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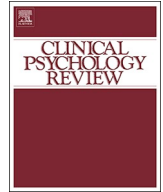
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## Scaling up and scaling out: Consilience and the evolution of more nurturing societies

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### HIGHLIGHTS

- Describes coercive and nurturing environments and their impact on health.
- Reviews interdisciplinary evidence to identify consilience on targets of change.
- Advocates prosocial values and reformed contingencies in all sectors of society.
- Documents how most psychological and behavioral problems can be prevented.

### ARTICLE INFO

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### ABSTRACT

This paper argues that diverse disciplines within the human sciences have converged in identifying the conditions that human beings need to thrive and the programs, policies, and practices that are needed to foster well-being. In the interest of promoting this view, we suggest that this convergence might usefully be labeled “The Nurture Consilience.” We review evidence from evolutionary biology, developmental, clinical, and social psychology, as well as public health and prevention science indicating that, for evolutionary reasons, coercive environments promote a “fast” life strategy that favors limited self-regulation, immediate gratification, and early childbearing. However, this trajectory can be prevented through programs, practices, and policies that (a) minimize toxic social and biological conditions, (b) limit opportunities and influences for problem behavior, (c) richly reinforce prosocial behavior, and (d) promote psychological flexibility. The recognition of these facts has prompted research on the adoption, implementation, and maintenance of evidence-based interventions. To fully realize the fruits of this consilience, it is necessary to reform every sector of society. We review evidence that free-market advocacy has promoted the view that if individuals simply pursue their own economic well-being it will benefit everyone, and trace how that view led business, health care, education, criminal justice, and government to adopt practices that have benefited a small segment of the population but harmed the majority. We argue that the first step in reforming each sector of society would be to promote the value of ensuring everyone’s well-being. The second step will be to create contingencies that select beneficial practices and minimizes harmful ones.

### 1. Introduction

Decades of progress in behavioral science have led to a realization of the next steps that are needed to evolve societies in which an increasing proportion of people live productive and caring lives (O’Connell, Boat, & Warner, 2009). We argue that the accumulated evidence in the human sciences converges to show both the environmental conditions and the behavioral repertoires that maximize human well-being. Then, we briefly describe the ways that this knowledge is being used to

increase the proportion of the population that is thriving. Progress is being made in disseminating interventions so that an increasing, albeit small, proportion of the population is being reached. However, evolving societies whose goal is to support everyone’s well-being will require more than the dissemination of existing interventions. We need to bring about fundamental changes in the values and practices of every sector of society.

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## 2. The nurture consilience

The biologist E. O. Wilson has encouraged us to seek consilience in our understanding of the natural world (Wilson, 2012). Consilience involves “the linking of facts and fact-based theory across disciplines to create a common groundwork of explanation.” We submit that consilience has emerged in the human sciences to such an extent that we have a framework for evolving a society that ensures the well-being of a much larger proportion of the population.

Findings in diverse disciplines converge to enable us to describe the conditions that nurture human well-being and the conditions that undermine it. Both as individuals and as a species, humans are most likely to thrive when they live in what we have labeled “nurturing environments” (Biglan, 2015; Biglan, Flay, Embry, & Sandler, 2012). These environments have at least four features. They (a) minimize toxic biological and social conditions, (b) limit opportunities and influences to engage in antisocial or otherwise harmful behavior, (c) richly reinforce all sorts of prosocial behavior, and (d) cultivate psychological flexibility. People who live in these environments develop values and skills that favor nurturing the well-being of those around them. They demonstrate psychological flexibility in the sense that they pragmatically and resiliently do what works for them to advance the well-being of themselves as well as those around them. In the past, these four features have largely been analyzed as distinct processes rather than being seen as interconnected influences in human development. Here we provide a brief overview of this consilience and cite the diverse disciplines and literature that underlie this point of view.

### 2.1. Evolutionary theory

Evolutionary theory provides perhaps the most important foundation for this consilience (Wilson & Gowdy, 2013; Wilson, Hayes, Biglan, & Embry, 2014; Wilson & O'Brien, 2009; Wilson, O'Brien, & Sesma, 2009) and is relevant to every aspect of life (Wilson, 2019). Evolutionary theory shows us that we can understand the change over time in all living things in terms of variation, selection, and some form of reproduction or retention. This is as true for changes in the behavior of individuals and organizations as it is for changes in the physical characteristics of organism. It explains the change over time in genetic, epigenetic, behavioral, and symbolic/verbal processes (Jablonka & Lamb, 2014; Wilson et al., 2014). Epigenetics are the biological processes affecting which genes are expressed into proteins, or in other words “turned on and off”, which is a function of environmental interaction (O'Donnell & Meaney, 2020). An applied example is the long-term epigenetic changes in the intervention group receiving the Good Behavior Game that were observed in the brain-derived neurotrophic factor gene, which is related to impulsivity and aggression (Musci et al., 2014).

At the same time, selection can occur at multiple levels (Henrich, 2004; Turchin, 2015; Wilson & Wilson, 2007). For example, individuals' behavior may be selected by the consequences to the individual, but selection can also occur at the level of groups. The cooperative tendencies of humans are thus seen as the result of the greater likelihood of survival of cooperative groups as compared to less cooperative groups (Wilson, 2019). Virtually everything that we take for granted in the modern world—from airplanes to medicine—is the result of cooperation among unrelated individuals, and effective cooperation requires nurturing behavior among group members.

What we have learned about the psychological, behavioral, and physical health of humans can all be understood in terms of evolution. An evolutionary framework can organize our thinking about the human condition in ways that not only reduce individual suffering but also lay the foundation for the evolution of a society that does a better job of ensuring the well-being of all of its members.

### 2.2. Coercion and fast and slow development

We can explain differences in developmental trajectories as a function of the quality of the young person's social environment (Ellis et al., 2012; Ellis & Bjorklund, 2012). “Fast life” versus “slow life” outcomes among humans are evolutionary adaptations of humans to two distinct social and ecological contexts. Environments with high levels of conflict and stress promote a “fast life” trajectory that involves a lack of self-regulation, a high level of risk-taking, the development of antisocial and violent behavior, academic failure, and a greater likelihood of depression, as well as the development of inflammatory processes that contribute to metabolic syndrome, diabetes, cardiovascular disease, and ultimately premature death (Ellis et al., 2012; Ellis & Bjorklund, 2012; Miller, Chen, & Parker, 2011).

Behavior analysis has provided an in-depth understanding of the nature of the environments that lead to “fast life” developmental trajectories (Patterson, Reid, & Dishion, 1992; Sidman, 1989). In highly stressful environments, coercive interactions become common. Each person's aversive behavior is reinforced by the cessation of the other's aversive behavior, reinforcing the use of this behavior as a means to resolve conflicts. Research has shown that chronically coercive interactions in families predict the development of the just-mentioned constellation of psychological, behavioral, and health problems (Dishion, Patterson, & Kavanagh, 1992; Granic & Patterson, 2006; Miller et al., 2011; Van Ryzin & Dishion, 2013). The consilience of this analysis with evolutionary theory is further shown by the fact that children on this trajectory are more likely to have children at an early age (Ellis et al., 2012). Apparently, the fast life strategy has had value in our evolutionary history; in a threatening world, you should have your babies early or you may not have them at all.

On the other hand, nurturing environments, as defined above, promote a “slow life” developmental pathway in which children develop skills in self-regulation, cooperation, and resilience, all of which enable children to learn and contribute to the well-being of society. This pathway has been labeled “slow” because it involves a longer period of time for the person to develop the prosocial skills needed to function as cooperative member of society. This also entails delaying procreation.

The concept of self-regulation is a particularly important aspect of so-called “slow” development. Nurturing environments provide numerous occasions in which children are reinforced for delaying immediate gratification or inhibiting impulsive behavior (Murray, Rosanbalm, Christopoulos, & Meyer, 2019). These key self-regulatory skills are also at the core of constructs such as psychological flexibility (Hayes, Luoma, Bond, Masuda, & Lillis, 2006) and delay discounting (Critchfield & Kollins, 2001; Odum, 2011). A more detailed description of these terms is outside the scope of this paper, but noting the overlap is important for the broad implications of interventions that can improve self-regulatory skills. Psychological flexibility and delay discounting have both been shown to be related to well-being, more effective functioning, and lower levels of a wide variety of psychological and behavioral problems and diagnoses (Amlung et al., 2019; Bickel, Jarmolowicz, Mueller, Koffarnus, & Gatchalian, 2012; Gloster, Meyer, & Lieb, 2017; Kashdan & Rottenberg, 2010; Lempert, Steinglass, Pinto, Kable, & Simpson, 2019; Levin et al., 2014; Levin, Haeger, Ong, & Twohig, 2018).

### 2.3. Clinical psychology

In many ways, research in clinical psychology has been foundational for understanding the basis of nurturance. Some of the earliest work in psychotherapy showed the beneficial effects of the therapists' empathy, genuineness and warmth (Carkhuff & Truax, 1965). Systematic desensitization (Wolpe, 1963) was a matter of creating conditions in which people could increase their comfort enough to approach stimuli they had been fearful of. Lewinsohn's work on depression (Lewinsohn, Biglan, & Zeiss, 1976) showed that depression could be alleviated by

increasing a person's contact with positively reinforcing contingencies.

More recently, evidence has accumulated that psychological “disorders” can be largely understood in terms of efforts to avoid threatening or aversive experiences (Hayes, Strosahl, & Wilson, 2016). Clinical research on the treatment of diverse disorders shows that when people are helped to become willing to experience, rather than avoid, psychological or physical aversive sensations and to pursue a set of chosen values, their pain diminishes and the meaning and joy in their lives is enhanced (A-Tjak et al., 2015; Atkins et al., 2017; Jiménez, 2012). Moreover, it appears that when people are encouraged to freely choose their values rather than adopt the values that they perceive others demand that they live by, they typically choose a set of prosocial values that involve caring relationships with others (Gagné, 2003; Sheldon, Arndt, & Houser-Marko, 2003).

#### 2.4. Prevention science

The importance of nurturance for human well-being is further supported by evidence from prevention science. Over the past forty years, a large body of evidence has accumulated about the family, school, and community interventions that can prevent the “fast life” developmental trajectory (Biglan, 2015; Biglan, Van Ryzin, & Hawkins, 2017; Biglan, Van Ryzin, Moore, Mauricci, & Mannan, 2019; Van Ryzin, Fishbein, & Biglan, 2018).

Preventive family interventions grew out of clinical work with children with behavioral disorders (e.g., Patterson, 1974). Parental behavior is important in affecting the intergenerational transmission of self-regulatory skills or deficits (Bridgett, Burt, Edwards, & Deater-Deckard, 2015). Leslie et al. (2016) describe sixteen family interventions that have been shown to prevent most of the common and costly psychological and behavioral problems. In schools, interventions such as PeaceBuilders (Embry, Flannery, Vazsonyi, Powell, & Atha, 1996), the Good Behavior Game (Embry, 2002; Kellam et al., 2011, 2012), Positive Action (Flay & Allred, 2003), and cooperative learning (Roseth, Johnson, & Johnson, 2008; Van Ryzin & Roseth, 2019; Van Ryzin, Roseth, & Biglan, 2020) result in reductions in “fast life” strategies and higher student investments in education, work, and positive lifestyles. This is especially true for the children exposed to the highest levels of neighborhood violence and victimization (Vazsonyi, Belliston, & Flannery, 2004).

All of these interventions reduce the use of aversive or punitive behavior, limit opportunities and influences for problem behavior, and increase positive reinforcement for diverse forms of prosocial behavior (Biglan et al., 2012).

#### 2.5. Social psychology

Research in social psychology lines up with this observation. Kasser (2006), Kasser, 2016; Sheldon & Kasser, 2008) has summarized extensive evidence that people generally embrace one of two sets of values. Consistent with the previously described analysis of fast and slow developmental pathways, values having to do with materialism—“I want to be rich, I want to be famous”—are more likely to be endorsed when people are living in threatening circumstances, where having wealth and fame may contribute to survival. However, people who adopt this constellation of wealth and status values have greater psychological and behavioral distress. On the other hand, in more nurturing circumstances, people are likely to endorse prosocial values that involve contributing to the well-being of others (Kasser, Ryan, Zax, & Sameroff, 1995).

#### 2.6. Public health

Public health is a system for enhancing the well-being of entire populations. It evolved out of efforts to control epidemic diseases like polio but has expanded to address the incidence and prevalence of

psychological and behavioral problems as well as physical health. Moreover, it focuses on the prevalence of *any* environmental condition that affects the incidence or prevalence of human problems, which can include the marketing of tobacco, alcohol, and unhealthy foods, poverty, or discrimination against groups (Biglan, Van Ryzin, & Westling, 2019).

As our recent experience with the novel coronavirus COVID-19 has shown, the public health framework is vital to any effort to improve human well-being because it demands that we monitor and affect the incidence and prevalence of problems in entire populations, rather than simply focusing on the well-being of individuals (Biglan, 2015).

#### 2.7. Economics

It will be impossible to increase the prevalence of nurturing environments if we do not understand the evolution of economic conditions and their impact on human well-being. In the United States, and increasingly around the world, we have evolved a form of capitalism that makes the maximization of profits the singular goal of business enterprises (Biglan, 2020a). The well-being of employees, customers, and communities has been subordinated to the pursuit of profits. This is the result of extensive and stealthy advocacy for the theory that the individual and corporate pursuit of economic gain will necessarily benefit others (Mayer, 2016). This way of thinking has permeated every sector of society. Our ability to evolve societies that nurture the well-being of every person will be limited if we do not reform the values and priorities of each sector of society (Kasser, Cohn, Kanner, & Ryan, 2007).

#### 2.8. A word about terminology

Although there are many other terms that might be used to communicate the vast, interdisciplinary network of findings that help us understand what humans need to thrive, we have labeled this synthesis the “Nurture Consilience” based on our own work on this issue (Biglan, 2015; Biglan et al., 2012; Komro et al., 2011). We acknowledge that there are other ways that one could refer to this consilience.

It would be valuable for the scientific community to agree on a label. There is a strong need to bring diverse disciplines together around a shared understanding of what humans need to thrive and how we can evolve societies that support their well-being. The labeling of this consilience is vital to communicating its importance. If the scientific community intends to make use of this knowledge to evolve societies in nurturing directions, it will be important to get not only the scientific community, but societies as a whole to understand and embrace this analysis. Thus, a first step in advancing this understanding would be to settle on a label for this effort.

### 3. Scaling up and scaling out

Although it has not been defined with precision, prevention science has developed a concept known as *scaling up* that refers to the process of moving from an individually focused intervention to the application or dissemination of that intervention to affect an entire population. As prevention science has accumulated a large array of tested and effective interventions, the field has increasingly turned to the question of how those interventions could be so widely applied that they affect entire populations. Examples of these efforts include (a) the implementation of the PAX Good Behavior Game in more than 40,000 elementary school classrooms worldwide, which grew out of the studies by Sheppard Kellam and colleagues (Kellam et al., 2012), which showed the long term benefit of the Good Behavior Game; (b) the efforts of Wilson, Atkins, and Hayes to disseminate the Ostrom Principles (Wilson, Ostrom, & Cox, 2013) by integrating behavior change techniques from clinical psychology (Polk & Schoendorff, 2014), to help small groups function more effectively (Atkins, Wilson, & Hayes, 2019);

(c) the extensive work that is being done to disseminate clinical interventions derived from Acceptance and Commitment Therapy (Hayes et al., 2016) that focus on promoting psychological flexibility (Brown, Glendinning, Hoon, & John, 2016; Hayes, 2019; Tol et al., 2020); and (d) our own efforts to increase the prevalence of nurturing environments by enhancing the developmental contexts of children and youth (Biglan, 2020a; Biglan, Van Ryzin, Moore, et al., 2019; Biglan, Van Ryzin, & Westling, 2019; Van Ryzin et al., 2020; Van Ryzin, Roseth, Fosco, Lee, & Chen, 2016).

Although the emphasis in this work has generally been on *scaling up* to affect an increasing proportion of the population via a single channel (e.g., schools, the health care system, the mental health system, the criminal justice system), there is another facet of dissemination that might be labeled *scaling out*. This involves creating an impact in sectors of society other than the one in which the intervention or practice originated. Aarons, Sklar, Mustanski, Benbow, and Brown (2017) suggest three variants of scaling out; (a) targeting the same population as the intervention was developed for, but using a different delivery method; (b) targeting a different population, using the same delivery method; (c) changing both target population and delivery method. Our use of the term “scaling out” is clearly related, but also more general in that we advocate spreading practices that lead to similar outcomes - increased levels of nurturance - across all sectors of society.

For example, the rapid expansion of the PAX Good Behavior Game to elementary schools around the USA and around the world has recently begun to be accompanied by attention to how the generic practices of PAX could be useful in families, the criminal justice system, and business (Johansson, Biglan, & Embry, in press). The same evidence-based kernels that work in the classroom, for example, may also work in families, after-school settings, and community settings serving children (Embry & Biglan, 2008; E. P. Smith, Faulk, & Sizer, 2016; Smith, Osgood, Oh, & Caldwell, 2018; E. P. Smith & Bradshaw, 2017; Szabo, Richling, Embry, Biglan, & Wilson, 2020).

Evolving societies in which the vast majority of people are experiencing nurturing conditions requires both types of scaling. Because the need for scaling up is increasingly understood and is progressing, we will focus here on the issue of scaling out.

#### 4. The impact of free market advocacy on society

The principles emerging in the above-described consilience are increasingly accepted within the human sciences. However, this view of life is far from the dominant understanding of the human condition in most sectors of society. Instead, the dominant view is that people are selfish maximizers and that society benefits from their having that orientation (Biglan, 2020a). Until that view is supplanted by the consilience we have described, it will be impossible to create the nurturing conditions that people need in every facet of their daily life. To achieve this shift and promote consilience, it is important to understand how free-market ideology has permeated every sector of society and how that has undermined not only human well-being but the conditions needed to nurture well-being.

Advocates of free-market theory used Adam Smith's metaphor of the invisible hand to promote the view that if everyone in the marketplace pursued their own economic well-being, it would benefit everyone. Smith gave the example of the baker who, in simply trying to make bread that would satisfy customers, is motivated to make better or cheaper bread, which then benefits everyone (A. Smith, 1776). There is some truth to this idea. Market competition selects innovative and frequently beneficial practices. However, in the hands of free-market advocates, the view has morphed into the belief that we will all be better off if everyone just pursues their own economic well-being without regard to the harm to others. The result has been that the primary consequence selecting organizational practices throughout society has been profit maximization, while government oversight has diminished along with consideration of the long term consequences of

business practices (Biglan, 2009).

In each sector of the economy, values having to do with wealth accumulation have tended to replace values having to do with concerns about others and one's community (Biglan, 2020a). This, in turn, favored the selection of practices that maximized individual wealth at the expense of general well-being.

##### 4.1. Business

Jane Mayer provides an excellent historical overview of the fifty-year advocacy for free-market economics that was conducted by a network of wealthy business people primarily in the U.S. (Mayer, 2016). It encouraged businesses to make the maximization of profits their singular goal. The appropriateness of this goal was propounded by the Nobel laureate in economics, Milton Friedman (1970). By 1997, the Business Roundtable, which includes the largest American corporations, formally adopted this principle (The Business Roundtable, 1997).

Advocates for free-market ideology called for minimum regulation of business and reduction in the size of government. Their success in minimizing regulation is shown by the many ways in which corporations are engaging in business practices that harm large proportions of the population. They include 480,000 people a year who die of smoking-related illness (Biglan, 2020e; Centers for Disease Control and Prevention, 2018), the opioid epidemic that has killed more than 350,000 people (Biglan, 2020b; National Institute on Drug Abuse, 2019), the marketing of unhealthy food that has created an epidemic of obesity and diabetes (Biglan, 2020c; Moss, 2013) and is shortening the life expectancy of children (Olshansky et al., 2005), the practices of the financial industry that resulted in the 2008 Great Recession (Lewis, 2010), and the failure to reduce greenhouse gas emissions in the face of scientific consensus on the dangers of climate change (Biglan, 2020a, 2020c).

##### 4.2. The healthcare system

During the time in which free-market advocacy came to dominate society, we have experienced a dramatic increase in health care expenses and a reduction in American's health. Most parts of the health care system have worked to maximize their profits. In the U.S., salaries of physicians have risen faster than inflation and are higher than in any other country (Daggett, 2017; Rampell, 2009). Health insurance company profits and executive salaries have increased dramatically in recent years (Herman, 2017; Small, 2017). The same is true of the pharmaceutical industry (Krantz, 2016). The over-prescription of opioids, anti-depressive medication, psychostimulants for children, and antibiotics has increased even as research documented the harm of such practices (Gotzsche, 2013).

Presently, the contingencies of reinforcement do not favor the actual health of the patients or the larger community. Atul Gawande provided an example of how a local healthcare system can be finely attuned to how well its practices are increasing revenues, while at the same time, being clueless about the impact of their practices on the health and well-being of the population (Gawande, 2009). Fig. 1 shows how a huge bureaucracy has evolved during the ascendancy of free-market advocacy and the accompanying reduction in American longevity. In short, the players in the health care system have selected practices that benefit them, but have ignored their impact on the nation's health (Reinhardt, 2019).

##### 4.3. Higher education

Colleges and universities are not acting in light of their impact on the prevalence of well-being. Over the past fifty years, business schools and law schools have educated a generation of MBAs and lawyers who embraced free-market theory and worked to help businesses maximize profits and shield them from government regulation and/or



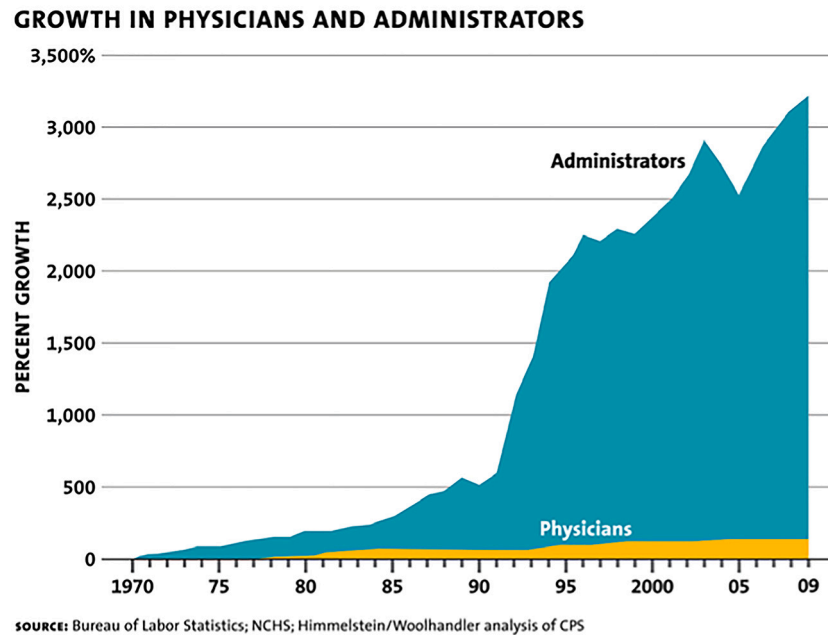


Fig. 1. The growth in physicians and administrators in health care.

accountability to their community or country (Biglan, 2020a). In keeping with developments in the rest of society, we see a dramatic escalation in university administrators' salaries (Vedder, 2016) at the same time that student debt is soaring (O'Day, 2019). In addition, the contingencies of many private enterprise higher-education entities were deliberately designed to take advantage of students.

More generally, higher education is not educating the workforce that is needed to help communities and sectors of society advance nurturance (Grant, 2016). Traditionally, higher education has made great contributions to the development of technology, medicine, and basic scientific understanding. However, the problems we face now will not be solved by new technologies, but by the broad application of the science of human behavior. The behavioral sciences receive less than 10% of federal funding for research (Biglan, 2020a), yet it is the science of human behavior that has the knowledge to educate a generation of young people to acquire the skills and competencies to evolve more nurturing societies.

#### 4.4. Criminal justice

The U.S. has the highest level of incarceration of any country in the world ("List of countries by incarceration rate," 2019). Incarceration has intergenerational effects. Our punitive system undermines family well-being by incarcerating people who could be breadwinners for their family and by traumatizing the children of adults caught up in the system (Morsy & Rothstein, 2016). The punitive system results in high levels of recidivism, and this system remains in place despite the fact that more nurturing practices have been found to be far more effective (Lipsey, Wilson, & Cothorn, 2000).

This situation is not entirely due to free-market advocacy. However, the privatization of prisons encouraged by free-market advocates has done nothing to improve the system (Simon, 2016). The private correction industry has become a major political lobbying entity, which helps to maintain our punitive and ineffective criminal justice system. Moreover, economic policy has increased poverty, which contributes to crime.

#### 4.5. The political system

Behavioral scientists have traditionally been loath to get involved in politics, at least in their role as scientists. However, our political system consists of a set of cultural practices whose evolution can be understood in the same way that other aspects of society can. Over the past forty years, policymaking has increasingly come under the control of interests that make policies for their own benefit, while often diminishing the well-being of many others ("Crony capitalism," 2019; Aligica & Tarko, 2014; Khatri, Tsang, & Begley, 2006). This too is a matter of selection by consequences. Wealthy individuals and corporations have invested heavily in the selection of political leaders who would act in their interests. That their investment has reaped benefits is documented by Fig. 2, which shows the increase in income of the top 1% of households (Alvaredo, Chancel, Piketty, Saez, & Zucman, 2017) compared to the bottom 50%. Advocacy for policies that benefit the wealthy has been richly rewarded and it is undermining our democratic system.

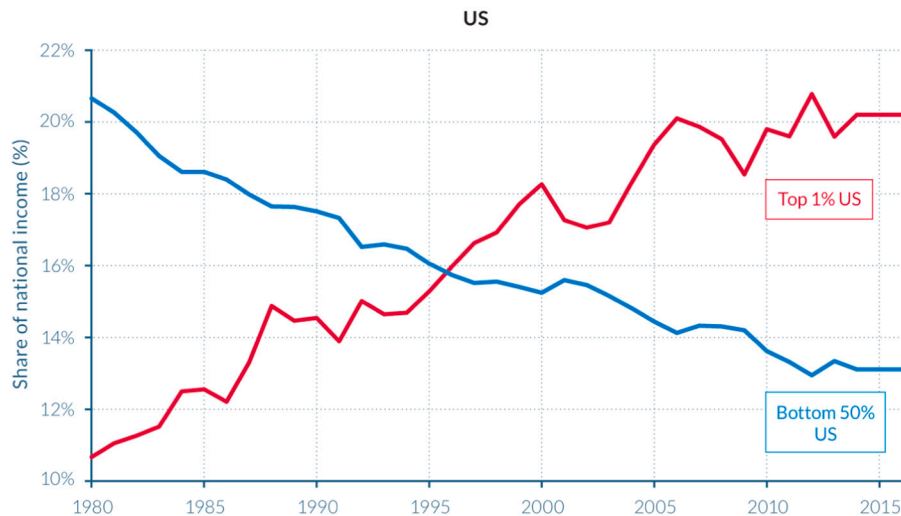
The impact of public policy on general well-being needs to be routinely scrutinized and widely reported. We also need to articulate the contingencies that have allowed a small group of the very wealthy to have such influence on policymaking, and we need to support research and practical action on how we can change those contingencies.

### 5. Evolving more nurturing societies

Evolving societies that advance nurturing conditions will require three things. First, we need to promote prosocial values throughout society. Second, we need to evolve a system in which every sector routinely analyzes the degree to which it is advancing the general well-being. Third, we need to create contingencies that select practices on the basis of their impact on well-being.

#### 5.1. The promotion of prosocial values

An airline passenger does not need to know anything about the science of aviation in order to enjoy the benefits of that science. The same cannot be said about the science underpinning the Nurture Consilience. The beneficiaries of effective clinical and preventive interventions adopt an orientation that is consistent with that scientific



Source: WID.world (2017). See [wir2018.wid.world/methodology.html](http://wir2018.wid.world/methodology.html) for data series and notes.

In 2016, 12% of national income was received by the top 1% in Western Europe, compared to 20% in the United States. In 1980, 10% of national income was received by the top 1% in Western Europe, compared to 11% in the United States.

Fig. 2. Share of US national income in the hands of the top 1% vs bottom 50%.

consensus. They reduce their use of coercive behavior in their relationships with others, they become more compassionate toward themselves and others and become more oriented toward prosocial values and outcomes. Much of the spread of these values and behaviors is resulting from the scaling up of these interventions. However, it will be further advanced if the leaders of each sector of society are explicit in their adoption of these values, goals, and practices.

In a kind of reverse engineering of the free market ascendancy, we need to influence the major sectors of society to understand and promote the Nurture Consilience. We can learn from the free-market advocates who funded programs promoting their views in major universities and through the cultivation of careers in academia, business, and the media of people who were skilled at promoting business-friendly views (Mayer, 2016). Similarly, behavioral scientists and practitioners need to educate a generation of people who understand and can advocate for the science of human well-being and its implications for every sector of society. We need advocates in medicine, business, education, entertainment, and media who are skilled in explaining the benefits of values, goals, norms, and practices that advance the general well-being.

Although we are arguing that research shows the benefits of creating nurturing conditions, we are not arguing that science can dictate our values. In other words, we are not saying that prosocial values are the one TRUE set of values. You might explain to a person the benefit to the general well-being of prosocial values, but that person would be free to respond that they understand that prosociality, as opposed to self-centered values, will benefit a larger proportion of society, but they still want to have a society in which some people are able to amass huge wealth, even if others' well-being is diminished.

Although we cannot claim that science proves that prosocial values are the one true set of values, we can advance these values by educating people about their benefit. The evidence is that when we work to improve the well-being of others, it benefits all of us (Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008; Fredrickson & Joiner, 2018).

One thing that could contribute to a rebirth of prosocial values in American society would be an effort to close the divide between the secular and religious communities. As American society has become more secular, a gulf between religious and secular communities has arisen (Putnam & Campbell, 2012). The promotion of prosocial values would be facilitated if secular and religious organizations that share the values of ensuring everyone's well-being came together to promote

these values. In sum, we believe that scaling up and scaling out the framework of the Nurture Consilience across all sectors of society will contribute to the wealth, safety, health, freedom, and political stability of any nation that makes use of this knowledge.

## 5.2. Monitoring the impact of each sector on wellbeing

Using public health practices, we can readily measure the degree to which any given practice is (or is not) harming people. We already do this for cigarettes, guns, alcohol, unhealthy foods, and some aspects of economic policy. We have systems for monitoring psychological, behavioral, and physical health as well, but they are generally not available at the level of communities and are not linked to the impact of public policy and organizational practices to the extent that they need to be.

Consider what could happen if every sector of society examined how its practices were affecting well-being. In the healthcare sector, this would consist of health care providers and communities monitoring the well-being of the entire population and pinpointing practices that do or do not contribute to improved public health (Biglan & Embry, 2013). Careful monitoring of the well-being of the population would enable a business to identify which of its practices affect population well-being; examples include the degree of well-being of its employees, the marketing of unhealthy products, and support of the business community for the private and public sector efforts to make effective preventive interventions widely available. The criminal justice system could be charged with monitoring the rate of juvenile and adult crime, the rate of recidivism, as well as the harm to children who are affected by parental involvement in the system. Such data would direct their attention to these issues and lay the groundwork for selecting strategies to move these numbers in the right direction.

Schools are already tracking the academic and, to a lesser extent, the social development of students. To the degree that they do, they are already in a position to use the data to select increasingly effective practices. In particular, attention is needed to the extent to which schools are reducing disparities in academic and social development. Higher education could pay greater attention to whether it is training people who have the skills to promote the evolution of greater nurturance. It should also attend to how well it is promoting the success of poor or minority students, and the degree of indebtedness of students. We can also assess the degree to which news and entertainment media

are contributing to the promotion of nurturance or are increasing division, hate crimes, and false beliefs.

Finally, there is government. One of the most important things government can do is increase the use of effective monitoring systems. Most of the data on population well-being gives us information at the national or state level. Few communities have accurate and timely data on the psychological, behavioral, and physical health of its communities. Our goal needs to be to have such data for every community so that communities pay greater attention to well-being and can evolve increasingly nurturing practices. If this seems well beyond what is possible, we would simply note that the performance of our economy has long been tracked at the community level and that the data have been used to guide policymaking. Why should we not have similar data on the well-being of the people in our communities?

### 5.3. Creating contingencies that select beneficial practices

As people in each sector come to understand the Nurture Consilience, they can begin to advocate for practices in each sector that improve the general well-being. Armed with accurate and timely data on population well-being, it will become possible for each sector of society to select better and better policies and practices. In every case, it will be a matter of creating consequences that select beneficial practices and eliminate harmful ones.

Let's start with some business practices that are clearly harmful to a large proportion of the population—the marketing of unhealthy food and substances. Progress has been made in curtailing the marketing of tobacco to young people, but alcohol and unhealthy food continue to be widely marketed to young people (Biglan, Van Ryzin, & Westling, 2019). Moreover, the public health system has failed to prevent the marketing of vaping products to young people.

Many of the efforts to prevent these harms have focused on stopping specific forms of marketing such as the use of billboards to promote tobacco use. However, a much more effective strategy would be to simply tie the success of companies in marketing harmful products to young people to the companies' profits. We can assess the proportion of young people who begin using any specific product—a brand of cigarettes, alcohol, or sugar-sweetened beverages for example. Indeed, Pierce, Gilpin, and Choi (1999) were able to estimate the percent of youth who would begin smoking Camel cigarettes or Marlboro cigarettes. They were also able to estimate the number of those youth who would eventually die of smoking-related illness due to each of these brands. Using such methods, it would be possible to fine a company for every percent of the youth population that is using a specific product. If the fines were set so that they confiscated all of the profit from that marketing, it would curtail such marketing far more successfully than any prohibition on a specific form of marketing (Biglan, 2020a).

Contingency management can also select beneficial business practices. In the business sector, there are already two movements to reform business practices in the direction of a focus on well-being. The Conscious Capitalism movement (Mackey & Sisodia, 2013) and the B Corp movement (Loewenstein, 2013) are both advocating that businesses evaluate their practices in terms of their impact not only on investors, but on employees, customers, suppliers, and society as a whole. Even the Business Roundtable has abandoned its position that the only goal of a corporation should be to maximize profits. Instead, it recently articulated the principle that businesses should benefit all of these constituencies (Gelles & Yaffe-Bellany, 2019).

In health care, practices would increasingly be selected by their impact in improving health, rather than only curing illness. Policy could be adopted that makes system funding contingent on reductions in the incidence and prevalence of psychological, behavioral, and physical health disorders. This would motivate these organizations to fund the kind of family and school preventive interventions that we described above. It is already the case that a number of accountable care organizations and state Medicaid authorities are investing in school-based

interventions such as the Good Behavior Game because of its proven benefit in preventing substance use, depression, and other expensive conditions.

Higher education needs to train MBAs and lawyers who understand and promote the importance of nurturing conditions for health and societal well-being. We need more people who are trained to disseminate and implement the treatment and prevention programs that can significantly improve health. Traditionally, educational priorities have been selected by government and private funding and by requirements for obtaining professional credentials. To the extent that an increasing proportion of the leaders of each sector are focused on advancing well-being, they will implement contingencies to increase the preparation of a new generation of people who are committed to advance nurturance.

The criminal justice system needs to select practices such as prosecution, incarceration, and probation on the basis of their impact on crime and recidivism. If we take seriously the idea that the criminal justice system has responsibility for the total rate of crime, that system will need to invest more heavily in prevention together with other sectors in society. Law enforcement will need to work with health care, human services, and education to support and promote practices in those areas that have proven benefit in preventing crime (Biglan, 2015).

## 6. The need for a grand coalition

To fully accomplish the scaling up and scaling out that we propose, we need a coalition of organizations in society pursuing goals that are consistent with the Nurture Consilience. For example, we have advocacy organizations working to reduce harms such as tobacco and alcohol use. We have organizations working to reduce child poverty, organizations working to reduce discrimination, organizations working to improve health or cure or prevent specific diseases. There are organizations working on climate change, gun violence, and human trafficking. If there is measurable harm to human well-being, there is probably an organization working to address that harm.

Although these organizations work for the benefit of others, we believe that they are not as effective as they could be. Specifically, they are not well coordinated and do not speak with one voice. They need to see that each of the problems they are attempting to address is to a great extent the product of a society that has become dominated by the belief that each person should pursue their own economic well-being regardless of the harm to others. That belief, in turn, has contributed to high levels of poverty, economic inequality, and discrimination, as well as poorly regulated business practices. The Nurture Consilience provides a framework for creating a coalition among all the organizations that are working to advance human well-being. It would be bound together by prosocial values and the realization that each of the problems targeted by these organizations are products of the same set of non-nurturing conditions.

The Nurture Consilience can also improve the efficiency and cost-effectiveness of prevention. Many prevention efforts are directed at a single problem, despite the evidence that non-nurturing environments contribute to multiple problems (Biglan et al., 2012; Boles, Biglan, & Smolkowski, 2006). The result is a plethora of narrowly focused prevention programs. For example, schools have separate programs on bullying, alcohol, tobacco, drugs, suicide, trauma, depression, and obesity. All of these problems are made more likely by stressful environments, which are, in turn, made more likely by poverty, economic inequality, discrimination, and harmful marketing (Van Ryzin et al., 2018). Evidence from universal prevention programs like the Good Behavior Game shows that a comprehensive elementary school program to reduce punishment and threat, limit opportunities and influences to engage in problem behavior, and richly reinforce diverse forms of prosocial behavior can generate clearly measurable benefits across a broad array of behaviors many years later (Kellam et al., 2011).

The full benefit of what we have learned will not be realized unless



we also adopt public policy that has the potential for much deeper, more substantial, and sustainable change. For example, there is extensive evidence that a wide range of psychological and behavioral problems result from poverty and economic inequality (Hair, Hanson, Wolfe, & Pollak, 2015; Jachimowicz et al., 2020; Patel et al., 2018; Wilkinson & Pickett, 2017; Yoshikawa, Aber, & Beardslee, 2012). There are at the same time policies such as the earned income tax credit or universal basic income, that can significantly improve well-being and prevent problem development (Braga, Blavin, & Gangopadhyaya, 2019; Calnitsky & Gonalons-Pons, 2020; Hoynes, 2019; Widerquist, 2019).

### 6.1. Advocacy by behavioral scientists

This last point is a good example of why behavioral scientists need to play a leadership role in the scaling up and scaling out of the framework for the Nurture Consilience. Traditionally, we have published papers in academic journals and hoped that somehow our knowledge would affect actual policy and practice. However, it has become clear that changing practice in society itself requires research *and* action. The emergence of the field of dissemination and implementation (Fagan et al., 2019) is one indication of this trend.

Much of dissemination and implementation work is focused on getting evidence-based practices widely adopted, which is very important. However, it is also important that the behavioral science community speak with one voice in public discussion and with policymakers. To the extent that opinion leaders and policymakers throughout society come to believe that human well-being is fostered by nurturing conditions, there will be greater support for the policies and programs that are needed. The recent work of the National Prevention Science Coalition to Improve Lives in conducting Congressional briefings and writing op-eds is a good example (National Prevention Science Coalition to Improve Lives, 2019).

## 7. The implications of this analysis for other countries

Admittedly our analysis has been U.S.-centric. However, we think that at the very least it is a cautionary tale for the rest of the world because free-market theory and policy have been adopted in so many places. For example, Sweden, a country known for its success in nurturing the well-being of most people (Lakey, 2016), has since the early 1990s quite rapidly moved from a welfare system almost completely predominated by the public sector, to allow for the establishment of private for-profit providers and privatization of public operations, funded by taxes and pre-set rates of reimbursement. Several welfare areas were opened up for market competition in a similar manner. These reforms originated from the 1980s emerging Swedish right-wing think tanks, inspired by the governments of Reagan and Thatcher (Svallfors & Tyllström, 2017). The Swedish right-wing political parties are all in favor of the current system with unregulated profits in the welfare sector, even though most of their voters don't agree with this position (Svallfors & Tyllström, 2017).

Evaluations of the changes in Swedish school systems have shown increased segregation between schools in terms of students' socio-economic status, ethnicity and performance (Böhlmark, Holmlund, & Lindahl, 2016; Holmlund et al., 2014), while average performance has not increased (Hennerdal, Malmberg, & Andersson, 2018; Hinnerich & Vlachos, 2017). Similarly, market competition in the Swedish health care system has not produced discernible benefits (Anell, 2015; Hartman, 2011). Access to health care and medication has increased in geographical areas with denser population and higher income where patients usually have simpler issues, while it has decreased in low-populated areas and for more complex cases (Burström et al., 2017).

## 8. Evidence of cultural evolution

One might reasonably ask whether there is any evidence that such a

massive change in the cultural practices of societies can be achieved. Although the evidence is admittedly limited, there are several trends that are favorable to the cultural evolution we are calling for.

### 8.1. The spread of evidence-based programs and policies

A recent report from the National Academies of Sciences, Engineering, and Medicine (2019) enumerated examples of progress that has been made in promoting programs and policies that improve family, schools, and community support of child and adolescent development. Among the examples of progress being made in this area were

- Eleven federal efforts that range from pregnancy prevention to workforce development.
- Efforts in six states to systematically implement evidence-based family, school, and community interventions to prevent the development of child and adolescent problems.
- The growing field of research on the dissemination and implementation of evidence-based preventive interventions.
- Numerous evidence-based programs that have reached a significant portion of the population—beyond those receiving the programs in the context of a randomized trial. These included:
  - o Positive Behavioral Intervention and Support, a schoolwide system for promoting prosocial behavior, is used to some degree in more than 25,000 schools.
  - o The Nurse Family Partnership, a program proven to support positive development during pregnancy and the first to years of life, has reached 283,000 families (Nurse-Family Partnership National Symposium, 2019).

In addition, we queried the developers of other evidence-based programs that we were aware of were being widely implemented regarding their progress in disseminating their programs. Family interventions such as Parent Management Training Oregon (Forgatch, Patterson, & Gewirtz, 2013), the Incredible Years (Webster-Stratton, Reid, & Stoolmiller, 2008), and the Family Check-Up (Connell, Dishion, Yasui, & Kavanagh, 2007) are being implemented around the nation and around the world. The PAX Good Behavior Game (Embry, 2002) is being implemented in Canada, Estonia, Ireland, and Sweden, as well as in hundreds of schools in the USA.

There are also a number of organizations actively promoting nurture, though they may not use that label. For example, Blueprints was created as a registry of evidence-based interventions (Blueprints for Healthy Youth Development, 2020). It works to identify well-validated programs and to promote their adoption. The National Prevention Science Coalition was created to promote understanding and adoption of effective prevention programs (National Prevention Science Coalition to Improve Lives, 2019). It routinely provides briefings and consultation to Congressional staff and was recently instrumental in the creation of a Prevention Caucus in the U.S. House of Representatives. The Coalition of Behavioral Science Organizations was formed in 2018 to advance public understanding of the knowledge and methods of behavioral science. It is working to promote greater attention to reducing concentrated disadvantage in the United States. *Unleashing the Power of Prevention* (2020) is a national effort initiated by the social work community to promote evidence-based interventions to reduce the incidence and prevalence of behavioral health problems throughout the nation.

### 8.2. Scaling out

The just-described trends are largely examples of scaling up. However, we take the position that well-being will best be advanced if the nurturing conditions we describe come to characterize all of the sectors of society. To do this, the sectors that are currently and

explicitly promoting nurturance must influence the values and practices in other sectors. This is happening to some extent. As described above, segments of the business community are embracing more nurturing practices and segments of the criminal justice system are beginning to reduce punitiveness and adopt more nurturing and evidence-based rehabilitation practices (Biglan, 2020a). There are also efforts within the healthcare system to reform the system so that it prevents disease by ameliorating adverse conditions, rather than waiting until people have chronic diseases. There are also comprehensive community interventions that organize multiple sectors of the community to work together to address problems in family well-being and child and adolescent development. For example, in Colorado, marijuana tax revenue is funding the implementation of the Communities that Care (CTC) program in 48 communities. CTC brings together community leaders from the various sectors of the community, educates them about the risk and protective factors that contribute to multiple problems in adolescence, and assists them in implementing school and family interventions that can prevent problem development. CTC has been shown in multiple randomized trials to significantly reduce adolescent substance use and antisocial behavior, including violent behavior (Brown et al., 2014; Hawkins et al., 2008; Oesterle et al., 2018). Its implementation in Pennsylvania contributed to a significant reduction in juvenile crime throughout the state (Feinberg, Jones, Greenberg, Osgood, & Bontempo, 2010).

Other examples of scaling out abound in the U.S. and around the world. For example, the Centers for Disease Control and Prevention funded six projects to experimentally evaluate comprehensive interventions to reduce violence in neighborhoods of concentrated disadvantage (Kingston, Bacallao, Smokowski, Sullivan, & Sutherland, 2016). The rationale for this effort was that violence and other problems are multiply determined and a comprehensive intervention that involves schools, family services, the healthcare system, and community organizations is more likely to prevent problems.

In Switzerland, Andrew Gloster and colleagues have tested self-help interventions aiming to improve psychological flexibility (Hofer et al., 2018; Wersbe, Lieb, Meyer, Hofer, & Gloster, 2018), arguing that it could be a malleable factor for improving public health (Gloster et al., 2017). Based on similar theoretical underpinnings, self-help has been used to reduce psychological distress in Uganda (Tol et al., 2020). Globally, there is a worldwide movement to promote prosocial functioning of groups (Atkins et al., 2019) that is based on the principles that were articulated by Elinor Ostrom, who received the Nobel Prize in economics for her work (Wilson et al., 2013). One example of its application is to combat the spread of the Ebola virus in Sierra Leone (Honick, 2020). Overall, although the portion of the population being reached remains relatively small and the effective collaboration among sectors of the society is still limited, these are significant efforts to advance well-being by broad networks of people and organizations who are essentially on the same page about what human beings need to thrive.

## 9. Evolving societies that work for everyone

As discussed above, many sectors of society in the U.S. have come to be dominated by the belief that maximizing profits and income should be the major goal of people and organizations. This has fostered high levels of materialism throughout society at the same time that it undermined prosocial or communitarian values (Biglan, 2020a). If we are going to evolve societies that steadily increase general well-being, we need to reduce harmful practices and promote beneficial ones through the implementation of new selection pressures. These pressures can be promoted through the enhanced availability of information on general well-being and the subsequent application of consequences that reduce harm and promote well-being.

Foundational for this evolution is the scientific synthesis that we have labeled the Nurture Consilience. As scientific understanding of well-being and the conditions that contribute to well-being expands, we

will have an increasingly compelling basis for translating this knowledge into public policy. One of the most important strands in this effort is the scaling up of programs so that they reach an increasing proportion of the populace. However, as we hope we have made clear, even if evidence-based practices become widespread in clinical, human service, and school settings, we will have a limited impact on well-being if the other sectors of society—business, healthcare, criminal justice, higher education, and the political system—continue to be guided by the materialistic value that pursuing one's own well-being will always benefit everyone. In short, pursuing the well-being of every person needs to become the foundational value for every sector of society.

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## Declaration of Competing Interest

Anthony Biglan has a contract with the PAXIS organization to conduct research on the PAX system.

Magnus Johansson: None.

Mark Van Ryzin has a contract with the PAXIS organization to conduct research on the PAX system.

Dennis D. Embry owns the copyrights and trademarks associated with the PAX Good Behavior Game, and also wholly owns PAXIS Institute, which distributes and trains PAX Good Behavior Game and its derivative products and services. In the spirit of transparency, the public good, and the advancement of science, PAXIS Institute requires.

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