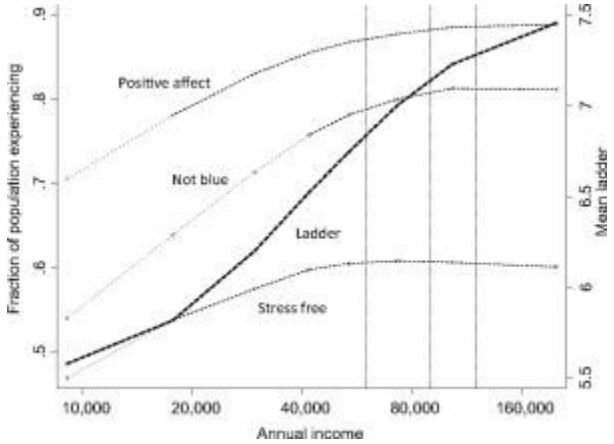
The analysis found that "income and education are more closely related to life evaluation, but health, care giving, loneliness, and smoking are relatively stronger predictors of daily emotions."

The category of life evaluation refers to the thoughts one has about one's life when we think about it. The typical question (from the survey) is: "How satisfied are you with your life these days?" This assessment was made using what is known as the *Cantril's Self-Anchoring Scale* which asks respondent to rate his/her current life on a ladder scale ranging from ′0′ to ′10′ (where ′0′ is the worst possible life, and ′10′ is the best possible life).

Emotional well-being refers to the emotional quality of one's daily experience of life -- the intensity and frequency of emotions like joy, sadness, stress, anger and affection. Measures of "positive affect" such as frequent smiling and laughter, and reporting of happiness or enjoyment were averaged together to derive a score. Measures of worry and sadness -- the "blue effect" -- were also included in this average.

Measures of stress and anger were measured separately (see graph).

Emotional well-being is assessed by questions about the presence of these various emotions in the individual's *recent* experience (i.e., yesterday).



Positive affect, blue affect, stress, and life evaluation in relation to household income. Positive affect is the average of the fractions of the population reporting happiness, smiling, and enjoyment. "Not blue" is 1 minus the average of the fractions of the population reporting worry and sadness. "Stress free" is the fraction of the population who did not report stress for the previous day. These three

hedonic measures are marked on the left-hand scale. The ladder is the average reported number on a scale of 0–10, marked on the right-hand scale.

According to authors Daniel Kahneman and Angus Deaton:

> "The aims of our analysis of the GHWBI were to examine possible differences between the correlates of emotional well-being and of life evaluation, focusing in particular on the relationship between these measures and household income."

The researchers also note that in regards to a change in income, it is not the *absolute* change that matters, but the *percentage* change in income that more strongly correlates ("logs") with a higher life evaluation measure.

As an example of this logarithmic difference, the authors observe:

> "In the context of income, a $100 raise does not have the same significance for a financial services executive as for an individual earning the minimum wage, but a doubling of their respective incomes might have a similar impact on both. The *logarithmic transformation* reveals an important regularity of judgment that risks being masked when a dollar scale is used."

Some general findings of the analysis:

85% of respondents reported much positive affect *each day*, while sadness and worry were reported by 24%.

39% reported experiencing stress each day.

Overall, the U.S. ranked 9th out of 150 countries in its reporting of daily positive affect (trailing just behind Scandinavian countries, Canada, The Netherlands, Switzerland, and New Zealand). We also ranked 5th in happiness and 10th in enjoyment.

However, we ranked much lower on measurements of worry (89th from best), sadness (69th from best), and anger (75th).

U.S. respondent Americans report very high levels of stress (fifth among 151 countries).

For more detailed information, check out the published paper **High income improves evaluation of life but not emotional well-being**.

URL: (http://www.pnas.org/content/107/38/16489.full .

Graph: Kahneman, Deaton (paper figures, pnas.org)

The Zombies Among Us - Exploring The Resurgent Popularity of Zombies In Modern Culture



There *are* real zombies, or "sleep walkers", in this world...the voodoo victims of hoodoo drug-induced slavery, normally restricted to the tribal cultures of Western Africa and the West Indies (following the introduction of African slaves to the New World)...and, presumably, their numbers are diminishing due to the great social disapproval of the practice and its fading into globalism-induced superstitious obscurity.

But I am here referring to the resurgent popularity of the post-modern, *literary* and *cinematic* versions of Zombies; the relentless, flesh-eating, "undead", once-human

monsters that seem to be popping up nearly everywhere in recent years: in an assortment of "gore-fest" zombie flicks, *Thriller* tribute parades and flash mobs ("zombie walks"), a semi-satirical television series (*Walking Dead*), and even a hipster car insurance commercial.

While cinephiles will note that the "modern" notion of a zombie entered western culture via the landmark 1921 film *Das Cabinet des Dr. Caligari* (directed by Robert Wiene), most current and recent depictions of zombies stem from George A. Romano's 1968 film *The Night of the Living Dead* (itself inspired by Richard Matheson's 1954 novel *I Am Legend*).

But what might explain this resurgent zombie (mob-like) popularity? Is there some deeper meaning or cultural significance to be found? Something so pervasive could hardly be coincidental, or accidental, or the result merely of imitation (although "good box office" *is* a motive for imitation). This article will explore some of the various intellectual interpretations and theories (socio-psychological, cultural, economic and political-organizational) of the zombie phenomenon in the hope of shedding light on its true role in modern society.

Zombies & Societal Anxiety - Its Always The Zombie Apocalypse in the Movies

As zombie films are a genre of horror, one expects there to be a general sense of fear surrounding their depiction. But there is something more to zombie films than simply offering audiences a fright fest; there is a pervasive *anxiety* -- a "rising social tension" -- a feeling that, at any moment, we might all succumb to The Zombie Apocalypse. This tension and anxiety surround the use and depiction of zombies in popular culture -- even those depictions that approach the subject with humor.

This general view seems correct enough to be a fair starting point for an exploration of zombie imagery and cultural subject matter. And, of course, underlying this anxiety is also a pervasive (if projected) feeling of *alienation*. Indeed, both anxiety and alienation are mutually reinforced through "zombiism", the emergence of a robotic, destructive, impersonal, and *collective* behavior that threatens to take over our individual lives and/or the world. There are, of course, many sources of anxiety and "social tension" and my research on this topic has uncovered a surprising variety of analyses of the zombie monster motif in popular culture.

The Zombies Among Us ~ A Critique of Consumer Capitalism

In the economic analysis, at least some of this alienation derives directly from the status of the modern worker, critically dubbed *homo economicus (*Schor, 1992), and his/her economic role: that of a ceaseless, unquestioning, consumer of goods and services, and whose most distinguishing trait is that he/she -- like the zombie's quest for fresh flesh -- *can never be satiated.* There is an inexorable emptiness within this new species of human. In his 2012, neo-Marxist essay/critique (1) on human resource development,

Robin Redmon Wright is quick to assert (quoting Brookfield, 2005): "Workers become the Zombies of global capitalism which is 'best served by large populations that equate living with consuming.'" Wright elaborates on this as follows:

> **"Just as Zombie s are driven by the disgusting need to consume increasing amounts of human flesh — a need never satiated — workers are driven to consume the offspring of their own creativity and are mesmerized by our consumer society into craving more and more products of labor in order to support and sustain an inequitable system..."**

In attempting to critique modern human resource development and also explain the upward spike in zombie films in recent years, Wright presents his thematic rationale:

> **"...workers are feeling the effects of a culture consumed by a mounting need to consume for survival. The undercurrents of dissatisfaction with the excesses of unregulated capitalism will surely be reflected in popular culture. And for people living in a consumer culture — where they must consume their own humanity (the products of their day-to -day existence) in order to survive — it's a virtual no-brainer that we should consider the Zombies Among Us."**

Wright's critique (the "no-brainer" pun aside), not to forget, is largely of the role that modern adult education and human resource development (HRD) plays in serving up individuals to the narrow needs of corporate capitalism. Rather than encouraging people towards "a lifelong practice of creative fulfillment, helping others and contributing to humanity", said education and HRD "actually reduce learning to an act of survival and a *means to more consumption.*" [emphasis added]

In the face of an "unprecedented material change in much of the Western world and especially in the US", Wright posits the resurgence of *free market ideology** -- something he sees as happening *en force* just in the past decade or so -- as the "reason for the observed increase in adult horror fans."

Zombies, as we all know, are likewise insatiable in their lust for *brains,* something their robot-like behavior demands -- not to *gain* intelligence or awareness (the *ti-bon anj* that the *bokor* keeps in a special bottle) but to consume it, making the victims of said ingestion now equally mindless and hungry for more.

In George Romero's at times perversely humorous *Dawn of the Dead* -- the late-coming 1984 follow-up to *Living Dead* -- the government has been taken over or destroyed by zombies, leaving isolated pockets of human society to fend for themselves against the onslaught. The main scene of the film occurs in a shopping mall which an ever-amassing horde of zombies invades in one orgiastic flesh-feast. There, Wright observes, "consumers are literally consumed by mindless former humans."

Such horror flicks are not truly nihilistic; there is a social morality tale lurking beneath most zombie films. Wright sharply but succinctly summarizes the narrative arch of this and other zombie films (albeit through his Marxist filter):

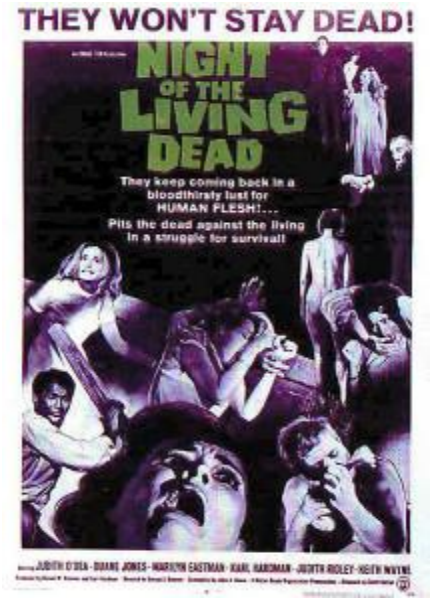
> **"Those individuals [not yet infected by zombies] inevitably realize that they cannot survive unless they work together as communities of practice. Therefore, civilization and society is redefined and will now be determined by those survivors — the workers who fight will prevail and the flesh-eating automatons who stay the course will rot with their desire to consume."**
>
> * It is interesting to note that the term *zombie banks* is being used more frequently in recent years (by economists), referring to banks that are "dead" in terms of liquidity/solvency, but are still functioning, to some degree, on the surface.

Zombies As An Embodiment of Our Fear of Displaced Persons and the Undocumented

As salient as the forgoing analysis may have been, it is not the only interpretation of the zombie phenomenon.

Many have noted an increase in zombie films during more conservative times and the often concomitant, anti-immigrant sentiment. I should note that I include here the plethora of independent (low budget) zombie films that regularly appear at annual zombie film festivals -- many of which are made by children of immigrants or foreign students from non-Western nations. The idea that there is a connection between zombies and a fear or distrust of immigrants and displaced persons entering "our" Western societies is worthwhile to contemplate.

In observing the increase in media representations of zombies in the first decade of the 21st Century, Jon Stratton (2), in a 2011 article for the journal *Somatechnics*, argues that there is a connection "between the new preoccupation with zombies and anxieties over the apparent threat posed by those without rights [or documentation?] attempting to enter Western countries."



Stratton's analysis goes a bit deeper, and gets decidedly darker; utilizing Giorgio Agamben's conception of “bare life” (i.e., a life deprived of the legal protections of the State; the term in Latin: *homo sacer**), he draws a link between this bare life and the Muselmann -- the Jewish concentration camp prisoner reduced to a state of "walking dead."

Stratton's subsequent analysis is more round-about; he sees the *bare life* as essential to the operation of a modern State (a provocative idea, still) and then uses this theorem to connect the Muselmann with the Zombie, and from there, he connects zombies with displaced persons, whom Stratton also equates with "asylum seekers."

To be sure, beginning in the 20th Century -- and continuing into the 21st Century -- Western nations have seen an unprecedented in-flux of displaced persons, foreign workers, refugees, etc. One may note that many governments (including the US) have clamped down on this in-flux, with the present administration deporting more undocumented workers than nearly any in history. The 'displaced person' is a person without legal rights, generally, and because of this limbo-like status, can be treated in ways that we would not tolerate in "civil" society. Do zombie films, on some level, reflect this (mostly irrational) fear, and bigotry, and thus also the moral indifference as to how they are dealt with?

The popularity of *zombiism* in films may likely continue and may represent the exaggerated (anxiety-generated) compulsion to continuously "do battle" with such hordes, before they “take over” Western society with their strange and foreign practices. And, with this slowing but unabated influx of displaced persons, Stratton asserts -- just as Agamben claimed that the *werewolf* was the archetypal monster of the pre-modern age -- that the "zombie is the characterizing monster of the modern age".

* *Homo sacer* (“sacred” or “accursed” man) - Under the early Roman legal system, it was permissible *for anyone* to kill such a person (found guilty of committing certain crimes), but *not* ritualistically, i.e., under a state religious ceremony or rite. It seems that the standard anti-zombie protocol (kill them by any means), in Agamben's view, stems from this Roman 'bare life' legal concept.

Zombies as a Uniquely North American Form for Our Post-Apocalyptic Anxiety

Film scholar Kyle Bishop, writing in the *Journal of Popular Culture* and others (3) notes that Romero's depiction of zombies was actually a *chimera* of three "monsters": the vampire, the zombie of Haitian lore, and the cannibal. He also observes that classic zombie narratives share certain key features, chief of which is **“**a post-apocalyptic backdrop” that is characterized by “the collapse of societal infrastructures, the resurgence of survivalist fantasies, and the fear of other surviving humans."

Bishop claims two reasons for the popularity of zombies or zombiism in modern (American) culture. The first reason that he offers is that the zombie is a "uniquely North American construction" unlike the Gothic monsters (vampires, werewolves, and ‘Frankenstein-like monsters’) of European folklore. This claim for New World uniqueness no doubt derives from the common apprehension of zombiism as a product of Haitian *vodon* traditions, in the first place, and the appropriation of this "ex-human" monster in popular Western books and films, in the second place.

This first claim is not entirely justified, in that, as noted earlier, zombies originated in the "witchcraft" traditions of various Western African cultures (ranging from Ghana to Nigeria) where its practice was socially abhorred and punishable no less than murder. And, the word *zombi* is certainly African.

However, Bishop qualifies this claim through referring to the zombie as "the only canonical *movie* monster to originate in the New World" verses a monster existing in folk tradition alone. That said, it was not clear to me why or how this uniqueness factor would drive the current popularity of this cinematic fare.

Bishop's second reason is more compelling and clarifying: the sudden horror of 9/11 and the unstoppable destruction and deprivation caused by Hurricane Katrina created the perfect, post-apocalyptic conditions to make the zombie “a logical ‘form’ for anxieties related to such moments.” This would seem a plausible, if highly generalized, line of reasoning.

However, Americans have experienced numerous disasters and have been fed a steady stream of disaster movies over the past five decades or so -- with no comparable spike observed in zombie depictions. But perhaps Bishop is indicating a peculiar mass media effect or role at play in certain types of disasters – an effect that magnifies the mass exodus of people from the scene of a disaster – that naturally lends itself to a fear of

traumatized masses fleeing (or “invading”?)…their normal means of survival stripped from them, no longer assured.

So, although I cannot agree completely with Bishop's zombie theory of post-apocalyptic utility, he does, importantly, emphasize the idea that zombies are a cultural "form" into which, or upon which, we may displace (or project) our anxieties or fears.

Zombies as Distributed Social Systems & A Threat to Traditional Social Structures

A 2011 essay entitled *Protocol Z: The distributed social organization of zombies* (4) by S. Jankowski offers an intriguing and truly contemporary analysis centering on the barely decade old emergence of various networked groups and internet-enabled collective "intelligences" which present themselves none-the-less as singular, *mono-mental*, entities.

In zombies, Jankowski sees both "a vessel for fears surrounding the distributed network crowd" and also (in terms of the film sub-genre itself) a *tool: "*zombies present us with a fictional space in which to experiment with unfamiliar organizational patterns for which we are only just becoming aware."

Jankowski's analysis draws upon many literary sources, chief of which is Robert Kirkman’s graphic novel (turned cable TV) series *The Walking Dead* (2003 –), in which Jankowski notes "a tension between the hierarchical structure of the family and the 'flat' organization of zombie crowds." In his analysis of the zombie phenomenon, Jankowski utilizes Manuel Castells' conception of "the network society*"* (and the "anxieties that surround it"), described in the 2004 book of the same name. He also draws upon classic modern non-fiction like Canetti's *Crowds and Power* (1960/1973).

Jankowski notes Bishop's theories, and although he disagrees with them, he none-the-less concurs that historical eras have their collective fears/anxieties and their uniquely identifying monsters (e.g., the 19th Century fear of misguided science in Dr. Frankenstein, the nuclear fears of the 1950's/'60's that gave us *Godzilla*), and, that this modern era seems to have a thing for zombies.

However, Jankowski takes a more phenomenological view of zombies and offers both functional (psychological) and instructional models of Zombie culture and social organization. Jankowski recognizes and describes the curiously regular behavioral traits of zombies: they are unidentifiable and anonymous, they can congregate spontaneously without any apparent guidance, they can spontaneously encircle and swarm their victims, and, they can quickly coordinate into a unit with a single purpose (i.e., eat living human flesh).

In short, film *zombies* exist in a network and/or exhibit networked behavior. This seemingly mindless yet socially disruptive behavior is none-the-less efficiently directed toward its goal (as defined by that network).

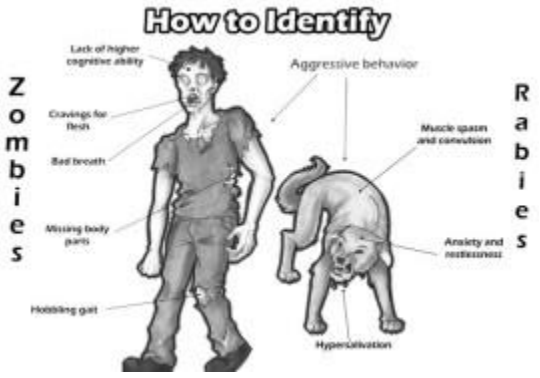
And while the depiction of Zombies in cinema may reflect our anxieties and some social "tension" (though I tend to think that "network anxiety" is over-played, or exaggerated, after all, people also flocked to see *The Social Network),* the experience of it -- the genre itself -- actually provides a social benefit. In Jankowski's words:

> **"...zombies have provided a fictional landscape in which to theorize how social organization is controlled in a network society. Such spaces allow for a certain amount of leeway in the variability that one encounters. Thus, I advocate for the popularity of the zombie sub-genre. These grotesque playgrounds of the imagination are the field notes of a minor science of society. If one is to take the conceptual leap of applying these protocols to the notion of distributed networks that actually exist, be they memes, viral videos, or any other future cultural product, we may learn something vital about what it means to belong to the network society."**

Zombies as Instructional Tool For Public Health Messaging

And, finally, whether or not one buys into all this high-faloutin' intellectualism on zombies, or even likes the zombie film genre, there is yet another social function or role for zombies: public information and awareness. In a May 2013 article for *Emerging Infectious Diseases* (5), public health researchers from the CDC (Nasiruddin *et a*l) made their case for Zombie-themed Pubic Health messaging. Citing various works including the acclaimed novel *World War Z: An Oral History of the Zombie War* by Max Brooks, and its commentary on the efficacy of government, the team of public health experts assert:

> **"These popular and varied manifestations of zombies elucidate the potential for a comprehensive dissemination of knowledge, from identifying traits indicating infection to explaining the significance of public health infrastructure. Zombies are a unique medium that allow for the audience's suspension of disbelief and for intellectual engagement."**



Cleverly, the researchers exploit the popularity of zombies to get the word out about infectious diseases like *rabies*. Rabies symptoms are remarkably similar to the

overt behavior exhibited by classic cinematic zombies. Nasiruddin *et a*l make an astute connection between the two ailments to present their public health case.

> **"...zombiism remains an existence in which the victim has been stripped of any higher consciousness or agency. The reimagining of zombiism as a virulent, incurable disease makes it an effective analogy for understanding of and interest in other infectious diseases."**

As depicted in the CDC cartoon diagram (above), similarities between Zombiism and Rabies are intriguing and the researchers cheekily offer their engaging comparison:

> **"Both ailments are primarily transmitted through biting"**,

and,

> **"Rabies causes difficulty swallowing because drinking causes spasms of the voice box; zombies largely lack the ability to produce any sound other than a deep groan, although they have been capable of speaking the word 'brains' in classic zombie cinema".**

This behavioral similarity may not be entirely coincidental, or merely fortuitous; our fear of zombies may reflect a generalized but very real and primal fear of disease *contagion* and the resulting social quarantining. The public health experts behind this campaign may have unconsciously recognized this ancient fear, but not wishing to ignite public panic, chose a more instructional route.

Indeed, in the final paragraph of the report, this "cover" slips a bit, and the authors make a direct connection between a "zombie apocalypse" and mass contagion – while also facetiously suggesting a zombie *ethos*:

> **"If a zombie apocalypse were to occur, surviving humans might not have the capacity for mass vaccination. The sole option may be to kill the undead for human survival; however, the ethics of destroying something that was once human might be called into question."**

Recognizing The Form

So then, in wrapping up this exploration of zombies in modern culture, I will note that each of the theories presented here seems to hold some degree of validity and each offers some real insight into the social phenomenon, though each seems also incomplete, or perhaps, *inexact*. It would seem that zombies are essentially *fuzzy* things -- reflecting the emergent "fuzziness" of the modern mindset -- and will defy any precise, logical assessment.

Zombies, in the end, may be a type of embodied Rorschach test for whatever mass social anxieties and tensions may be present, or operating, at the time...And also, no less

significantly, zombies are a convenient and attention-grabbing tool for understanding novel social structures and teaching ourselves some of Life's scarier health lessons...And, *remember to always wash your hands afterwards*.

Top Photo: Wikipedia.org (Zombies in Moscow); teujene ; cc-by 2.0

Citations:

(1) Wright, R. R. (2010), 'Vampires and Zombies as Critical Public Pedagogy: Using Horror for Critical Adult Education and HRD Instruction', University of Texas at San Antonio

(2) Stratton, J. (2011), 'The Trouble with Zombies: Bare Life, *Muselmänner* and Displaced People" ; *Somatechnics*. Volume 1, Page 188-208 DOI 10.3366/soma.2011.0013, ISSN 2044-0138, Available Online March 2011 .

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> Note: All Kyle Bishop quotes are from the paper by S. Jankowski (cited below); the listed citations (above) were taken from the same paper.

(4) Jankowski, S. (2011). 'Protocol Z: The distributed social organization of zombies'; *Critical Themes* 2011. April 15–16. The New School.

(5) 'Zombies—A Pop Culture Resource for Public Health Awareness' (Melissa Nasiruddin, Monique Halabi, Alexander Dao, Kyle Chen, and Brandon Brown); *Emerging Infectious Diseases (CDC)*, Volume 19, Number 5—May 2013 [Author affiliation: University of California, Irvine, California, USA]

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Author: M. Ricciardi

Word Count: 3,424

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New Simulation Based On Popular Game Shows How Warfare 'Built' Early Civilizations



In our modern era, we can find ample evidence of the role of war in destroying societies, but historically, the opposite appears to be the case — war was instrumental in organizing early civilizations. Supporting evidence for this comes from an intriguing new model based upon the popular computer game *Civilisation* in which competing tribes may evolve into organized societies and even world-ruling empires.

Spanning the historical epoch from 1500 BCE to 1500 CE, the "civilization simulator" was designed by Peter Turchin of the University of Connecticut and his colleagues. The

model was able to predict when and where complex human societies would likely emerge with 65% accuracy — based upon comparison to the known historical record.

Anthropological research observes that early nomadic human groups evolved into more organized societies with the establishment of strong social behaviors — principal of which is *trust* — built upon social institutions of government, justice, religion, and education. But how did these institutions get their start?

There have been earlier theorists who have posited the role of warfare in the evolution of human societies. But the Turchin model is the first of its kind to utilize historical data on this scale to investigate the role of warfare in the development of human civilizations.

In endeavoring to build their "cultural evolutionary model" of the rise of human civilization, the researchers first asked two key questions:

How did human societies evolve from small groups, integrated by face-to-face cooperation, to huge anonymous societies of today, typically organized as states?

Why is there so much variation in the ability of different human populations to construct viable states?

Modeling Early Human Societies and the Role of Warfare

To build such a model, the researchers divide the world — specifically the Eurasian continent — up into squares (similar to the game) and define each according to the type of terrain (e.g., how mountainous) and whether or not it was farmed. The farmed squares where accorded an "independent" group of people, some organized, other not. Those squares closest to the Eurasian Steppe were "seeded" with military "technologies" such as the domestication of horses — a critical advance in warfare — and spread out from these squares as the model/simulation was run.

As noted earlier, the simulation predicted where and when large empires would emerge with 65% accuracy. To verify the role of military technologies in this emergence, the researchers removed that variable from the simulation with the result that accurate prediction fell to just 16%.

Other factors were also tested. For example, removing the impact of land elevation reduced the predictive accuracy to 48%. This suggest that geography, though important, was not as important a factor as warfare in stabilizing larger societies.

Why Warfare?

According to Turchin et al, the reason for this is because warfare imposed a "selective pressure" on these early groups, forcing them to either evolve into organized societies, or be destroyed.

They also note than many social practices, like paying taxes, while providing "little benefit" to individuals (note: this claim is arguable), they none-the-less helped establish social coordination and thus stronger societies. in this way these societies out-competed

That's because, although many measures were of little benefit to the individual – paying taxes, for example – they helped forge more coordinated, and therefore stronger societies that were able to out-compete less organized groups.

Quoting from the paper abstract:

'Our results support theories that emphasize the role of institutions in state-building and suggest a possible explanation why a long history of statehood is positively correlated with political stability, institutional quality, and income per capita.'

Next up for the researchers: a simulation of the rise of complex societies in the Americas (e.g., the Maya, Aztecs, Toltecs, and Anastasi) and expanding the Eurasian model beyond the 16th century.

Expanding such models to include more modern societies will be challenging, as other factors besides warfare and conquest come into play; the spread of social institutions and culture is a more complex matter, involving mass media, large migrations (e.g., the emigration of Europeans to America in the early 20th century) and the assorted forces of "globalization" (commerce, travel, education, technology)

Of course, all this being said and demonstrated, one might ask: what factor(s) promoted the existence and spread of warfare itself? This may prove a more complex question to answer or to model, but there are a few other historical researchers whom have found a strong connection between human conflict (and "social upheavals") and climate change (perhaps due to climate induced scarcity of resources).

The research and modeling results by Turchin *et al* were published in the *Proceedings of the National Academy of Sciences*, under the title 'War, space, and the evolution of Old World complex societies'

Some additional source material for this post came from the *New Scientist* article 'Real-world *Civilisation* game shows impact of war' by Hal Hodson

Top Image: Women and priests retrieve the dead bodies of Swabian soldiers just outside the city gates of Constance after the battle of Schwaderloh (April 11, 1499). *(Luzerner Schilling)*

Original URL; **http://planetsave.com/2013/09/29/new-simulation-based-on-popular-game-shows-how-warfare-built-early-civilizations/**

Date of publication (on-line): September 29, 2013

Word count: 798

Stress and Existential Anxiety Increase 'Belief in Science', New Study Finds

The old adage "there are no atheists in fox holes" may be true for the more religiously inclined, but much less so for the more rational or scientific-minded amongst us.

A recent study by psychologist at University of Oxford, in the UK, finds that a certain "faith" in the explanatory power of Science increases when subjects were experiencing stress or anxiety. They surmise that this "belief in science" serves the same purpose — amongst non-religious persons — as the belief in god (or a higher power) does for religious folks.

Previous studies had found that religious belief serves as a coping mechanism for persons experiencing stress and anxiety (Inzlicht et al, 2012, Norenzayan & Hansen, 2006), and served to "compensate for lack of control" (Kay et al, 2009). The Oxford researchers decided to follow up on this with new studies to determine if this effect was specific to religious belief, or, if it was in fact a more general mechanism, that is, whether the coping power was an effect of belief *itself*.

Dr Miguel Farias, the study's lead researcher in the Department of Experimental Psychology at Oxford University, explains:

"We found that being in a more stressful or anxiety-inducing situation increased participants' 'belief in science'. This belief in science we looked at says nothing of the legitimacy of science itself. Rather we were interested in the values individuals hold about science." [quote source: Oxford University press release]

Regarding these values, Dr. Farias elaborated further:

"While most people accept science as a reliable source of knowledge about the world, some may hold science as a superior method for gathering knowledge, the only way to explain the world, or as having some unique and fundamental value in itself. This is a view of science that some atheists endorse."

The Experiments – Rowing and Writing

To more accurately gauge a person's belief in science, the researchers first devised a 'belief' scale comprised of ten statements asking participants how much they "agreed or disagreed". Example statements included:

- 'Science tells us everything there is to know about what reality consists of.'
- 'All the tasks human beings face are soluble by science.'
- 'The scientific method is the only reliable path to knowledge.'

Next, the researchers focused on a cohort of subjects who would be experiencing real-life stress: a group of 100 rowers, 52 of whom were soon to be engaged in a rowing competition (known as a *regatta*) — presumed to be at a higher stress level — and the remaining 48 were about to do a normal practice session (presumed to be less stressed).

Results of this first experiment: those who were about to compete in the regatta (who reported feeling more stress) returned scores showing a greater belief in science than those doing the normal training session. The differences were considered "statistically significant". Both groups of rowers reported a lower degree of "religiosity" (i.e., their belief in science was *negatively correlated* with religiosity, or religious faith).

In the second experiment, 60 subjects were randomly assigned to one of two groups. One group was told to think about their own death ("primed with mortality") and then write down any feelings aroused by this existential contemplation (this strategy to induce 'existential anxiety' has been used in other studies). The members of the second group were asked to write about experiences with dental pain. The results: study participants tasked with writing about their own deaths scored higher of the belief in science scale.

Summing It All Up

The researchers had initially predicted that "stress and existential anxiety" would result in greater belief in science. Results corroborated this prediction. The general findings of this research:

- Athletes about to compete (vs. training) reported greater belief in science.
- Mortality salience increased belief in science but not in scientific determinism.
- Secular individuals benefit from believing in science.

The researchers concluded that the study's results were consistent with the notion that belief in science increases when secular individuals are placed in stressful (or "threatening") situations. They further suggest that this belief may aid non-religious people in dealing with adverse conditions.

However, Farias also acknowledged the study's limitations; it showed only that stress or anxiety increased belief in science. it did not examine whether affirming this belief would subsequently reduce the *experience* of stress or anxiety.

The researchers (Miguel Farias, Anna-Kaisa Newheiser, Guy Kahane, Zoe de Toledo) report their findings in the *Journal of Experimental Social Psychology* under the title: 'Scientific faith: Belief in science increases in the face of stress and anxiety'

The research paper abstract:

Growing evidence indicates that religious belief helps individuals to cope with stress and anxiety. But is this effect specific to supernatural beliefs, or is it a more general function of belief – including belief in science? We developed a measure of belief in science and conducted two experiments in which we manipulated stress and existential anxiety. In Experiment 1, we assessed rowers about to compete (high-stress condition) and rowers at a training session (low-stress condition). As predicted, rowers in the high-stress group reported greater belief in science. In Experiment 2, participants primed with mortality (vs. participants in a control condition) reported greater belief in science. In both experiments, belief in science was negatively correlated with religiosity. Thus, some secular individuals may use science as a form of "faith" that helps them to deal with stressful and anxiety-provoking situations.

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Word count: 886

Our Physical Surroundings And Postures Can Make Us Dishonest, Newest Study Confirms

An expansive office space or desk, or even a large car interior, alters our posture, making us feel more powerful…and *this tends to make us dishonest…*that's according to new research to be published in a forthcoming issue of the journal *Psychological Science*.

The study, entitled 'The Ergonomics of Dishonesty' (Yap *et al*), draws upon four earlier studies showing how our physical surroundings, posture, and consequent feelings of power combine to promote less than honest behaviors.

In the course of living our daily lives we tend not to pay much attention to small alterations in our bodily posture, but these small changes can have a very large impact on our thoughts, feeling and choices. Our physical surroundings actually "force" subtle changes in posture upon us which in turn influence how we feel and act — in many test cases, dishonestly.

Lead researcher Andy Yap explains:

"In everyday working and living environments, our body postures are incidentally expanded and contracted by our surroundings — by the seats in our cars, the furniture in and around workspaces, even the hallways in our offices — and these environments directly influence the propensity of dishonest behavior in our everyday lives,"

A previous study showed that "expansive postures" can promote feelings of personal power and that this empowered state can lead to dishonest behavior. In this newest study, researcher built upon these and other earlier findings to show that nonverbal postures forced upon people by their environments can influence our choices and behaviors to make us less honest.

One earlier laboratory study manipulated the expansiveness of the laboratory work spaces and then tested to see whether subjects' "incidentally" expanded postures (shaped by one's physical surroundings) led to more dishonest behaviors (determined by a test following the manipulations). Another experiment used automobiles as the test lab, putting subjects in cars with a more expansive driver's seat and were tested to see if they were then more likely to "hit and run" while playing a video game that "incentivized" players to drive fast.

Each of these studies found a strong correlation between alterations in postures (induced by alterations in the size of the physical setting) and subsequent dishonest behaviors — like cheating and stealing — sometimes even leading to actual illegal behavior.

In a final study to see if these findings applied in the real world, an observational field study was conducted to determine if automobile driver's seat size could predict the likelihood of (more) parking violations on the streets of New York city. Sure enough, results showed that cars with larger driver's seats were more likely to be illegally parked.

"This is a real concern. Our research shows that office managers should pay attention to the ergonomics of their work spaces. The results suggest that these physical spaces have tangible and real-world impact on our behaviors," said Yap.

The study did not attempt to explain *why* this should be so, that is, what *cognitive mechanism(s)* translate our sense of expansive personal space into feelings of power and why this can make us dishonest.

Speculatively, this correlation may turn out to be a vestige of some primal *territorial* instinct wherein the more space we secure for ourselves, the more secure and powerful we become (and the greater our "biological advantage", in the evolutionary sense), and, feeling so, we may come to feel that social norms and rules no longer apply to us. Thus, we cheat.

We await more in-depth studies.

About the Researcher: Andy Yap is a former PhD student at Columbia Business School and currently a visiting professor at MIT Sloan School of Management; the research is co-authored by Abbie Wazlawek, a PhD student at Columbia Business School; Brian Lucas, a PhD student at Kellogg School of Management; Amy Cuddy, a professor at Harvard Business School; and Dana Carney, a professor at the University of California, Berkeley.

Original URL for this article: http://planetsave.com/2013/06/27/our-physical-surroundings-and-postures-can-make-us-dishonest-newest-study-confirms/

Word count: 633

Extreme Political Views Caused By The 'Illusion of Understanding'

Have you ever tried to engage in a balanced discussion or debate over, say, macro-economics or maybe foreign policy — subjects that are complex and contingent upon many factors — and found yourself frustrated in your attempts by an extreme/unyielding ideological viewpoint?

Well, the next time you're confronted with an extreme (and typically over-simplified) political viewpoint, you might try asking that person to explain their viewpoint, that is, ask them to detail how they think a certain policy or law actually works. You might just find that their extreme view will shift to one that is more moderate and balanced.

This shift from an extreme view to a less extreme one is due to the 'illusion of understanding', according to new research published in the journal *Psychological Science.*

How to Explain the Rise and Ubiquity of Polarized Politics?

The generally perceived increase in political polarization in the US in recent years, prompted a team of psychological scientists (Fernbach *et al*) at the Leeds School of Business, University of Colorado, Boulder, to explore some of the possible factors contributing to this increase in extreme/polarizing politics.

"We wanted to know how it's possible that people can maintain such strong positions on issues that are so complex — such as macroeconomics, health care, foreign relations — and yet seem to be so ill-informed about those issues," said Philip Fernbach, lead researcher on the study.

Previous research on voter viewpoints seems to indicate that this 'illusion of understanding' is based upon people possessing a misapprehension (the 'illusion') of their own knowledge of a subject, that is, they tend to believe that their understanding is greater or better than it actually is*.

Apparently, when the extreme view-holding person is tasked with explaining the "nuts and bolts" of how a given policy or law works, this forces them to confront the fact that they do not know as much about the policy as they had previously thought, forcing them to moderate or soften their former extreme view.

Welcome news, to be sure, but not that surprising, really.

* This misapprehension about one's own knowledge seems very similar to the 'Dunning-Kruger Effect' in which a person's incompetence prevents them from recognizing their incompetence.

The Experiments – Explaining Your View Points

In the first of two experiments conducted by the research team, participants were given an on-line survey to assess *how well they understood* six different policies (e.g., raising the retirement age for Social Security qualifying, or implementing a national 'flat tax' or merit-based pay for teachers). Following this self-rating, the participants were randomly given two of the policies to actually explain and then they were asked to rate themselves again based upon how well they thought they understood the issues.

Data from these self-assessments corroborated the earlier prediction; in general, people reported lower understanding on all six policies after being tasked with explaining them. Further, results showed that as participants' understanding of a policy *de*creased, their *uncertainty* about a position *in*creased, and the less extreme their position became.

These results held true for "views" spanning the mainstream political spectrum — Republican, Independent, and Democrat.

What's more, the researchers found a strongly correlated behavioral effect from this shifting of viewpoints; a second experiment showed that people indeed "put their money where their mouth is" (or rather, *withhold* their money when faced with their policy ignorance) in terms of monetary donations to a given political cause. Given the opportunity to donate 'bonus' money to a politically-related organization, participants whose extreme views had shifted or "softened" after having to explain the policies were less likely to donate money to that political organization.

The Importance of Being Uncertain

The researchers feel that their findings could possibly help to keep lines of communication open amongst those locked in ideologically-driven debate or negotiations.

"This research is important because political polarization is hard to combat. There are many psychological processes that act to create greater extremism and polarization, but this is a rare case wherein asking people to attempt to explain makes them back off their extreme positions." commented Fernbach.

This study (Fernbach *et al*) would also seem to be supported by, or be related to, earlier research regarding the role that *uniformed individuals* (those showing 'weak preferences" in both human and non-human animal groups) play in "promoting democratic consensus" through preventing extreme minority viewpoints from dictating group choice (see: Couzin *et al*; 'Uninformed Individuals Promote Democratic Consensus in Animal Groups', Science, 16 Dec., 2011).

Well, maybe as long as the "uninformed individuals" have to explain themselves before they go vote.

The study paper is entitled: 'Political Extremism Is Supported by an Illusion of Understanding' and its co-authors include Todd Rogers, Harvard Kennedy School; Craig R. Fox of the University of California, Los Angeles; and Steven A. Sloman of Brown University. Source: Association for Psychological Science

*Author's Comment:

While I find this study affirming of my principles of moderation (in most things) and feel it is generally valid, the study results imply (and seem to confirm) that any given extreme political view (towards a given policy, as defined by the researchers) is generally held by someone who cannot explain accurately the policy for which the view is held. The study also seems to imply that the extreme view is the 'wrong' view (*because* it is unsupported by personal understanding; it could be unsupported, but, by chance, be correct), and further seems to imply that, therefore, the moderated/softened view is more "correct", or closer to the truth.

Psychological studies such as these are always problematic.

Some source material for this post (including quotes) came from the *escience news* article: 'Extreme political attitudes may stem from an illusion of understanding' - published: Monday, April 29, 2013 – 12:36 in the Psychology & Sociology section.

Original URL for this article: http://planetsave.com/2013/05/20/extreme-political-views-caused-by-the-illusion-of-understanding/

Word count: 951

Would Contact by E.T.'s Save Us or Destroy Us? - Paper Causes Web Stir



War of the Worlds, 1927 reprint in *Amazing Stories*.

A recent "scenario analysis" paper — originally thought to be from NASA — considers various scenarios centering on contact with Extra-Terrestrial beings and how said ETs might view us, help us, or deal with us.

A certain paper entitled 'Would Contact with Extraterrestrials Benefit or Harm Humanity? A Scenario Analysis' has been making the rounds and causing a bit of a hullabaloo this past week. The "controversy" stems from an erroneous attribution of the

paper to NASA (originally by the UK's *Guardian*, now retracted), when in fact, the paper — a "thought experiment" — is only co-authored by an intern at NASA's Planetary Science Division; NASA did not commission nor official "approve" of the paper.

Regardless, the paper is newsworthy for what it is willing to consider, which is the fate of humanity post first contact…or even, *without* a formal first contact (like, "Hey, we found you!" or, "We come in peace!"). By this it is meant that a first contact might be the last contact; we might be viewed as a threat to other alien civilizations.

The authors (Baum, Haqq-Misra, and Domagal-Goldman, the latter being the NASA intern) consider what an advanced alien species — monitoring us remotely — might conclude (and act upon) after detecting changes in the Earth's atmosphere. Such changes, such as a build-up of greenhouse gases, could be detected through spectral analysis of the Earth, much as human astronomers and astrophysicist make deductions about *habitable planets* based upon spectral analysis (i.e., spectral lines indicating presence of certain gases).



A composite picture of Earth at night, created with data from the Defense Meteorological Satellite Program (DMSP) Operational Linescan System (OLS). Human civilization is detectable from space.

Optimists or idealists may prefer to believe that the aliens would recognize the signs of a hothouse planet in-the-making, realize that we were in trouble, and come and save us (somehow, as in *Starman*). Pessimists may be compelled to believe the opposite: that, having so imperiled our own planet, we would then have to move out to other planets — spreading our wasteful/destructive ways as we go — and destroy us before we could do so (like we kill invasive weeds before they spread all over our nice lawns).

Quoting from the paper's abstract:

> "Contact [with Extra-Terrestrial Intelligence, ETI] could occur through a broad range of scenarios that have varying consequences for humanity. However, many discussions of this question assume that contact will follow a particular scenario that derives from the hopes and fears of the author. In this paper, we analyze a

broad range of contact scenarios in terms of whether contact with ETI would benefit or harm humanity."

Starting with discussions of the famed Fermi Paradox*, the challenge of interstellar communication, the putative advanced nature of ETIs, the motives of ETIs (selfishness, universalism), and the possible *heterogeneity* (diversity) of ETIs, the authors then proceed to consider four general ETI contact scenarios:

1] contact that is *beneficial* to humanity,

2] contact that has a *neutral* impact on us,

3] contact that is *intentionally* harmful to us,

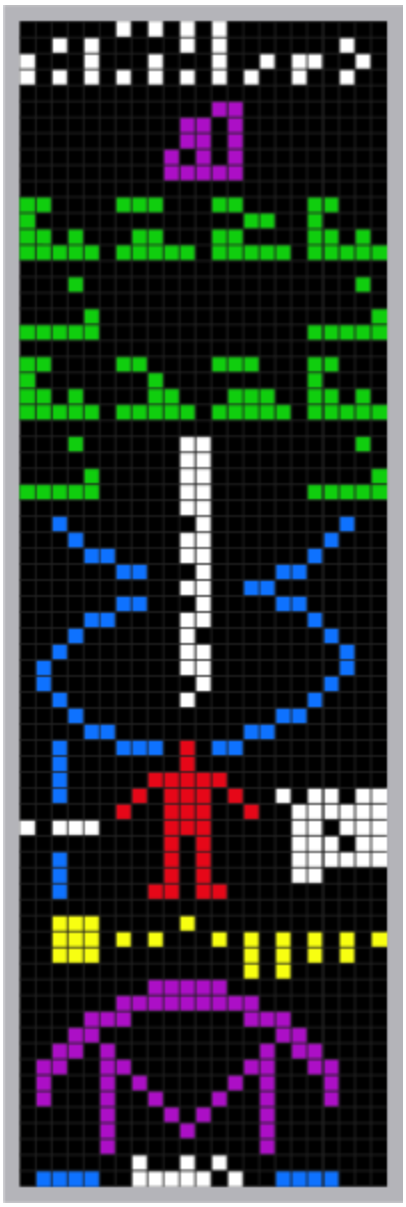
4] contact that is *unintentionally* harmful to us.

In the first scenario, "benefit" could result from simple detection (without actual contact) of an ETI as this would prove that we were not alone in the galaxy (and perhaps create a unified human identity). Additionally, there is the possibility of any given ETI being *cooperative* (in regards to our goals) or *uncooperative* (our goals may not be viewed as necessary or "good" to an ETI; we might see the error of our ways, etc.)

In the second scenario, any ETIs that exist "out there" could remain invisible to us (perhaps by choice) indefinitely, or, they may in fact be noticeable to us (and we to them), but remain "indifferent to us."

In the third scenario (the most troubling), the ETIs are of one of two kinds: *selfish* or *universalist*. In the former case, much like the Vogons in *Hitchhiker's Guide to the Galaxy*, we would either be deemed a nuisance/obstacle (selfish), and eliminated, or, be deemed a threat to others (universalist), and eliminated (or perhaps just "caged in").

Finally, in the fourth scenario (which sounds like a movie title), contact with ETIs proves hazardous — either through being a *physical* hazard (alien germs anyone?), or, perhaps an *informational* hazard (you think you're suffering from info over-load now, just wait until the ETIs download their data files into our computers!).



A graphical representation of the Arecibo message – Humanity's first attempt to use radio waves to actively communicate its existence to alien civilizations

There is also (not mentioned in the paper) the *Zoo Hypothesis* which asserts that ETIs would regard us much like conservationists here regard a biologically rich ecosystem, or rare species; the putative ETI would thus tend to keep us isolated so as to preserve/protect us from interference, or contamination, by other ETIs. It is akin to the Prime Directive espoused by the Federation on *Star Trek*.

In any event, until the day *verifiable* first contact happens, it is all so much fascinating speculation. But it is speculation that has a purpose and perhaps great value to us. Again, quoting from the abstract:

> "This type of broad analysis can help us prepare for actual contact with ETI even if the details of contact do not fully resemble any specific scenario."

Well, dear readers, what do *you* think about future contact with ETIs? I welcome your speculations and scenarios.

> *** The Fermi Paradox (or Fermi-Hart Paradox) refers to the apparent contradiction between high estimates of the probability of the existence of extraterrestrial civilizations and the lack of evidence for, or contact with, such civilizations.**

The paper 'Would Contact with Extraterrestrials Benefit or Harm Humanity? A Scenario Analysis' was published in the (Direct Science) in the June-July 2011 edition of the journal *Acta Astronautica*.

Images: (War of the Worlds illustration) Frank R. Paul; (Earthlights) NASA; (Arecibo Message) Arne Nordmann (norro) ; CC – By – SA 3.0

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Word count: 989

'I'll Never Change' - Actually, You Will (More Than You Think), New Study Shows

Life is full of decisions, many of which will impact our lives far into the future…everything from whether to apply for a mortgage and choosing where to live…to whom to marry and how many children we wish to have…all of these involve various long-term commitments.

According to a team of psychologists, these decisions are based upon one fundamental — but nearly universally wrong — assumption: *that you know the person you are going to be*, ten or more years in the future.

Teenagers are notorious for their lack of foresight in decision making (largely due to what's known as 'developmental asymmetry' in brain growth), but according to a series of new studies, older folks greatly underestimate how much they will change in the future; their predictions about their 'future selves' (from personal tastes to willingness to spend money) were often significantly underestimated.

The Experiments – Your Past and Future Self

The new research, conducted by Harvard psychologist Daniel Gilbert along with post doc Jordi Quoidbach and University of Virginia psychologist Timothy Wilson, involved a series of on-line experiments with some 19,000 participants between the ages of 18 and 68.

In the first such experiment, participants were given a personality assessment questionnaire in which they scored themselves on traits like extraversion (one's "outgoingness"), emotional stability and "openness to new experiences". They were then told to repeat the assessment but this time to answer the questions *as they thought they would have answered ten years ago*, or, *ten years in the future.*

On average, and regardless of age, people tended to believe they had changed more in the past ten years than they would in the coming ten years. This makes a certain obvious sense; our brains have memories of our personal history to compare our present self with, while picturing any 'future self' involves projecting and imagining one's life not yet lived.

Indeed, the psychologists found that this underestimation was not due to a failure of accurately remembering the past, but rather, an inability to predict the future.

Researchers found it surprising that even older, more life-experienced persons tended to underestimate how much they will change. For example, 58+ year-old participants predicted very little change in their lives in the coming decade, even while they had noted significant personal change in the previous decade.

The End of ("Personal Change") History?

The researchers termed this tendency to underestimate future personal change as "the end of history illusion" because their results suggested that people believe that the present marks the point in which they have finally stopped changing.

In follow up surveys, the researchers found that people also tend to underestimate how much their personal values — like "success" and "security" — will change in the future. This holds even for personal references like who they will consider their best friend or even their favorite band.

"What these data suggest, and what scads of other data from our lab and others suggest, is that people really aren't very good at knowing who they're going to be and hence what they're going to want a decade from now," stated Gilbert, in a *Science NOW* interview.

This innate, or unconscious, bias can have significant impact on our financial decisions.

In a last experiment, the team asked some participants how much they would pay in 2012 (the year of the experiments) to see their favorite band in 2022, while others were asked

how much they would pay to see their favorite band from 2002 play a concert in the coming week.

On average, people were willing to pay 61% more to see the future concert with their current favorite band than people who were ten years older would pay to see the past favorite band (from 2002) play in the present (here, 2012). One might suppose that middle aged folks would be wise enough to know that their current favorite band will not be the favorite band ten years from now, but instead, the researchers found that "participants substantially overpaid for a future opportunity to indulge a current preference."

Quoting from the paper abstract:

'People, it seems, regard the present as a watershed moment at which they have finally become the person they will be for the rest of their lives. This "end of history illusion" had practical consequences, leading people to overpay for future opportunities to indulge their current preferences'

Other Experts Weigh in on the Experimental Results

Other experts in the field believe that this new research reveals how a common intuition (about the self) is wrong — that people tend to believe that *they have changed more than they will change*. This is true despite that fact that people don't generally have this belief about others or the world in which they live (i.e., they accept and predict that others, and the world, will change).

But at least one other researcher has doubts about this so-called "end of history illusion". Yale University psychologist Shane Frederick, who conducted a similar (though smaller size) study in 2003, believes that people might well anticipate future changes but, not knowing *how* they would change makes them more likely to predict the *status quo*. Frederick's study found similar underestimations of future change, but, he asserts, this might be the result of people having an understandable "reluctance to predict what is unknowable."

Learning to Make Better Self Predictions

But this does not mean that people can't anticipate future change and make better informed decisions.

Previous research by Gilbert *et al* found that people make more accurate predictions about their reaction to a future event* when they know how others have reacted to it previously.

According to Gilbert:

> **"The single best way to make predictions about what you're going to want in the future isn't to imagine yourself in the future, … it's to *look at other people who are in the very future you're imagining*,"**

Author Note:

An important factor that determines, or motivates, a person's future change of values — specifically, in regards to *concern for the environment* — is reminders of one's mortality.

> * This would be a nearly universal future event, such as death of one's parents, or one's children leaving home, or having children of their own.

Some source material and quotes for this post came from the *Science NOW* article: 'Your Elusive Future Self' by Greg Miller.

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Tyranny Enabled Through Identification, Not Passive Conformity, New Analysis Shows



The idea that atrocities result from "unblinking obedience" to authority has become so ingrained in our social consciousness that we rarely ever question it.

Indeed, more recently, popular culture has adopted the phrase "Resistance is futile" – taken from *Star Trek TNG*'s 'borg' entity mantra — to encapsulate, even enshrine, our belief in how all-consuming is our capitulation to authority, and consequently, the emergence of tyranny.

Some innate — perhaps primordial — instinct for passivity and conformity in the presence of authority figures is posited as the predominant (academic) explanation for the rise of tyranny in societies. Most scholars on the subject accept that we are "programmed to obey."

But new research drawing upon evidence from the historical record and two 'classic' experiments offers a compelling argument that passive conformity is neither inevitable nor the cause of our oppression of and brutality towards our fellow humans.

Instinctive Conformity as Cause of Tyranny – Exploring The Roots

This pervasive societal belief has it roots in two 'classic' social-psychology experiments from the 1960′s and 1970′s.

In the earlier decade (1963), we have the (in)famous experiments conducted by Stanley Milgram in which he sought to reveal how the horrors of Nazi concentration camps could have happened.

In Milgram's studies, mostly male volunteers — called 'teachers' — were told to administer a memory test to subjects ('learners') and punish them — by applying increasing levels of electric shocks — when they got the answers wrong. The teachers controlled a panel of switches that administered the electric shocks — ranging from a mere 15 Volts up to 450 Volts.

Disturbingly, and with only the lab-coated, clipboard-wielding Milgram standing by, urging them on, all of the volunteers (in one trial) continued to give more intense shocks (up to 300 V) to the test subject even though they could hear his screams of pain and pleas to stop. What's more, 65% of the 'teachers' went all the way to 450 V (in the 'baseline' study).

Unbeknownst to the teachers, the test subjects ('learners') were actually confederates/actors who were cued when to react to the (fake) "electric shock".

Milgram wrote about these experiments in his book *Obedience to authority: an experimental view* (1974).

In the following decade (1973), we have the equally infamous 'Stanford Prison Experiment' conducted by Paul Zimbardo and Haney Banks (funded by the US Office of

Naval Research) in which student volunteers were randomly divided into prisoners and guards in an simulated "prison" laboratory in the basement of one of the Psychology Department building. In contrast to Milgram's study, Zimbardo and Banks wanted to observe the interactions between two groups in the *absence* of any "malevolent" authority.

The participants readily assumed their respective 'dominant' and 'submissive' roles, with the guards adopting beatings and other brutal forms of physical abuse to manage the prisoners. This abuse became so egregious that the study was terminated after just 6 days.

The researchers' conclusion was even more alarming that Milgram's: brutality was ""a 'natural' consequence of being in the uniform of a 'guard' and asserting the power inherent in that role". People do not need any specific *orders* (or the physical presence of authorities) to evolve a tyrannical culture — they conform "unthinkingly" to the *roles* prescribed by authorities.

Zimbardo writes about this experiment in his 2007 book *The Lucifer effect: how good people turn evil*.

These two classic studies seem to offer substantive proof of "the banality of evil" *; people blinded conform to their assigned roles and the instructions given to them by those in power. it is, it seems, the tragedy of human nature: we would rather be "good subjects than subject who do good."

But is that all there is to understand here? Is there another, more compelling interpretation of these studies? [article continues on next page]

Conformity Isn't Natural and It Doesn't Explain Tyranny

Revisiting these classic experiments, researchers Haslam and Reicher (2012, see citation below) offer a new analysis that sheds greater light on our tendency to conform to the will of authority.

In their analysis, the researchers challenge this consensus through empirical studies based upon Social Identity Theory. In fact, argue the researchers, their re-interpretation of the results/conclusions from these two studies derive from evidence found in the studies themselves. This evidence, they assert, supports an entirely different interpretation of the 'psychology of conformity'.

Their analysis suggests that conformity is neither natural nor the (sole) cause of tyranny. Rather, our willingness to obey authority is conditioned upon our *identification* with the authority, and, "an associated belief that the authority is right."

Drawing upon their own analysis and previous examinations of historical atrocities (most specifically, the Nazi's attempted "eliminationist" campaign), Haslam and Reicher first

note that the others have questioned the commonly held belief that Nazi bureaucrats/officials were ever "just following orders".

Quoting from their recently published *PLoS Biology* paper:

"This may have been the defense they relied upon when seeking to minimize their culpability, but evidence suggests that functionaries like Eichmann had a very good understanding of what they were doing and took pride in the energy and application that they brought to their work. Also, typically, roles and orders were vague, and hence for those who wanted to advance the Nazi cause (and not all did), creativity and imagination were required in order to work towards the regime's assumed goals and to overcome the challenges associated with any given task. Emblematic of this, the practical details of "the final solution" were not handed down from on high, but had to be elaborated by Eichmann himself. He then felt compelled to confront and disobey his superiors—most particularly Himmler—when he believed that they were not sufficiently faithful to eliminationist Nazi principles."

The researchers then turn to our two classic psychology experiments, noting similarities in these experiments to the historical account of the Nazi campaign.

As to the Standford prison experiment, they note:

"So while it may be true that Zimbardo gave his guards no direct orders, he certainly gave them a general sense of how he expected them to behave. During the orientation session he told them, amongst other things, 'You can create in the prisoners feelings of boredom, a sense of fear to some degree, you can create a notion of arbitrariness that their life is totally controlled by us, by the system, you, me… We're going to take away their individuality in various ways. In general, what all this leads to is a sense of powerlessness.'

This contradicts Zimbardo's assertion that 'behavioral scripts associated with the oppositional roles of prisoner and guard [were] the sole source of guidance' and leads us to question the claim that conformity to these role-related scripts was the primary cause of guard brutality."

Haslam and Reicher also note that not all of the guards acted brutally towards the prisoners, and, that those who did act brutally "used ingenuity and initiative in responding to Zimbardo's brief" (that is, his prep talk to participants before the study started). Indeed, after the study was terminated, one of the student 'prisoners' confronted one of the guards that brutalized him, saying: "If I had been a guard I don't think it would have been such a masterpiece."

According to the authors, this contradicts the ingrained notion of the "banality of evil", insofar as the emergent tyranny of the guards "was made possible by the active engagement of enthusiasts rather than the leaden conformity of automatons." (they also allude to the subjects being "inspired" by Zimbardo).

As to the seminal experiments by Stanley Milgram, Haslam and Reicher first note that the measured action here — the flipping of a switch to apply the shock — offered no room for variation on the part of the teachers (unlike Zimbardo's subjects who had far more "creative" choices in which to carry out their roles).

More importantly, they point out that many subsequent researchers failed to draw upon Milgram's entire body of work regarding these experiments, and in so doing, *drew the wrong conclusions* from them.

Quote:

> "…it is clear that the 'baseline study' is not especially typical of the 30 or so variants of the paradigm that Milgram conducted. Here the percentage of participants going to 450 V varied from 0% to nearly 100%, but across the studies as a whole, a majority of participants chose not to go this far."

The researchers here took a closer look at Milgram's sessions and observed that subjects (the 'teachers') experienced various degrees of mental anguish due to being morally torn between the irreconcilable demands of two persons: Milgram's proddings to continue and the screams of the 'learners' who got the electric shocks.

The Authors state:

"They sweat, they laugh, they try to talk and argue their way out of the situation. But the experimental set-up does not allow them to do so. Ultimately, they tend to go along with the Experimenter if he justifies their actions in terms of the scientific benefits of the study (as he does with the prod "The experiment requires that you continue"). But if he gives them a direct order ("You have no other choice, you must go on") *participants typically refuse*." [emphasis added]

Here again, they note, the consensus view is cast into doubt; study subjects did what they did not out of blind conformity, but rather, *a belief that what they were doing was important*.

Tyranny as a Product of Identification-based 'Followership'

In questioning the 'banality of evil' paradigm, the authors draw upon their own more recent research with the BBC Prison Study, which sought to explore the dynamics of guards and prisoners more thoroughly. In this follow up to the Stanford experiment, the researchers took no leadership role (like Zimbardo), desiring to discover if participants would conform (to the "hierarchical script") or resist it.

From this latter-day prison experiment, three findings resulted. According to Haslam and Reicher:

"First, participants did not conform automatically to their assigned role. *Second*, they only acted in terms of group membership to the extent that they actively identified with the group (such that they took on a social identification). *Third*, group identity did not mean that people simply accepted their assigned position; instead, it empowered them to resist it. Early in the study, the Prisoners' identification as a group allowed them successfully to challenge the authority of the Guards and create a more egalitarian system."

But they also note that:

"Later on, though, a highly committed group emerged out of dissatisfaction with this system and conspired to create a new hierarchy that was far more draconian."

In summing up the findings from the BBC Prison Study, the authors assert that neither "passive conformity" to assigned roles, nor "blind obedience" to any rules, could account for the observed behaviors.

"…it was only when they had internalized roles and rules as aspects of a system with which they identified that participants used them as a guide to action. Moreover, on the basis of this shared identification, the hallmark of the tyrannical regime was not conformity but creative leadership and engaged *followership* within a group of true believers."

Similarly, in the Milgram experiments, it was *identification with the scientific enterprise*, as defined by Milgram, and a commitment to both the experiment and the Experimenter that served as the mechanism of compliance with Milgram's "prods"**.** This commitment stood above any commitment the teachers may have felt towards the 'learners' — or the general community (i.e., its norms, ethics and values).

Indeed, in a post-study debriefing by Milgram (in which he praised study subjects for their compliance even though it caused physical "discomfort" in the learners), participants expressed happiness that they had "been of service" and had contributed to an experiment from which "good" might come. Many expressed their support of future experiments of the kind.

Haslam and Reicher also note, significantly, that the *degree of identification* (with the Experimenter, or with the larger community) was not the same or constant across all variants of this study, especially if one changed the environment in which the study took place (a prestigious university verses some commercial/private-sector facility).

"More systematically, we have examined variations in participants' identification with the Experimenter and the science that he represents as opposed to their identification with the Learner and the general community. They always identify with both to some degree—hence the drama and the tension of the paradigm. But the degree matters, and greater identification with the Experimenter is highly predictive of a greater willingness

among Milgram's participants to administer the maximum shock across the paradigm's many variants."

Concluding Thoughts: **Beyond the 'Lucifer Effect'**

Haslam and Reicher argue that understanding the emergence of tyranny requires a deeper understanding of the situation and context in which this tyranny arises. Specifically, social and psychological scientists need to examine two inter-related phenomena, or processes, that come into play whenever people are subject to the directives of authority figures.

In their words:

"To understand tyranny, then, we need to transcend the prevailing orthodoxy that this derives from something for which humans have a natural inclination—a "Lucifer effect" to which they succumb thoughtlessly and helplessly (and for which, therefore, they cannot be held accountable). Instead, we need to understand two sets of inter-related processes: those by which authorities advocate oppression of others and those that lead followers to identify with these authorities."

While acknowledging that the consensus interpretation of these two experiments remains influential, the researchers emphasize that contrary evidence (observed within each experimental dynamic) has been ignored, even in studies that seem to support the idea that conformity (to authoritative directives) is "inevitable."



Auschwitz concentration camp, arrival of Hungarian Jews, Summer 1944

Further, they assert that this traditional, consensus view also ignores the clear evidence that

"…those who do heed authority in doing evil do so knowingly not blindly, actively not passively, creatively not automatically. They do so out of belief not by nature, out of choice, not by necessity. In short, they should be seen—and judged—as engaged followers not as blind conformists."

The fundamental assertion of this analysis is that tyranny flourishes, not because followers of authority are helpless to do otherwise, rather, because these followers identify with those authorities who "promote vicious acts as virtuous." Once achieved, this identification makes participants work more enthusiastically, and creatively, to ensure the success of the tyrannical directive.

It is both surprising, and predictable, that those who commit such acts *"actively wish to be held accountable—so long as it secures the approbation of those in power."* [emphasis added]

> * This term was coined in Hannah Arendt's account of the trial of Adolf Eichmann, a chief architect of the Nazis' "final solution to the Jewish question." Despite being responsible for the transportation of millions of people to their death, Arendt suggested that Eichmann was no psychopathic monster. Instead, his trial revealed him to be a diligent and efficient bureaucrat—a man more concerned with following orders than with asking deep questions about their morality or consequence. [source: the authors]

Citation for this article:

Contesting the "Nature" Of Conformity: What Milgram and Zimbardo's Studies Really Show S. Alexander Haslam, Stephen. D. Reicher ***PLoS Biology****:* Essay, published 20 Nov 2012 10.1371/journal.pbio.1001426

Top Photo: Nuremberg Trials. Defendants in the dock. The main target of the prosecution was Hermann Göring (at the left edge on the first row of benches), considered to be the most important surviving official in the Third Reich after Hitler's death.

Bottom Photo (Auschwitz concentration camp, arrival of Hungarian Jews, Summer 1944); **Bundesarchiv, Bild 183-N0827-318 / CC-BY-SA**

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Social Isolation Disrupts Brain's 'White Matter' Formation - Key to Brain Plasticity, MS and Mood Disorders

There are three general types of brain tissue: gray matter (the dendrite component of neurons), white matter (the myelin-coated, axon component of neurons) and *glial* matter (crucial cells that "support", protect and nourish these neurons).

The experience of interacting with our environment can trigger changes in brain cells that impact what is known as brain *plasticity* which is a measure of how well our brain cells adapt to environmental changes. But much of what determines this plasticity remains a mystery. For example, it was thought that only the brain's neurons changed in response to alterations in environmental conditions.

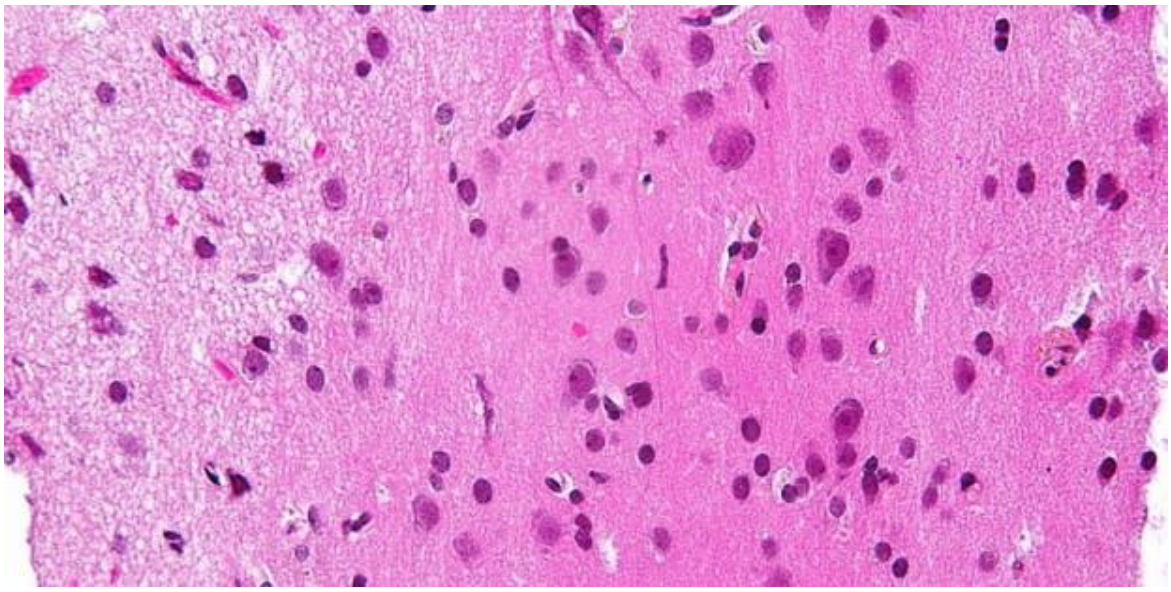
But new research by neuroscientists (Dietz and Liu) at the University at Buffalo and Mt. Sinai School of Medicine has revealed that certain types of glial cells — known as *oilgodendrocytes* — also play a critical role in brain plasticity. Under normal environmental conditions, these glial cells produce *myelin*, the fatty, whitish protein that coats a neuron's axon and which permits brain impulses to be conducted across the cell.

But the recent experiments with adult mice have revealed that *social isolation* triggers disruption in the formation of the myelin sheaths that envelop the neurons' axons. This disruption occurred primarily in the *prefrontal cortex* — a brain region critical for normal cognitive and emotional functioning.

Adult mice were socially isolated for an eight-week period to "induce a depressive-like state." The isolated mice were then introduced to a "novel" mouse (a mouse they had not seen previously). The isolated mice failed to interact with the new mouse (note: mice are instinctively social creatures) which was interpreted as a model of social avoidance and withdrawal.

Follow up analysis of the isolated mice brain tissue revealed that levels of gene transcription for oligodendrocytes were significantly reduced in the prefrontal cortex

The experiments revealed that social isolation produces stresses which in turn disrupt the sequence in which the white matter-making cells are formed.



Micrograph showing white matter with its characteristic fine meshwork-like appearance (left of image – lighter shade of pink) and grey matter, with the characteristic neuronal cell bodies

Previous research had linked changes in the brain's white matter (myelin) to psychiatric disorders including depression. *Demyelination* — the loss of normal nerve function — has also been linked to multiple sclerosis (MS) and Krabbe's disease, a rare and fatal childhood disease. And more recently, myelin alterations were observed in young and adolescent mice in response to certain environmental changes**.** But the exact mechanism that produces this alteration was unclear.

According to lead researcher Karen Dietz: "This research reveals for the first time a role for myelin in adult psychiatric disorders. It demonstrates that plasticity in the brain is not restricted to neurons, but actively occurs in glial cells, such as the oligodendrocytes, which produce myelin."

The researchers further noted that the key change in the prefrontal cortex lay within the cellular nuclei: there was less of a tightly-packed form of DNA known as *heterochromatin*. As oligodendrocytes mature, their DNA structure becomes more compacted. This state signals that the cell is mature and ready to produce myelin. But crucial (social) changes in environmental conditions, apparently, can result in less compaction.

Dietz explains: "This process of DNA compaction is what signifies that the oligodendrocytes have matured, allowing them to produce normal amounts of myelin. We have observed in socially isolated animals that there isn't as much compaction, and the oligodendrocytes look more immature. As adults age, normally, you would see more

compaction, but when social isolation interferes, there's less compaction and therefore, less myelin being made."

The good news from this research is that the impairment from social isolation is not (at least in *adult* mice) permanent; after a period of "social reintegration" myelin production levels returned to normal.*

This research not only underscores the deeply intertwined nature of one's environment and genes, but also indicates that "environmental intervention" can reverse the impacts of social isolation in adults. It is anticipated that this research will open new investigative paths for mood and myelin disorder studies.

It may also offer some hope for MS patients. Says Dietz:

"This research suggests that maybe recovery from an MS episode might be enhanced by social interaction."

The research report was published in the journal *Nature Neuroscience* online.

Major funding for the research came from the National Institutes of Health.

> * Similar studies on mice by Makinoden *et al* (2012) "show that mice isolated for 2 weeks *immediately after weaning* have alterations in prefrontal cortex function and myelination that do not recover with reintroduction into a social environment." [*Science*, 14 Sept., 2012, pgs. 1357-60

Quotes source: Univ. of Buffalo press release New form of brain plasticity: Study shows how social isolation disrupts myelin production.

Top Image: (Mood disorder) Idontknowtheworldtoday ; CC – By – SA 3.0

Bottom image: (grey/white matter micrograph); Nephron ; CC – By – SA 3.0

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Selfish? Maybe You Think Too Much

People who take more time to think over certain decisions — like how much money to contribute to a common pool — tend to give less than those who act more impulsively.

That's according to the results of a recent "public goods" experiment conducted by behavioral psychology researchers at Harvard University.

The debate over whether humans are, by nature, more selfish or more cooperative has raged for decades, with evidence supporting both conjectures.

Prior laboratory experiments showing a tendency for selfish actions have been criticized for not drawing their subject from a more representative population pool (most utilized young college students).

The Experiments

So, in this most recent study, the researchers drew upon users of the website Amazon Mechanical Turk, where people sign up to do small amounts of work for small amounts of money. Users come from a wider slice of the overall population, and so, are more representative of society. It is also a favorite on-line laboratory for social scientists.

In the experiment — a decision-making game called "public goods" game — voluntary participants were separated into smaller groups of four, given .40 cents each, and then asked how much they wanted to contribute to a common pool. They were also told that whatever amount ended up in the pool would be doubled and the total divided amongst each member of the group.

Thus, if everyone contributed their entire allotment, that is, if they acted cooperatively, they would see their share double.

However, the instructions given to participants indicated that the game would reward selfishness. If, for example, one player chose to contribute nothing, s/he would end up receiving .60 (giving him/her 1.00) while the others received much less as their share. Of course, if no one contributed anything, participants would retain the original 40 cents.

The Results

A total of ten experiments were conducted.

Those who decided quickly contributed on average 27 cents, while those who decided slowly end up giving on average only 21 cents. In this first experiment, subjects were not told to decide quickly or otherwise.

This experiment was followed up with a second one in which some participants were instructed to decide within ten seconds, while others were told to wait *at least* ten seconds before deciding (in order to "think more carefully"). But the same thing happened: the people who decided quickly contributed larger amounts than those who deliberated longer.

Lead researcher David Rand believes that spending more time deliberating how much to give may allow that person to realize that he can achieve greater benefit from being selfish. Rand explains:

"If they stop and think about it, they realize, Oh, this is one of those situations where actually I can take advantage of the person and get away with it."

These results were confirmed back in the university lab (using a less representative subject pool); although these lab subjects gave less on average than the on-line subjects, quick deciders still gave more.

According to the researchers (quoting from the paper abstract):

"…we propose that cooperation is intuitive because cooperative heuristics are developed in daily life where cooperation is typically advantageous…Our results provide convergent evidence that intuition supports cooperation in social dilemmas, and that reflection can undermine these cooperative impulses."

The full results of the ten experiments were published last month in Nature, under the title '**Spontaneous giving and calculated greed'** , by authors David G. Rand, Joshua D. Greene, and Martin A. Nowak

Author's After-thoughts:

It should be noted that even those who deliberated longer still gave *some* amount of money; "pure" selfishness — in which one or more subjects gave nothing — did not occur.

This fact may be the result of the study design and rules; in reality, such "games" (e.g., an investment pool that doubles each contributor's share) do not exist (or are exceedingly rare).

Although the authors state that "heuristics are developed in daily life where cooperation is typically advantageous", our real-world societies may offer more opportunities to act selfishly (such as in the stock market, where short-selling is common). Further, some social values (here in the U.S.) champion "individual competitiveness" and "winner take all" competitive behaviors (a type of which is known as a "zero sum game" in Gamer Theory).

However, these later behaviors may be recently evolved, "over-layers" on our basic human (biological) tendencies to act cooperatively. In the classic "Prisoner's Dilemma" game, most participants' first instinct is to cooperate (i.e., trust that others will act cooperatively too), while "defection" from the cooperative norm tends to spread through the group only when one, or a few, decide at some point to act non-cooperatively.

In Game Theory, the most "winning" strategy is to copy your opponent's strategy; if he cooperates, then you cooperate; if he defects, then you defect.

Thus, some socially selfish behaviors (those that can be represented in a game, anyways) may be the result of modeling others who act selfishly, an instinctive response to selfish behavior, perhaps, but not reflective of our basic human natures. Further, this defection from a cooperative style of play can quickly back-fire on the original defector, as too many copy-cat defectors will reduce the original defector's gains over time. And, according to new research by Stewart and Plotkin (2013), the best long-term strategy (in a social PD game scenario) is the 'generous' (i.e. always cooperate) strategy, as it tends to be copied by most all of the other players and thus creates a type of social pressure on any would-be defectors to do likewise.

Finally, there is abundant evidence that we are cooperative — a trait known as "prosociality" — by nature, with some evidence of prosocial behaviors, such as imitation, teaching, and sharing, existing in human infants as young as 8 months. Such findings are strong indicators that prosociality and cooperative behavior is in-borne.

Top image: *Le Penseur* (Auguste Rodin); Daniel Stockman

Original URL for this article: http://planetsave.com/2012/10/07/selfish-maybe-you-think-too-much/

Word count: 961

Reminders of Death Motivate Concern for Environmental Legacy ʙ New Study Reveals



Researchers from three university business schools recently conducted a pair of ‘death priming’ experiments in which participants were tasked with making decisions about what to do with lottery winnings, and, how to allocate a new-found energy source. Those participants who received the death primes (i.e., subtle reminders of mortality) consistently gave more to “future others” when tasked with charitable or energy allocation decisions.

The 90 adult participants (65 of whom were females) were all asked to read a news item and to comment on the writing style (this was done to throw off participants as to the prime, or “manipulation”). They were then asked to fill out the Positive and Negative Affect Schedule (PANAS), engage in a word completion task, and respond to a survey designed to measure
‘generative motivations’, including concern for their lasting impact. They were asked to rate how strongly they agreed with each of these three statements:

It is important to me to leave a positive legacy for future generations.

I have made and created things that have had an impact on other people.

I feel that I have done something that will
survive after I die.”

Before any decision-making happened, some study subjects were primed with material (news articles or word lists) that subtly reminded them of their mortality, of their

inevitable death. The remainder served as control groups and were not given any death primes.

The researchers wondered if such 'mortality salience' would motivate these subjects to act against their more typical instincts of reward-seeking in the present and/or giving to those we are personally connected to and whose benefiting we can see immediately. And so, they developed what they call and "ecologically-valid" prime to test this possibility.

It's Human Nature to Seek Rewards in the Present

When we make decisions that involve some form of reward (including the reward we feel when giving to others), we tend to focus on those that deliver these rewards in the short-term. Previous studies have shown that we normally do not make decisions that have no personal benefit incentive, even knowing that our choice(s) would benefit "future others". This is known as 'intertemporal discounting'.

Consider this scenario: You have just purchased a lottery ticket. Your thoughts naturally dwell on what you will do with the money, how you will spend it, should you win. Your decision(s) about what to do with the money will largely be determined by your need or desire for rewarding yourself in the present. Now, a few of us might decide to give some or all of the money away to a charity that is helping people right now, in the present. But few of us would do so if we knew that the charitable giving would be enjoyed by "future others", those we will most likely never meet or know.

A similar situation exists when dealing with environmental impacts; we humans live only about 70 years or so — far too short a time to see the collective impacts of our energy usage and consumer choices. And so, our choices to drive certain kinds of cars, use certain types of fuel, consume certain kinds of products, are generally based upon how these will satisfy our present needs and desires (on a larger scale, this *discounting* is reflected in the false choice of "creating jobs versus protecting the environment").

Our day-to-day, environmentally impacting decisions are seldom made on the basis of how these decisions and actions will impact future generations. This is referred to as 'intergenerational discounting' and it is the crux of what psychological researchers refer to as the 'intergenerational dilemma.' This discounting dilemma is enhanced by *not knowing* those (the "future others") who might benefit from our choices in the future. Thus there is a 'social distance' in choosing to benefit those in the future, as well as a temporal one.

The research team, led by Dr. Wade-Benzoni, chose to focus on this dilemma and to test whether subjects' normal/expected decisions could be reversed — their 'generative motivation' increased – through presenting some subjects with reminders of their mortality.

The Results of Two Experiments:

In both experiments, the experimenters' hypothesis of positive 'legacy motivation' was validated.

"Creating a positive legacy offers people a means of symbolic immortality. This psychosocial benefit is powerful enough to overcome very basic human tendencies to discount the value of benefits that will be enjoyed by others in the future." — Kimberly Wade-Benzoni, Duke University **Fuqua** School of Business

In the first experiment, subjects were told that their names were entered into a lottery in which they might win 1000.00. All were given the option of donating a portion of their potential winnings to a charity that was helping people in the present (present-oriented), or, donating to a charity that would help other in the future (future-oriented). Those who received the primes (as opposed to "neutral material", for the controls) opted to give more to the future-oriented charity.

In the second experiment, subjects were asked to play the role of vice president of a big energy corporation that had just discovered a new, efficient, inexpensive energy source. The study subjects then had to decide how much of the energy supply* their company should use "today", versus, how much should be conserved and allocated to another recipient. Some study subjects were also given the option of donating to another organization that would see immediate benefit from the donation, while others were given the option of giving to another group that would benefit in the future, or, donating the allotment of energy to their own organization in the future. In each case, subjects were told the any beneficiaries would make better use of the energy in the future than their company would right now.

All participants were then asked to make their energy allocations, but some were given death primes (i.e., short tasks that tend to produce thoughts of mortality). To reveal their emotional connection to future generations of people, subjects were asked whether they felt any "affinity" for the future group.

Once again, study participants who received the mortality primes were more likely to allocate the energy supply for future beneficiaries. Further, this 'generative motivation' to help others in the future was linked to the subject's *sense of connectivity* to those beneficiaries.

"Acting on the behalf of future generations can paradoxically represent a dramatic form of self-interest – immortality striving. Believing that we have made a difference by leaving a group, an organization, a professional field, or the world a better place helps us to gain a sense of purpose in our lives and buffer the threat of meaninglessness posed by death." — Dr. Wade-Benzoni

The researchers have described their results as 'counter-intuitive' in that, after mortality priming, subjects were more generous to future others than to present others.

And so it would appear that our *intergenerational discounting* – decision making on the basis of present benefits — can be *reversed*; primed with thoughts of death, our legacy motivation kicks in, and our decisions are more likely to promote 'intergenerational benificence'.

This is rather fortunate for future generations (better late in life, than never).

After all, we all want History — those *future others* — to honor us, not condemn us.

The paper, **'It's Only a Matter of Time: Death, Legacies, and Intergenerational Decisions',** was published in the journal *Psychological Science.* Members of the research team included Kimberly A. Wade-Benzoni, Richard Larrick (Fuqua School of Business, Duke University), Leigh Plunkett Tost (Ross School of Business, University of Michigan), and Morela Hernandez (Foster School of Business, University of Washington).

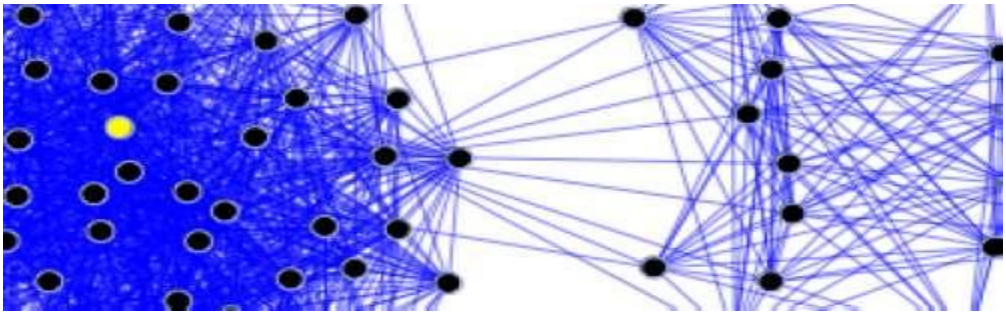
> * Note: The researchers did not specify to the participants, at any point, whether or not the putative new energy source was finite or replenishable; this was consistent throughout the experiments.

Top image: (Rockport, Mass. cemetery) M. Ricciardi

Original URL for this article: http://planetsave.com/2012/07/12/reminders-of-death-motivate-concern-for-environmental-legacy-new-study-reveals/

Word count: 1285

Cooperate with Thy Neighbor? Depends on Your Neighbors - Largest Ever, Real-Time, Social Cooperation Experiment



Ah, To Cooperate or Defect?

It's known as 'The Prisoner's Dilemma' and is a type of cooperation-strategy game well-known amongst Game Theorists and Computational Scientists. In the game, players mutually benefit from cooperating ("collaborating") with each other (they each earn modest financial reward). But greater benefit can be gained, by one player, by 'defecting' from the mutually beneficial, collaborative behavior. This latter behavior tends to promote its own spread*, until one may be left with a situation in which no one cooperates or benefits.

That can spell bad news for a society or social network.

In fact, most social scientists studying the problems and conflicts of social cooperation believe that a society (or social network) in which the *majority* collaborate is unattainable, and many have conjectured that the structure of the population determines the level of cooperation.

But how to test this hypothesis? Answer: conduct a large-scale, synchronized, Prisoner's Dilemma game and track the decisions players make in real-time.

Conducted on December 20 of last year at La Espacio Zaragoza Activa, Aragon (an 'autonomous community' of Spain), it was the largest 'scientific-social cooperation' experiment ever carried out, and involved the participation of 1303 high school students from 42 schools in Aragon — all monitored over a three-hour period by a sizable consortium of researchers.

What do the results of this Experiment tell us about Social Cooperation?

Data is still being analyzed, but one of the most salient findings was that ***different types of people tended to arise*** in the experimental groupings, and, that ***these types tended to occur in roughly the same frequency***.

In any given social group or network, approximately 5% always try to help (cooperate with) their neighbors, with just over a third (35%) who never do (these tend to 'defect' from the collaboration the soonest)…the remaining 60% occasionally cooperated, depending (most often) on two factors: their *mood* at the time, and, *what their neighbors did* (how cooperative they were) *previously*.



Research panel monitoring the largest social cooperation study ever conducted to determine the problems and conflicts arising from cooperation in present day society.

Other Findings from the Social Cooperation Experiment

Interestingly — but not surprising to many — there was a difference in the level of cooperation according to sex; in general, girls cooperated 10% more than did boys.

Also noted in the early analysis was that the type of high school program being studied had a slight impact on cooperation; students in a humanities and/or social science program showed a 4% higher cooperation level than did those studying in a scientific technology program.

In terms of interesting, but negative, findings, analysis showed that there were no significant differences in cooperation levels amongst players based upon family size (i.e., whether only children or possessing siblings), nor any differences based upon geographical origin (i.e., rural or urban residence).

As a whole, a 35% cooperation rate was observed in the student participants.

So, extrapolating to the real world: if you ask your neighbors for help often, over all, there's a (slightly better than) one in three chance that he/she/they will cooperate (but you might improve your odds by *being neighborly to them, first*).

Two Tests, Two Network Types, One Hypothesis: "The Urgency of the Cooperation"

An important feature of this experiment was that it included two types of groups: one group was comprised of "regular networks", where every member of the groups had the same number of social connections (classmates, neighbors), with the second group being "scale free" (or heterogeneous), that is, some members were connected to many neighbors, while others were connected to very few.

Cooperative behavior was monitored to determine if it varied when players *always interacted with the same neighbors/classmates*, versus, when the structure of their network was changed randomly (by the researchers) after each interaction (i.e., the playing of the Prisoner's Dilemma game with different neighbors each time).

In this way, researchers were able to test their hypothesis that the structure of the population determines the level of cooperation (the "urgency of the cooperation"). Early analysis of the data seems to confirm that "the structure of the interaction network" influences a "medium level of cooperation".

More complete analyses of the data from this first-of-its-kind social experiment are expected in future journal publications.

The experiment was organized by researchers from the Instituto Biocomputación y Física de Sistemas Complejos (The Institute for Biocomputation and Physics of Complex Systems) (BIFI) at the Universidad de Zaragoza, together with the Fundación Ibercivis and Universidad Carlos III de Madrid (UC3M).

*** This is known as the 'Rapoport strategy', Anatol Rapoport, who developed the algorithm for the most successful game-winning strategy, i.e., "copy your opponent" (or "tit for tat"). Some social scientists (like Hammerstein) feel that applications of the PD game to real-life situations have limited value for providing insight into human nature, arguing that Nature provides far more opportunities for *variable cooperation*, as opposed to the either/or (cooperate or defect) choices of the PD model, despite its usefulness in mathematical models.**

Top Image: DarwinPeacock ; Creative Commons Attribution 3.0 Unported

Bottom image: UC3M press release

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Word count: 828

Beliefs That Others' Beliefs are Changeable Are Key to World Peace, New Studies Find



Yitzhak Rabin, Bill Clinton, and Yasser Arafat during the Oslo Accords on 13 September 1993.

Successful conflict resolution –especially long-standing conflicts — requires overcoming barriers to peace and compromise. Chief among these barriers are the intensely negative feelings and attitudes towards the 'other'; there is a natural and pervasive belief shared by both sides in a conflict: that the other group's beliefs are fixed and inflexible (Kelman, 2007).

However, direct attempts to change the beliefs of members of a conflict – whether through government policy or outside (foreign) intervention or mediation — often fail by fostering a defensive reaction (Bar Tal, Rosen, 2009).

In four recent studies (Halperin *et al*), psychological researchers decided to test less direct approaches to conflict resolution – focusing on beliefs about whether groups can change.

Previous research on intergroup conflict and group beliefs

This recent research was prompted by previous studies on intergroup beliefs about the flexibility or inflexibility of other group's beliefs.

In two such studies, researchers found that those who believe people are “malleable” (versus “fixed”) are less likely to judge wrong-doing as being part of a person’s fixed traits, and are less likely to advocate punishment for the wrong-doer, and more willing to support negotiation (Chiu *et al*, 1997, second study: Chiu *et al*, 1997).

Further, when faced with negative behavior, group members who believed that human traits/qualities are malleable were more likely to understand the behavior and more likely to attribute it to a person’s immediate motivation and situation, as opposed to their fixed traits (Chiu *et al*, 1997). These types also tended to propose solutions to the negative behavior that would alter said motivati0n and situation, such as negotiation or education.

Not unexpectedly, punishment and retaliation were the predominant reaction amongst those group members who attributed wrong-doing to unchangeable traits.

The current research findings:

In these most recent studies, the research team of Israeli political scientists and US psychologists, conducted surveys amongst groups of Israelis and Palestinians, the largest of which drew upon a nationwide sample of 500 Israeli Jews. Results of this study showed that a prior “belief that groups were malleable predicted positive attitudes towards Palestinians, which in turn predicted willingness to compromise.”



Israel with the West Bank, Gaza Strip and Golan Heights (latter three territories shown in orange)

In the three remaining studies (of smaller sample sizes), the researchers “experimentally induced malleable versus fixed beliefs about groups” using Israeli Jews, Palestinian citizens of Israel, and West Bank Palestinians — without mentioning the enemy

("adversary") by name. This produced "more positive attitudes towards the *outgroup* and…increased willingness to compromise for peace."

The key findings and conclusions:

Not surprisingly, the more positive the attitudes toward the outgroup, the greater the support for major compromises with that outgroup (such as land concessions, travel/work freedoms, social autonomy, etc.).

Perhaps the most crucial finding in these studies was the key role that *willingness to meet* (with the other) plays in mediating the relation between attitudes toward another group and contact with member of that group. This supports long-standing findings from other researchers (Ajzen, Fishbein, 2005) showing that "the willingness to act or interact was one of the most robust predictors of behavior."

Boiling things down even further, the researcher found a "high correlation" between this desire or willingness to meet and t*he willingness to compromise*.

The researchers ponder whether adding a "beliefs about groups" component to current conflict resolution programs would increase the effectiveness of these efforts in the short and long-term.

Halperin *et al* conclude:

> **"Our research shows that even in the face of prolonged conflict, deeply rooted beliefs may be malleable, and mechanisms may exist for bringing more constructive attitudes to the fore. In thinking that groups have the potential to become better, adversaries may be more likely to bypass fixed, global, negative judgments — judgments that delegitimize or dehumanize each other — even when they have a long history of mutual antagonism."**

The study 'Promoting the Middle East Peace Process by Changing Beliefs About Group Malleability' (Halperin *et al*), was published in the 23 September issue of *Science.*

Author Comments:

Translation – If you are willing to meet with me, I am willing to compromise with you. It seems to me that the findings in these studies are almost self-evident or obvious; how could something (seemingly) so simple and basic be ignored or unconsidered in previous (via third party) negotiations? Makes one wonder how many past conflict resolution efforts were just people acting instinctively or just blundering through a process hoping for the best (or expecting the worst)?

While I am gladdened by this research overall, I will only note that the three smaller surveys did not include Israeli settlers living on contested Palestinian land (mostly in the West Bank). Would the "willingness to meet" criteria still hold in this case? If so, can one

assume that forces internal and/or external to that group (the settlers) are reinforcing barriers to compromise (either actively or through neglect)?

What often goes unmentioned in the Israeli-Palestinian conflict is the issuance of water rights/access on the West Bank (which encompasses land above a large section of the main aquifer in the region); the land is, after all, a desert.

So, to what extent are barriers to compromise and peace between groups driven/reinforced by resource allocation (or appropriation) and scarcity? Must any resource imbalance be addressed before actual negotiation or compromise takes place?

Top photo: Vince Musi / The White House

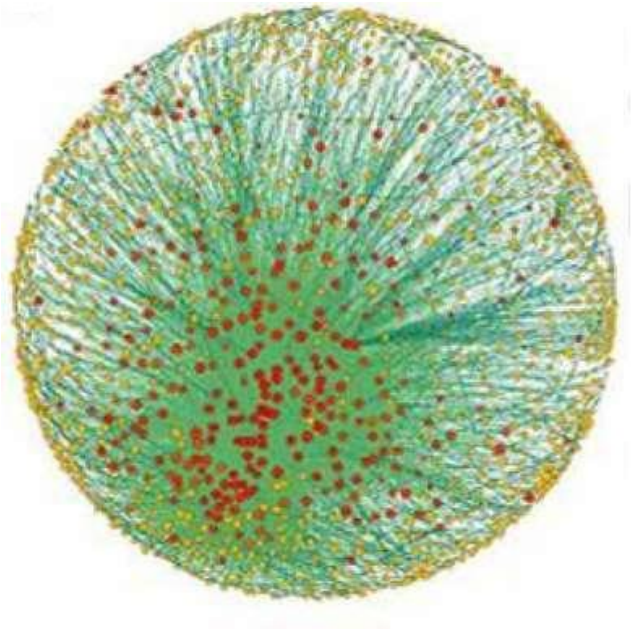
Peace process map: ChrisO at en.wikipedia

Original URL for this article:
http://planetsave.com/2011/11/11/beliefs-that-others-beliefs-are-changeable-are-key-to-world-peace-new-studies-find/

Word count: 891

Who Runs the World? Network Analysis Reveals 'Super Entity' of Global Corporate Control

In the first such analysis ever conducted, Swiss economic researchers have conducted a global network analysis of the most powerful transnational corporations (TNCs). Their results have revealed a core of 737 firms with control of 80% of this network, and a "super entity" comprised of 147 corporations that have a controlling interest in 40% of the network's TNCs.



Strongly Connected Component (SCC); layout of the SCC (1318 nodes and 12,191 links). Node size scales logarithmically with operation revenue, node color with network control (from yellow to red). Link color scales with weight.

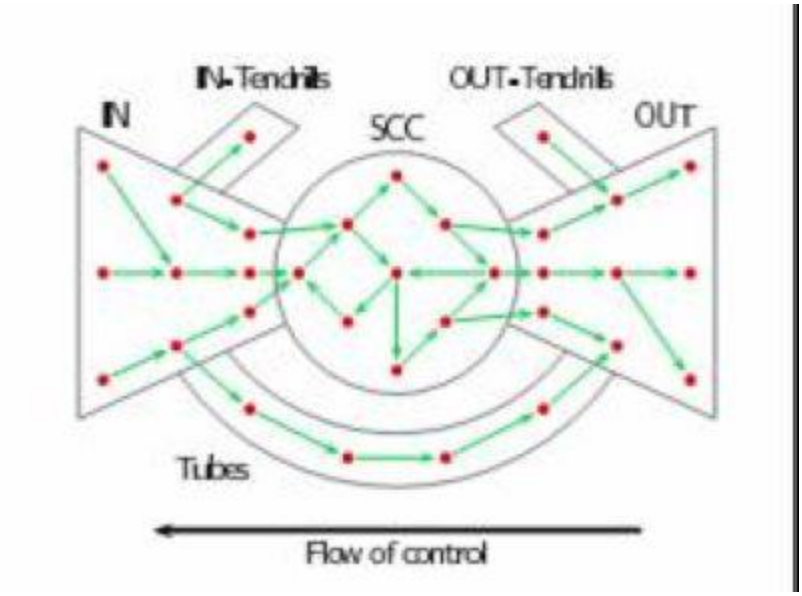
[Note to the reader: see the very end of this article for a ranking of the top 50 'control holders']

When we hear conspiracy theorist talk about this or that powerful group (or alliance of said groups) "pulling strings" behind the scenes, we tend to dismiss or minimize such claims, even though, deep down, we may suspect that there's some degree of truth to it, however distorted by the theorists' slightly paranoid perception of the world. But perhaps our tendency to dismiss such claims as exaggerations (at best) comes from our inability to get even a slight grip on the complexity of global corporate ownership; it's all too vast and complicated to get any clear sense of the reality.

But now we have the results of a global network analysis (Vitali, Glattfelder, Battiston) that, for the first time, lays bare the "architecture" of the global ownership network. In the paper abstract, the authors state:

> "We present the first investigation of the architecture of the international ownership network, along with the computation of the control held by each global player. We find that transnational corporations form a giant bow-tie structure* and that *a large portion of control flows to a small tightly-knit core of financial institutions*. This core can be seen as an economic "super-entity" that raises new important issues both for researchers and policy makers." [emphasis added]

* This "bow tie" structure is similar to the structure of the WWW (analyzing for most influential/most trafficked websites); see diagram below.



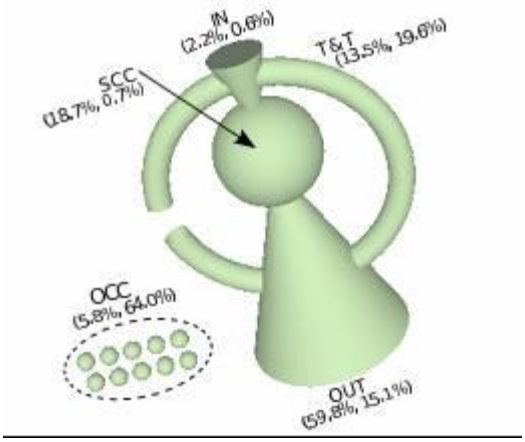
Data from previous studies neither fully supported nor completely disproved the idea that a small handful of powerful corporations dominate much or most of the world's commerce. The researchers acknowledge previous attempts to analyze such networks, but note that these were limited in scope to national networks which "neglected the structure of control at a global level."

What was needed, assert the researchers, was a complex network analysis.

"A quantitative investigation is not a trivial task because firms may exert control over other firms via a web of direct and indirect ownership relations which extends over many countries. Therefore, a complex network analysis is needed in order to uncover the structure of control and its implications. "

To start their analysis, the researchers began with a list of 43,060 TNCs which were taken from a sample of 30 million "economic actors" contained in the Orbis 2007 database [see end note]. TNCs were identified according to the Organization of Economic Co-operation and Development (OECD) definition of a transnational corporation [see end note]. They next applied a recursive search algorithm which singled out the "network of all the ownership pathways originating from and pointing to these TNCs."

The resulting TNC network includes 600,508 nodes and 1,006,987 ownership ties.



Bow-tie structure of the largest connected component (LCC) and other connected components (OCC). Each section volume scales logarithmically with the share of its TNCs operating revenue. In parenthesis, percentage of operating revenue and number of TNCs

In terms of the connectivity of the network, the researchers found that it consists of many small connected components, but the largest one (encompassing 3/4 of all nodes) "contains all the top TNCs by economic value, accounting for 94.2% of the total TNC operating revenue."

Two generalized characteristics were identified:

1] A *strongly connected component* (SCC), that is, a set of firms in which every member owns directly and/or indirectly shares in every other member. The emergence of such a structure can be explained as a means of preventing take-overs, reducing transaction costs, risk sharing and increasing trust between "groups of interest."

and

2] The *largest connect[ed] component contains only one dominant, strongly connected component* (comprised of 1347 nodes). This network, like the WWW, has a *bow tie* structure. What's more, they found that this component, or core, is also very densely connected; on average, members of this core have ties to 20 other members. "Top actors" occupy the center of the bow tie. In fact, *a randomly chosen TNC in the core has about 50% chance of also being among the top holders*, as compared to, for example, 6% for the "in" section. [emphasis added]

> "As a result, about 3/4 of the ownership of firms in the core remains in the hands of firms of the core itself. In other words, this is a tightly-knit group of corporations that cumulatively hold the majority share of each other."

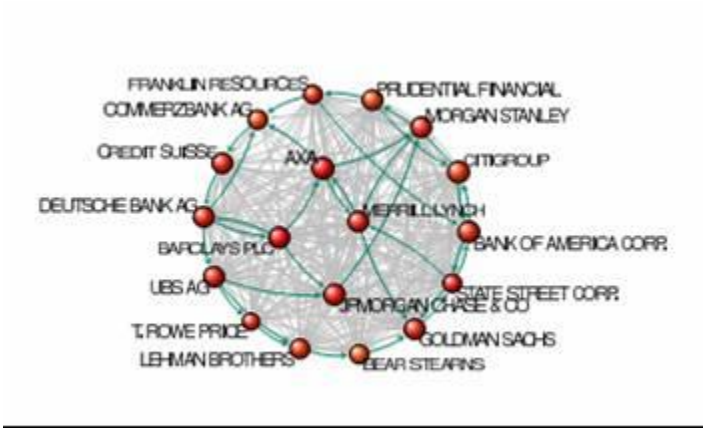
In examining the details of this core, the analysis also showed that only 737 top holders accumulate 80% of the control over the value of all TNCs (in the analyzed network). Further,

> "…despite its small size, the core holds collectively a large fraction of the total network control. In detail, *nearly 4/10 of the control over the economic value of TNCs in the world is held, via a complicated web of ownership relations, by a group of 147 TNCs in the core, which has almost full control over itself*. The top holders within the core can thus be thought of as an economic "super-entity" in the global network of corporations." [emphasis added]

Concerning the implications of this super entity, the researchers asked two fundamental questions: First, what are the implications for *market competition*, and, second, what are the implications for *economic stability*?

Regarding the first question, the authors assert that no matter the origin of the SCC, due to its high degree of TNC network control, "it weakens market competition".

It is clear just from the history of anti-trust laws in this country (the U.S.) that concentrated ownership stifles free market competition and innovation, reduces over-all employment, and leads to excessive pricing.



Zoom on some major TNCs in the financial sector. Some cycles are highlighted. Note: data for this analysis comes from the 2007 Orbis database — prior to the 2008 financial crisis, thus, firms such as Bear Stearns and Lehman Bros. are included.

In regards to the second question, the researchers note that "the existence of such a core in the global market was never documented before and thus, so far, no scientific study demonstrates or excludes that this international 'super-entity' has ever acted as a bloc."

However, there is historical data — such as within the airline, auto and steel industries — supporting this possibility.

"…top holders are at least in the position to exert considerable control, either formally (e.g., voting in shareholder and board meetings) or via informal negotiations."

Additionally, recent studies (Stiglitz J.E., 2010, Battiston S. *et al*, 2009) have shown that densely connected financial networks are highly susceptible to systemic risk. Despite the fact that such networks may seem robust in good economic times, in times of crisis however, member firms tend to enter 'distress mode' simultaneously. This was seen recently in the 2008 ("near") financial collapse (note: 3/4 of the network *core* in this analysis are financial intermediaries).

Calling their findings "remarkable", they suggest that because "international data sets as well as methods to handle large networks became available only very recently, [this] may explain how this finding could go unnoticed for so long."

While the researchers acknowledge that *verifying* whether the implications of their findings "hold true for the global economy" is beyond the scope of their current research, they assert that their unprecedented attempt to uncover the structure of corporate control is "a necessary precondition for future investigations."

The paper, The network of global corporate control (Vitali, Glattfelder, Battiston) was published July 26, 2011, on *arXiv.org*

End Notes:

The **Orbis 2007 marketing database** comprises about 37 million economic actors, both physical persons and firms located in 194 countries, and roughly 13 million directed and weighted ownership links (equity relations). This data set is intended to track control relationships rather than patrimonial relationships. Whenever available, the percentage of ownership refers to shares associated with voting rights. Accordingly, [they] select those companies which hold at least 10% of shares in companies located in more than one country. Overall, we obtain a list of 43,060 TNCs located in 116 different countries, with 5675 TNCs quoted in stock markets.'

The **definition of TNCs given by the OECD** states that they "…comprise companies and other entities established in more than one country and so linked that they may coordinate their operations in various ways…"

Diagrams: (source) The network of global corporate control (Vitali, Glattfelder, Battiston) via arxiv.org / PLoS [**doi:10.1371/journal.pone.0025995.g002**] cc-by 2.5

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Top 50 Control-Holders Ranking:

{Source: the following is quoted directly from the research paper [cited above]; rankings may have changed since the publication of the original paper and the blog article}
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This is the first time a ranking of economic actors by global control is presented. Notice that many actors belong to the financial sector (NACE codes starting with 65,66,67) and many of the names are well-known global players.

The interest of this ranking is not that it exposes unsuspected powerful players. Instead, it shows that many of the top actors belong to the core. This means that they do not carry out their business in isolation but, on the contrary, they are tied together in an extremely entangled web of control. This finding is extremely important since there was no prior economic theory or empirical evidence regarding whether and how top players are connected.

Shareholders are ranked by network control (according to the threshold model, TM). Columns indicate country, NACE industrial sector code, actor's position in the bow-tie sections, cumulative network control. Notice that NACE codes starting with 65,66, or 67 belong to the financial sector.

Rank, Economic actor name, Country, NACE code, Network Cumulative Network position, control (TM, %)

1 BARCLAYS PLC GB 6512 SCC 4.05

2 CAPITAL GROUP COMPANIES INC, THE US 6713 IN 6.66

3 FMR CORP US 6713 IN 8.94

4 AXA FR 6712 SCC 11.21

5 STATE STREET CORPORATION US 6713 SCC 13.02

6 JP MORGAN CHASE & CO. US 6512 SCC 14.55

7 LEGAL & GENERAL GROUP PLC GB 6603 SCC 16.02

8 VANGUARD GROUP, INC., THE US 7415 IN 17.25

9 UBS AG CH 6512 SCC 18.46

10 MERRILL LYNCH & CO., INC. US 6712 SCC 19.45

11 WELLINGTON MANAGEMENT CO. L.L.P. US 6713 IN 20.33

12 DEUTSCHE BANK AG DE 6512 SCC 21.17

13 FRANKLIN RESOURCES, INC. US 6512 SCC 21.99

14 CREDIT SUISSE GROUP CH 6512 SCC 22.81

15 WALTON ENTERPRISES LLC US 2923 T&T 23.56

16 BANK OF NEWYORK MELLON CORP. US 6512 IN 24.28

17 NATIXIS FR 6512 SCC 24.98

18 GOLDMAN SACHS GROUP, INC., THE US 6712 SCC 25.64

19 T. ROWEPRICE GROUP, INC. US 6713 SCC 26.29

20 LEGG MASON, INC. US 6712 SCC 26.92

21 MORGAN STANLEY US 6712 SCC 27.56

22 MITSUBISHI UFJ FINANCIAL GROUP, INC. JP 6512 SCC 28.16

23 NORTHERN TRUST CORPORATION US 6512 SCC 28.72

24 SOCIÉTÉ GÉNÉRALE FR 6512 SCC 29.26

25 BANK OF AMERICA CORPORATION US 6512 SCC 29.79

26 LLOYDS TSB GROUP PLC GB 6512 SCC 30.30

27 INVESCO PLC GB 6523 SCC 30.82

28 ALLIANZSE DE 7415 SCC 31.32

29 TIAA US 6601 IN 32.24

30 OLD MUTUAL PUBLIC LIMITED COMPANY GB 6601 SCC 32.69

31 AVIVA PLC GB 6601 SCC 33.14

32 SCHRODERS PLC GB 6712 SCC 33.57

33 DODGE & COX US 7415 IN 34.00

34 LEHMAN BROTHERS HOLDINGS, INC. US 6712 SCC 34.43

35 SUN LIFE FINANCIAL, INC. CA 6601 SCC 34.82

36 STANDARD LIFE PLC GB 6601 SCC 35.2

37 CNCE FR 6512 SCC 35.57

38 NOMURA HOLDINGS, INC. JP 6512 SCC 35.92

39 THE DEPOSITORY TRUST COMPANY US 6512 IN 36.28

40 MASSACHUSETTS MUTUAL LIFE INSUR. US 6601 IN 36.63

41 INGGROEP N.V. NL 6603 SCC 36.96

42 BRANDES INVESTMENT PARTNERS, L.P. US 6713 IN 37.29

43 UNICREDITO ITALIANO SPA IT 6512 SCC 37.61

44 DEPOSIT INSURANCE CORPORATION OF JP JP 6511 IN 37.93

45 VERENIGING AEGON NL 6512 IN 38.25

46 BNPPARIBAS FR 6512 SCC 38.56

47 AFFILIATED MANAGERS GROUP, INC. US 6713 SCC 38.88

48 RESONA HOLDINGS, INC. JP 6512 SCC 39.18

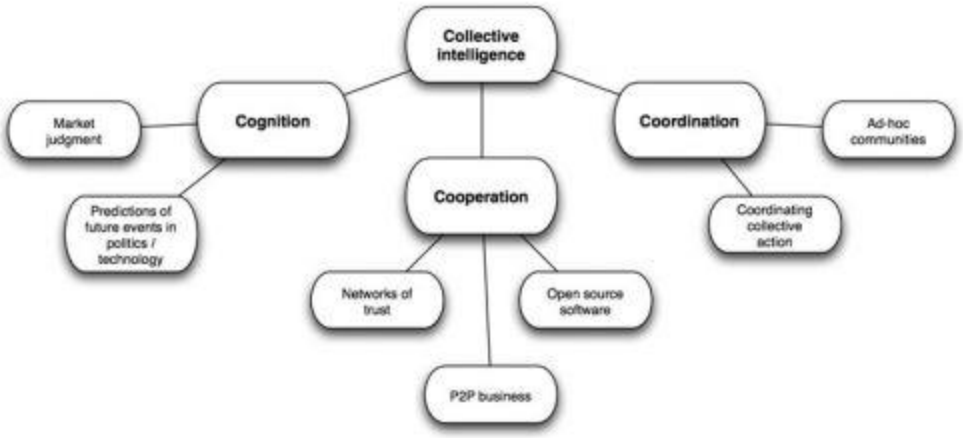
49 CAPITAL GROUP INTERNATIONAL, INC. US 7414 IN 39.48

50 CHINA PETROCHEMICAL GROUP CO. CN 6511 T&T 39.78

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'Group Intelligence Factor' Revealed, Social Sensitivity is Key



Psychologist have long-recognized a general intelligence factor, known as '*g*', that correlates *individual* performance on cognitive tasks (how a person does on one test strongly predicts his/her performance on another test), and they have even studied how average intelligence of group members predicts group performance, but the idea that groups might have their own *collective* intelligence ('c') was virtually ignored.

Recently, two tandem studies conducted by Woolley *et al* (*Science*, 29 October, 2010*) have revealed strong evidence for 'c', a *collective intelligence factor*. Working with almost 700 individuals organized into groups of between 2 and 5 members each, the researchers put the groups through their cognitive paces, giving them a wide range of cognitive tasks to perform.

Tasks in the first study included: solving visual puzzles, brainstorming, making collective moral judgments, and negotiating over limited resources. As a "task criterion", to establish a group baseline performance, each test session ended with a game of checkers between each group and a computer opponent. All individuals were given standardized intelligence test prior to conducting the study.

Various statistical methods were used to analyze the socio-metrics; the results consistently yielded one factor that accounted for over 40% of the groups' variance (the main variable being measured) in performance. This emergent, collective factor was used successfully to predict group performance on other tasks. In statistical analyses that seek to "flesh out" a causal factor, this is a big result. As a comparison, an analysis of the average and maximum intelligence scores found that these did not significantly correlate with test scores, nor were they very good at predicting "criterion task performance".

As a control, an architectural design problem was given to 63 of the individual participants. In this case, individual intelligence was indeed a significant predictor of performance on the task. But the researchers discovered that something else is a more powerful predictor of outcome when an individual joins a task-oriented group.

Comparison of Principal Axis Factor Loadings for Tasks in Study 1 and Study 2

	Study 1	Study 2
Brainstorming	0.33	0.72
Group Matrix Reasoning	0.74	0.80
Group Moral Reasoning	0.36	0.10
Plan Shopping Trip	0.57	0.48
Group Typing	0.68	0.61
Eigenvalue	2.17	2.21
Coefficient of congruence		0.93

* Correlation is significant at p<.05, two-tailed ** Correlation is significant at p<.001, two-tailed

A regression analysis using *c* and average individual intelligence confirmed this predictive correlation between *c* and future test performance, but not for the average intelligence score -- although the researchers acknowledge a "moderate" correlation, in some tests, between average intelligence and maximum intelligence scores, and task performance.

In the second study, working with over 150 groups of 2 to 5 members each, researchers sought to replicate the results. Results once again provided confirmation of the existence of a "first factor" (the putative *c* factor), that accounted for over 30% of the performance score variance. The researchers concluded that "a one-factor model is the best fit for the data from both studies."

So then, how is this mysterious "group intelligence factor" accounted for, that is, what is causing it? Woolley *et al* were able to isolate three key factors in emergent group intelligence: 1) *social sensitivity* (as measured by the "Reading the Mind in the Eyes" test), 2) the *variation in speaking turns* (as measured by 'sociometric badges' worn by a subset of the groups), and, 3) the *proportion of females* in the group. The second factor was found to be *negatively* correlated with *c* (the more one or two members dominated the group, the lower the group's collective intelligence). The last factor appears to be "largely mediated by social sensitivity because (consistent with previous research) women in our sample scored better on the social sensitivity measure than men."

Results of OLS Regression Analyses of Effects of Percent Female, Average Member Social Sensitivity and Speaking Turn Variance on Collective Intelligence (n=46 groups)

	Collective Intelligence (c)			
	Step 1	Step 2	Step 3	Step 4
Number of members	0.09	0.19	0.21	0.28
Percent Female		0.40*	0.26	0.25
Social Sensitivity			0.37*	0.33*
Speaking Turn Variance				-0.27
F	0.28	3.01	3.91*	3.87*
R^2	0.08	0.16	0.27	0.34
change R^2		0.08	0.11*	0.07

* Coefficient is significant at $p<.05$, two-tailed

The researchers state that "these results provide substantial evidence for the existence of *c* in groups, analogous to a well-known similar ability in individuals. Notably, this collective intelligence factor appears to depend both on the composition of the group (average member intelligence), and on factors that emerge from the way group members interact when they are assembled (e.g., their conversational turn-taking behavior)."

The research team** wonders if this information could be used to raise the intelligence of groups — a far easier (faster) task than raising individual intelligence. By measuring the effects of specific interventions on *c*, researchers will be able to predict the effects of those interventions on a variety of tasks. This in turn will contribute to the establishment of a new "science of collective performance".

* The paper abstract: '**Evidence for a Collective Intelligence Factor in the Performance of Human Groups' (10.1126/science.1193147)**

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Top diagram (types of collective intelligence): Generozo; CC – by – sa 3.0

Data charts: from SOM, the authors, cited paper (above)

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Nature Walks Improve Learning More than City Walks



Environmental psychology researchers at the University of Michigan have confirmed what many have long-suspected: spending time in a natural setting is good for the brain (at least for its ability to retain important information). Study subjects learned better after a walk in nature than after a walk in a dense urban setting. Conversely, previous studies (also conducted by Marc Berman *et al*) have shown that living in a dense urban environment actually impairs cognition and self-control.

It is believed that urban environments present an excess of stimuli, information and choices to our brains, leaving them fatigued. This spate of recent research comes at a time in human history when (for the first time) a majority of people live in cities.

Researchers note that our harried urban lives afford us little time for mental refreshment, and so we take numerous small breaks ("micro moments"). But these do not provide the benefits that longer breaks provide–in fact, they make our brains more fatigued in the long run. But research shows that a walk in Nature can restore our brains and improve learning.



Greater Tokyo Area, the world's most populous urban area with about 35 million people.

Cities constantly present our brains with a diversity of new experiences. Unlike the diversity in Nature, however, these urban experiences can be disruptive, stressful and often accompanied by negative emotional states. These effects tend to impair basic cognitive functions.

Studies conducted at the University of California, San Francisco on rats (perhaps not ironically), showed that new experiences were accompanied by new neural firing patterns in the brains of the rodents. However, only when the rats were allowed to take a break from these new stimuli were they able to process the experiences (i.e., the new neural patterns) in a way that allowed for retention of the experience.

The non-stop stimuli of city life may be inadvertently promoting short attention spans; there is simply too much going on vying for our ever-limited attention.



World map showing percent of population living in an urban environment.

In fact, according to environmental psychologist Stephen Kaplan (also of the Univ. of Michigan), attention is the crucial mediator between green space and psychological benefit. Urban environs place continuous demands on what's known as *directed attention*. Natural environments, on the other hand, allow our directed attention to rest. What's more, they engage a different form of attention that he calls *fascination.* This involuntary form of attention improves mood, directed attention and cognition.

Kaplan's research has led him to formulate his theory of *restorative environments.* These restorative settings have more biodiversity than a typical urban "green space" or city park, and they certainly provide stimulation–but not stimulation that provokes a negative emotional response. Simply put, this type of environmental stimuli allows our brains to relax. His theory is also known as attention restoration theory (ART).

An earlier study (Fuller et al) exploring the relationship between one's mental health state (an effect termed *reflection,* i.e., the act of gaining perspective, clearing one's head, etc.) and perceptions of green space diversity, showed a positive correlation between this reflection capacity and greens space biodiversity.*

It seems that the diversity in natural settings provides, or perhaps triggers, this different form of attention by providing a more interesting, but less stress-inducing, field of perception. Biodiversity, even in an urban environment, plays a key role in proper mental functioning.

Other studies of city dwellers have shown a positive correlation between having a view of trees and personal happiness. The field of environmental psychology has its roots in ecological psychology (founded in 1947 by Roger Barker) which sought to reveal how social settings influence behavior.



Environmental psychology studies such as these are now prompting urban designers to plan with Nature in mind (more green spaces, parks, bike trails) and to preserve natural features — such as trees — wherever possible. Organizations have emerged to specifically address the psychological needs of urban dwellers.

One such org, PPS (Project for Public Spaces), is a New York City based nonprofit (founded in 1975 by Fred Kent) that works to improve public spaces, particularly parks, civic centers, public markets, down towns, and campuses

Author's Note: I am fortunate to live in a moderate-sized city (Seattle) that provides rich cultural experiences AND easy access to natural environs; our "emerald city" has over 360 parks within its borders. In some of these, like Discovery Park and the Arboretum, one can actually get lost in, for a time.

*** But no correlation was found between reflection and bird and butterfly diversity. In general, the study found that more biodiverse and more complex green spaces better permitted personal reflection and provided more restorative benefit than did less diverse areas.**

top photo: The Tuckerman Ravine trail at Mount Washington (New Hampshire), Ws47, on wikipedia.org; Creative Commons Attribution-Share Alike 3.0 Unported license.

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