

Proximate and ultimate drivers of norms and norm change

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Abstract

We describe a formal model of norm psychology that can be applied to better understand norm change. The model integrates several proximate drivers of normative behavior: beliefs and preferences about a) material payoffs, b) personal norms, c) peer disapproval, d) conformity, and e) authority compliance. Additionally, we review interdisciplinary research on ultimate foundations of these proximate drivers of normative behavior. Finally, we discuss opportunities for integration between the proposed formal framework and several psychological sub-fields.

Keywords: social norms, preferences, beliefs, evolutionary foundations, ultimate drivers, proximate drivers, interdisciplinary research.

1 Introduction

To understand norm change, we must understand norm psychology [1]. We describe a formal model of proximate factors underpinning normative behavior. Additionally, we summarize theoretical research from evolutionary anthropology and biology, and economics, that offers insights into ultimate explanations for these proximate factors.

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Finally, we explore opportunities for psychologists to incorporate, and contribute to, the proposed interdisciplinary framework.

2 Conceptual framework

The framework posits – in line with economists’ view – that individuals choose behavior based on their preferences, given their beliefs about the situation they face. Many drivers of normative behavior and change have been identified [2, 3, 4, 5, 6, 7]. Accordingly, several alternative preferences are proposed in the literature, each focusing on a subset of factors [8]. A full understanding of norm psychology may, however, require gathering all the factors into one single framework. In the framework we adopt here, an individual’s action may be simultaneously influenced by material payoffs, a desire to act in accordance with one’s personal norm, a desire to avoid peer disapproval, a desire to conform with peers’ actions, and a desire to comply with actions prescribed by authorities (educational, cultural, religious, political, or administrative). This combination of motivations together define the individual’s preferences, which can be formalized by the following *utility function* [9]:

$$\begin{aligned}
 u = & \underbrace{\pi(x, \tilde{x})}_{\text{material payoff}} - \underbrace{A_1(x - y)^2}_{\text{cognitive dissonance}} - \underbrace{A_2(x - \tilde{y})^2}_{\text{disapproval by peers}} \\
 & - \underbrace{A_3(x - \tilde{x})^2}_{\text{conformity w/ peers}} - \underbrace{A_4(x - G)^2}_{\text{conformity w/ authority}}, \tag{1}
 \end{aligned}$$

where:

- x is the individual’s action and \tilde{x} his *empirical expectation* (the action he believes that peers will adopt): these actions determine his expected *material payoff*;
- y is the individual’s *personal norm* (the action he views as “the right thing to do” absent material well-being considerations and influence from peers or authorities): cognitive dissonance arises if the preference weight A_1 exceeds 0 and the action x differs from the personal norm y ;
- \tilde{y} is the *normative expectation* (the action that the individual believes that peers

think he should do): discomfort from *peer disapproval* arises if the preference weight A_2 exceeds 0 and x differs from \tilde{y} ;

- the individual suffers if the preference weight A_3 exceeds 0 and their action does not conform with that of their peers;
- the individual suffers if the preference weight A_4 exceeds 0 and their action differs from G , the action prescribed by an external authority.

This framework provides a formal description of associated psychological mechanisms at multiple levels of analysis [10, 11]. That is, each component of the preferences above demarcates a particular function: (i) maximizing material well-being, (ii) respecting one’s personal norm, (iii) avoiding peer disapproval, (iv) conforming with others’ behavior, and (v) obeying authorities. Gathering them into one mathematical function further shows how each purpose may be carried out algorithmically. Specifically, an individual decides on “the right thing to do” (y), and forms beliefs about others’ behaviors (\tilde{x}) and others’ expectations (\tilde{y}), using the available information. Among the feasible behaviors, they then select the behavior which best reconciles the multiple, possibly conflicting, purposes (i.e., the x that maximizes the value of the function).

The values of the preference weights A_1 , A_2 , A_3 , and A_4 define the extent to which each factor matters for the individual. The preference weights may differ across individuals, but they are taken to be constant over time for each individual. By contrast, the personal norm and the beliefs may change as new information appears. For example, the personal norm may change from “why should I bother washing my hands?” to “I should wash my hands” upon learning about the social benefits of hand hygiene. Empirical and normative expectations depend on observations of others’ behaviors and discourse. With the preferences described by the above utility function, norm change can thus result from new information becoming available: such new information can generate changes in an individual’s personal norm, triggering a behavioral change, which in turn affects others’ behaviors through the peer effects, and so on, until a new social norm (the common and commonly accepted behavior) emerges.

Evolutionary logic provides insights on the ultimate drivers of the personal norm (y), our susceptibility to social influence (\tilde{x} , \tilde{y} , and G), and their associated preference weights A_1 , A_2 , A_3 , and A_4 .

3 Evolutionary foundations

3.1 Personal norms

Theoretical research shows that evolutionary forces may shape a personal norm, and the weight attached to deviations from it (A_1). Humans should have developed a propensity to evaluate actions in the light of what their reproductive success would be if these actions were also adopted by others, and to care about deviations from this norm [12, 13]. This universalization process is reminiscent of Kantian ethics (“live your life as though every act were to become a universal law”), anchored in reproductive success. Personal norms such as “You shall not murder” or “You shall not steal” may thus have evolved a long time ago.

Evolutionary models show that the ultimate driver of such universalization ethics is the propensity for individuals with a recent common ancestor to interact [14, 15]. This propensity would have resulted from patterns of human group formation, and inter-group migration and interactions. It is viewed as forming part of the “environment of human evolutionary adaptation” [16].

Importantly, if fitness is correlated with material well-being, evolution should have led to such universalization ethics not only with reproductive success as criterion, but also with material well-being as criterion [14]. Moreover, these models encompass both biological and cultural transmission of traits.

These findings thus suggest that in the function above: (a) y would be the action that would maximize the material payoff, if that action was universalized; and (b) A_1 should be positive.

3.2 Susceptibility to social influence

The last three components in the function u specify distinct forms of social influence on decision-making. Substantial efforts have been dedicated to unraveling the evolutionary roots of susceptibility to such influences.

The current consensus is that our ancestors embarked on an evolutionary path marked by an increased reliance on cooperation [17]. In particular, the unstable environment of the Pleistocene should have played a crucial role in shaping the significance of culture and social learning as engines of cooperation in human evolution. Fluctuating conditions would have favored social learning over both genetic adaptation and individual learning, thanks to the induced flexibility in responding to environmental changes.

Early models showed the evolutionary viability of social learning by way of copying behaviors that are common (conformist bias), or exhibited by more successful (payoff bias) or prestigious (prestige bias) individuals [18, 19]. This suggests that when forming their normative expectations (\tilde{y}), and when comparing their behavior to that of peers, individuals should be expected to pay more attention to more successful or prestigious individuals. Recent work extends these findings while offering interesting nuances [20, 21, 22].

Self-domestication is also believed to have played a key role in human evolution [23]. This process, potentially driven by partner choice or the elimination of aggressive individuals, would have led to increased compliance with group norms [24, 25]. Moreover, humans have an extended childhood and significant involvement of non-parents in child-rearing. These factors likely fostered docility in children and, later, conformity in adults, i.e., positive preference weights A_3 and A_4 [26, 27].

Apart from social learning based on observation, humans have also developed intentional teaching, a form of learning that would have facilitated the rapid spread of innovations; those adopting the most beneficial innovations would have been more fit. In a model of the co-evolution of vertical social learning (i.e. from the previous generation) and horizontal social learning (i.e. from the current generation) based on prestige or conformity, the evolutionarily favored type of social learning was found to depend

on how environmental conditions change over the course of an individual’s lifetime [28].

Furthermore, self-inflicted punishment for deviating from normative expectations (\tilde{y}) can evolve [29]. Arguably, this can be interpreted as caring about peer disapproval, i.e., to imply a positive preference weight A_2 . Relatedly, norms and punishment of norm violators can co-evolve [30], and populations may include both over-socialized and under-socialized individuals, where the former are willing to make large material sacrifices, while the latter are unwilling, to adopt the desired behavior and to punish norm violators.

Overall, these studies explain how different forms of susceptibility to social influence could have become deeply ingrained in human nature. They suggest that when forming their beliefs, humans may be expected to pay attention to a variety of informational cues, including the behavior of peers and authorities, as postulated in the conceptual framework described above.

4 Opportunities for further integration into psychological research

The formalization of norm psychology described above can help psychologists move beyond verbal theories to develop precise predictions about normative behavior, identify potential intervention targets for behavioral change, and measure beliefs and preferences. For example, recent experimental designs detect the use of universalization ethics in social dilemmas and enable distinguishing between pro-social concerns and universalization ethics [31, 32, 33]. Further, experimental evidence shows that language as well as charisma of authorities matter for norm perception and norm compliance [34, 35]. Given their extensive training in experimental methods and measurement validation, psychologists are well-positioned to contribute to developing methods to test predictions of formal models and precisely measure theoretical parameters.

Different subfields of psychology may be differentially interested in specific parameters of the utility function u . For example, the beliefs (\tilde{x} and \tilde{y}) can be conceptualized as capturing an individual’s “construal” of the situation, which is a central focus of

social psychology [36]. Additionally, if between-person variation in preference weights (i.e., A_1 , A_2 , A_3 , and A_4) is stable across time, they may be especially relevant to personality psychologists because they dictate the extent to which different forms of normative influence drive an individual’s behavior, and thus can generate between-person differences in behavior even when beliefs are identical. A recent replication of the famous Asch conformity experiment offers indirect evidence that varying parameters of the utility function underpinning (non-)normative behavior (e.g., material payoffs) and personality traits such as openness, influence conformity rates [37]. Future research could measure individual differences in belief parameters and preference weights more directly to examine their stability across time and situations.

Psychological accounts of social emotions may also complement the above conceptual framework. Theoretical and empirical analyses suggest that social emotions, such as pride, shame, guilt, gratitude, and anger are strongly linked to social value [38, 39, 40]. To the extent that the costs of nonconformity and peer disapproval are realized as social value changes and associated problems (e.g., ostracism, reduced access to resources), the utility function components may describe parts of the computational architecture of social emotions. For example, the discrepancy between a behavior (x) and normative expectations (\tilde{y}) may be experienced as feelings of prospective shame or guilt by an individual when weighing the utility of an action; and peers may feel the discrepancy between an individual’s action and their own personal norms as anger. Other emotions, such as admiration, may function to identify and tag individuals whose actions or preferences become integrated within individual beliefs about actions prescribed by authority (G). These and other connections between computational approaches to emotions, psychological game theory [41, 42], and formal theories of norm psychology should be explored in future research.

The conceptual framework offered here can also guide research on cultural differences in norms and norm enforcement, which remains “mixed and fragmented” [43]. Recent findings indicate that changes in social distancing, handwashing, and other norms during the COVID pandemic varied significantly across countries [44, 45]; our framework suggests that this could be partially driven by differences in the preference weights A_1 , A_2 , A_3 , and A_4 , which in turn could be due to differences in environmental

conditions in the evolutionary past. Further, the psychological mechanisms underpinning punishment can be expected to respond to the material payoff of enacting punishment, normative expectations about punishment, empirical expectations, and authority proscriptions. Thus, future cross-cultural research can identify and systematically test socio-ecological factors that may contribute to differences in preferences and beliefs to better understand cultural differences in norms, enforcement, and rates of change. Relatedly, future research could examine whether and why different groups within populations differ in norm-driving preferences; for example, experimental evidence indicates that men are more sensitive to peer approval than women, which may suggest that evolution has shaped male and female preferences differently [46].

5 Concluding remarks

Evolutionary theory provides a foundation for the view that norms result from individual decisions based on preferences and beliefs, and suggests promising paths for collaborative research between scholars in economics, psychology, and evolutionary sciences [43, 47]. Indeed, social norms lend themselves naturally to interdisciplinary research [48, 49]. Such research can not only satisfy our wish to understand the world, but also inform the design of policies aimed at influencing social norms [50, 51, 52, 53].

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6 Further information on references of particular interest

- [8] ** This paper reviews theoretical approaches for modelling the origin, persistence and change of social norms developed over the last 40 years.
- [11] ** This review integrates Tinbergen’s Four Questions and Marr’s Three Levels of Explanation, emphasizing the development of formal models at the computational and algorithmic levels of analysis in order to strengthen our understanding of psychological phenomena, such as norm psychology.
- [33] ** This article proposes an experimental protocol and statistical methods to estimate preferences that combine material self-interest, Kantian ethics, and other-regard; it reports estimates of said preferences based on decisions in three economic games (sequential prisoner’s dilemma games, trust games, and ultimatum bargaining games).
- [37] * This replication of the famous Asch conformity experiment found that monetary incentives reduce but do not negate the effect of social influence, and that the personality trait openness is associated with lower susceptibility to social influence.

[45] * Based on data on empirical and normative expectations about social distancing and of sanctioning, this article provides evidence on how social distancing and sanctioning norms evolved as risk associated with COVID-19 changed.

[49] ** This article provides an interdisciplinary review of the emerging field of norm dynamics by integrating research across the social sciences through a cultural-evolutionary lens.

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