Health Behavior
A Darwinian Reconceptualization
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Introduction

The scientific study of health behavior is a field characterized by nonconsensus; it is not yet known what variables best predict successful outcomes. Contemporary models (such as the theory of planned behavior, the transtheoretical model, the health belief model, self-determination theory, and social cognitive theory) have been developed and refined through rigorous efforts to demonstrate linear causality among hypothetically related psychosocial variables. However, as practitioners testify, such models are problematic in that they are not fully explanatory and usually are manifest in only modest, transient improvement in health behavior. At best, these models explain a small amount of the variance in behavioral outcomes, usually around 10%–20%. The knowledge gained from these models about how the environment and learning experiences affect behavior are undoubtedly relevant considerations, as are social norms, cues to action, beliefs, attitudes, vicarious learning experiences, perceptions of susceptibility, opportunity, and readiness for change.

However, these psychosocial variables, though they are of interest, provide a very incomplete account of human failure to choose healthy behavior, despite near-optimal knowledge and resources. Faced with the most compelling of evidence, delivered by the most acceptable and motivating of means, human truculence often persists, yielding various unfortunate results, including relapse, morbidity, and premature mortality. Humans reliably act irrationally, in injurious ways both rapid and slow. Human nature is to be emotional, apparently self-destructive, defiant, contrary, indulgent, fickle, and seemingly incapable of sustaining the cool-headed, linear logic that longevity requires.

When people do change their behavior to improve their health, it is often an unexpected and epiphanous experience, seldom arising from a predictable, linear exposure to health messages. New Year’s resolutions and religious conversions are good examples of these random, stochastic properties of human change. Sudden and unexpected relapse also provides evidence of human failings in the realm of decisional balance and rational choice-making. Although people take action amid the heat and urgency of emotion and situational opportunism, this complexity is not reflected in the extant literature on the psychology of health behavior.

Evolved Motivations: Darwinian Keys to Understanding Behavior

It is argued in this paper that it is in fact Darwinian biology and humans’ evolved, largely unconscious intrapsychic structures that give our behavior quantum, nonlinear dynamics (i.e., small and unforeseen events creating major effects, and vice versa). Consider how intelligent, affluent, informed humans living under the most auspicious conditions readily undertake to be sedentary, to eat unhealthily, and to persist with dangerous habits such as smoking, unprotected sex, and drug/alcohol abuse. An adequate model of human motivation to explain this apparent contradiction is required. Such a model must (1) contextualize the continued disappointment with most health interventions and (2) explain humans’ behavioral atavism.

In making a case for a more effective paradigm, Barkow calls for progress beyond the “standard social science model” and instead proposes a revised, adaptationist perspective on human behavior. Barkow suggests a Darwinian, evolutionarily informed praxis—a way of thinking about health and social challenges in light of the human evolutionary journey. A promising development is that this process is taking root in medicine and is facilitating a somewhat antithetical view of symptoms, both physical and psychological, not as pathologies but as manifestations of adaptations acquired by our species in the service of survival and propagation. However, the overwhelming majority of health behavior research remains firmly rooted in the standard social science model and in the exploration of contemporary, culturally determined antecedents of change with little emphasis on humans’ evolved heritage.

Contextualizing health behavior within ancestral behavioral ecology could, however, enhance understanding of hu-
man’s apparently defiant response to well-intentioned health messages—something that extant models presently do not achieve. As a result, it may be possible to forge a health behavior model of greater historical integrity and one that has, at its core, an evolutionary heuristic rather than a modern cognitive/social-learning model. Such an algorithm might account for humans’ evolved nature and preferences as they arose not over each person’s own limited lifetime, through personal experience, but within the genotype over many millennia amid challenging, prehistoric, ancestral environments. It was in such a world that the human brain evolved functional, modular units, and motivation to act in certain ways was honed.

A priori adoption of a Darwinian blueprint might also highlight pre-emptively those problems Grinde has referred to as “discords”—aspects of the modern, developed world, including attempts to improve health—that are at odds with humans’ evolved nature and motivations. Although practitioners using the standard models consider only solutions involving human learning and features of the modern environment, a Darwinian health programmer might ask how congruent any modern cultural practice or proposed health intervention is with the behavior and psychology of our human/hominid ancestors. In other words, a reasonable question might be: “could a displaced, prehistoric hunter–gatherer living in modern western conditions be reasonably expected to act on and sustain this kind of health advice?” It is the task of health behavior theorists to imagine how evolved, mammalian traits may be co-opted productively by current interventions. The alternative, perhaps, is failure and an escalation of a tabula rasa fantasy in which people are viewed as de novo arrivals on the planet, who are passive, linear learning agents void of any predisposition and capable of learning and/or doing literally anything by responding in a simple dose-dependent manner.

An adaptationist, Darwinian model must use as its yardstick the observed universality of long-standing human behavioral patterns as evidenced by the repertoire of both prehistoric and modern humans. Enduring, ubiquitous traits will be related to the ultimate, distal goals of all human behavior (i.e., survival and successful reproduction via a range of complex, proximate, intermediate means). A number of theorists writing on the theme of human motivation have addressed these proximate behaviors, and Table 1 provides a brief, non-exhaustive, heuristic summary of what could be called “evolved motivations,” which are intrapsychic, possibly unconscious drives that appear markedly consistent across both time and culture.

Humans universally engage in seeking out partners, developing and cultivating friendships (or conflicts), caring for family, pursuing ownership of items and food, working on accrual of higher rank and status, experiencing pleasure and seizing hedonistic opportunity including rest and inactivity, adopting care and defensive caution, play, and safe exploration. At times these motivations exist in stark opposition to one another. For example, promiscuity and an underlying drive to seek opportunistic sex may enhance chances of successful mating and generation of new offspring. However, such drives may run counter to other instincts that engender familial fidelity, nurturance of existing offspring, and established monogamous bonds. Equally, an innate desire to procure food or access to land and resources may conflict sharply with a drive to achieve safety and minimize risk of injury, predation, or hostility from competitors.

Further, despite variation in the form and manner of expression, these archetypal behavioral patterns are demonstrably sustained throughout the human life span.

### Table 1. Heuristic taxonomy of competing, evolved motivations and associated behaviors

<table>
<thead>
<tr>
<th>Evolved motivation</th>
<th>Observable behaviors associated with motivation</th>
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<tbody>
<tr>
<td><strong>Sex</strong></td>
<td>Courtship; mating behaviors; sexual signaling and display; intercourse</td>
</tr>
<tr>
<td><strong>Rearing</strong></td>
<td>Caring for children and kin; investing time and resources in children and family; attachment behaviors</td>
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<tr>
<td><strong>Procurement</strong></td>
<td>Obtaining food, items, and belongings; hunting/gathering; spending time in acquiring things of value or utility; preparing items for use or consumption; invention and creation of helpful tools/technology</td>
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<tr>
<td><strong>Rank/status</strong></td>
<td>Patterns of dominance/submission that are visual, verbal, and physical; maintenance and improvement of rank and status; competitive display and signaling; physical conflict; complex social dynamics of approach vs avoid; stigma; gossip</td>
</tr>
<tr>
<td><strong>Security</strong></td>
<td>Attraction to feelings of safety, comfort, sleep, and rest; pursuit of feelings of security; avoidance of danger and risk; taking practical precautions; protective emotional states both positive (love, happiness) and negative (fear, anxiety, sadness)</td>
</tr>
<tr>
<td><strong>Pleasure</strong></td>
<td>Exploration of new places and opportunities; pursuit of novelty and discovery; play; sensation-seeking; eating; sex</td>
</tr>
<tr>
<td><strong>Social cohesion</strong></td>
<td>Corporate activity/ritual and ceremony/conversation/recreation and games/group play</td>
</tr>
<tr>
<td><strong>Meaning</strong></td>
<td>Religion; spirituality; legacy; arts, storytelling, music-making, culture, modes of entertainment, humor</td>
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across cultures. Their ubiquity and permanence likely arise from their functionality and utility as means to Darwinian ends. Sadly, much of the modern health agenda—aerobics, dietary restraint, nonsmoking, seat- belt use—requires promotion of a set of behaviors that often lack meaning and value in an ancestral sense. This mismatch underpins the disappointment that frequently characterizes health promotion efforts.

Explanatory and Predictive Power of an Adaptationist Model

According to the proposed model, the stochastic, chaotic nature of complex human behavior can be attributed to the sheer multitude of abrasive interactions occurring among competing evolved motivations as they collide in real time, each enjoying priority on a shifting basis. Depending on context and intrapsychic factors, the net behavioral outcome reflects the output of these competing drives and makes sense in evolutionary terms, but it may have little to do with health preservation. The complexity of such a process is captured in the lottery ping-pong ball analogy adopted by Resnicow and Vaughan as a means to depict a complex system: the ultimate outcome is profoundly difficult to predict given the immense quantity of unseen factors at play. Also, as with all complex systems, outcomes are highly sensitive to initial conditions, which in this case may include the full spectrum of human experience from birth onward.

Moreover, a heuristic taxonomy of motivations and behaviors not only helps reveal the roots of behavioral complexity but also provides a framework for making heuristic predictions about specific interventions (Table 1). It may offer a conceptual base to inform hypotheses about which behaviors are likely to persist, which to recede, and why. Unlike standard models, it could be used to scrutinize proposed interventions to apply against enduring human traits.

For example, through the socio-evolutionary lens, the “benefits” of an otherwise irrational, damaging behavior such as smoking are somewhat clearer. Smoking is an activity that evokes enjoyable sensations and emotional states (pleasure/security) and is often undertaken in social contexts, thereby contributing to the cohesion of small groups. In certain subgroups, the habit also may signal rank/status and increase desirability. Thus, from a Darwinian perspective, this apparently unhealthy behavior contributes to survival through social desirability and is therefore widespread.

The success of many smoking-cessation campaigns similarly can be understood from a Darwinian perspective. Governments have associated emotional discomfort with smoking via the creation of widespread smoking taboos/social stigmatization of smoking (affecting status, cohesion, meaning) and fear (affecting security). Legislation also has been introduced to render smoking prohibitively expensive (procurement). Most importantly, governments have undermined severely tobacco’s social-cohesion benefits by banning it in public places; thus, it is no longer the catalyst for kinship it once was.

Where such campaigns succeed, they do so because they grasp the problem at its functional roots, depriving smoking of its capacity to fulfill evolved motives to acquire safe, affordable pleasure that enhances social status. The changes cause smokers to feel financially stressed, increasingly afraid of illness and an unpleasant death, and dispossessed of social approval. Anti-smoking campaigns and concurrent legislative changes have been unknowingly Darwinian in nature, and therefore effective. Few, however, would construe the mechanics of their success in adaptationist terms. However, it is easy to imagine a tobacco-using coalition of paleolithic hunter–gatherers shifting their behavior away from smoking if acquisition of tobacco became excessively laborious and if new social rules/superstitions created marked fear, hostility, and stigma associated with its use, particularly those linked with grave misfortune, sickness, and death.

A second example is gym membership, which is often the goal of government-subsidized health programs. Taken at face value, gymnasiums seem to present major benefits in Darwinian terms (survival-related aspects are shown in parentheses): they are safe, supervised, comfortable places (security) where people can socialize (cohesion); enjoy sensations of movement (play/pleasure); challenge others through demonstrations of superior strength/skill or fitness (rank); and maybe find a partner (sex). An accomplished runner might find opportunity for playful dominance of peers and sexual signaling amid a busy array of cardio machines. Presumably, this would lead to the runner’s visiting the gym with regularity and fervor.

Outcome research paints a less-flattering picture of gyms. Users seldom sustain membership long enough to accrue substantial health benefit. More commonly, gyms are experienced as prohibitively expensive venues (procurement) and inaccessible to those who lack private transport (security). They widely evoke anxiety and discomfort among many who fear a humiliating loss of self-esteem in entering a milieu of more-able users (security and status). Moreover, many of the activities advocated in gyms are largely sterile in evolutionary terms (e.g., treadmill running or stationary cycling) and subsequently are felt to be intolerably aversive and monotonous rather than pleasurable. In Darwinian terms, it is likely that most people must invoke financial, physical, and social risk in order to attend gyms—something we are unlikely to do repeat-
edly over time. Despite the clear health rationale for gym use, the patterns of membership and the small percentage of those who persist in using them indicates a motivational discord of ancestral origin.

The proposed model predicts that other public health challenges might be targeted successfully in the same manner, such as fast-food/sweetened-beverage consumption. Affecting behavior in these hedonic, impulse-driven areas will require a combination of evolutionary strategies. The onus in application is on resolution of the past–present mismatch and aligning the contemporary socioenvironment with archetypal motivations. These changes may take the form of legislative restrictions on the number of fast-food outlets (procurement); heavy taxation on unhealthy foods (procurement); stigma- and loss-framed media campaigns (status and rank); and graphic exposure of undesirable food production methods (safety, via disgust) and/or obesity-related health complications (safety/security). Moreover, as Resnicow and Page point out, interventions need to be offered on a repeating basis, so that individuals have the opportunity to experience the “perfect storm” of a symbiosis of environment and intrapsychic factors.

Comparison to Other Theories of Health Behavior

Counterarguments to the outlined model might conclude that it is a cosmetically altered recapitulation of social-cognitive theory and other current health models. It is true that broad parallels can be found between compatible concepts such as perceptions of susceptibility (security); vicarious learning (meaning); and social norms. Possibly, an adaptationist position could be refined and expanded using adjuctive, existing concepts, especially because memetic, cultural evolution is intertwined with biological evolution.

Of all the extant models, self-determination theory (SDT) is a “needs”-based framework that dovetails most with Darwinian predictions. Its emphasis on competence, autonomy, and relatedness indicates a certain conceptual compatibility with evolutionary concerns such as rank, subordination, and social cohesion. Additionally, the model acknowledges that behavior is mediated by emotional experience and tone.

However, these models carry assumptions about limitless behavioral plasticity and flexible, conscious choice. Their predictions conflict with the adaptationist framework, which makes very conservative predictions about humans’ capacity for behavioral change in the absence of substantial external pressures. The standard social science model assumes no such limits and therefore sustains the problematic blank-slate view of human nature. Existing health models do not predict the kinds of behaviors that might be undertaken reasonably by humans for any purpose; an evolutionarily informed viewpoint does.

Additionally, the evolutionary model repeatedly draws attention to the role of human history, ancestral social structures, prehistoric ecology, and enduring strategies used to navigate therein. The model serves as a reminder that other mammalian species display similarly inflexible behavioral patterns, and these can inform studies and interventions. Crucially, and revealingly, humans do not routinely endeavor to radically alter the behavioral traits of other mammals or ascribe to them marked capabilities in the area of self-denial and behavioral control in the absence of a radical manipulation of their environment.

The evolutionary model also encourages constructive critique of many modern practices and technologic developments, including health behaviors themselves, particularly where they distance people from long-standing aspects of established human existence. Lastly, the evolutionary model accommodates human irrationality, emotionality, and behavioral inflexibility because these qualities are the product of evolution and the development of a species that has survived on the basis of quick, heuristic thinking and hot emotionality.

Conclusion

Until psychological models of human health behavior are infused with Darwinianism in greater measure, they may risk continued delivery of costly, unsustainable intervention programs offering only brief, suboptimal success with minimal explanation of its causes. The Darwinian perspective uniquely accounts for humans’ abundant fallibility in changing behavior in the health arena; it also identifies the various evolved origins of behavioral complexity generally. In light of evolution, failures to act in the interest of one’s health emerge not as character flaws, lack of education, inaccurate cognitions, or lack of opportunity but as products of intensely complex, evolved motivations about which individuals may consciously know little or nothing.

The implications of Darwinian praxis for social reorganization in the service of health are vast, and in the absence of miracle pharmacologic cures for chronic diseases, radical and politically progressive policies are necessary. In this regard, the efforts regarding smoking are encouraging. The epidemic of “diabesity” requires similar action on the food chain and its economics.

Darwin’s gift, the evolutionary paradigm, provides the science and art of health promotion with a tableau of human nature on which radical interventions can be tried and tested, honed and refined, without naiveté or unex-
pected disappointment. Additionally, if the applied science of the health psychology field is itself to evolve and to empower a transformative rethinking of health behavior, it must accept and adapt to the challenging environment in which it finds itself—a complex, stochastic system of competing, unlearned, evolved motivations.

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References