



Climate change mitigation within the Campbell paradigm: doing the right thing for a reason and against all odds

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The fact that a behavior can be instrumental for multiple goals does not logically entail that people are typically propelled into action for multiple reasons. On the contrary, goal-directed behavior in the real world is, in a given instance, aimed at one focal goal. In this article, I present the Campbell paradigm, in which a particular behavior is controlled by a single reason or goal. To identify the very reason (i.e. the focal goal behind a goal-directed behavior) and its motivating force, psychologists need to consider behavior-specific costs and whether other behaviors that are also instrumental for attaining the specific goal are realized as well. I situate my presentation in the context of climate change mitigation.

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Introduction

Climate change is among the prevailing themes of the 21st century in science and politics alike, and insights from the behavioral sciences seem critically important for effective mitigation [1]. Whereas some scholars advocate for laws, economic controls, so-called nudges, and other structural routes to mitigate climate change (see Refs. [2–4]), psychologists in the tradition of James [5] typically believe that climate change mitigation can effectively be promoted by altering people's reasons for engaging in behavior [6,7]. As personal reasons for action represent goals in this tradition, people are thought to be goal-directed and thus motivated to attain goals [8^{**},9,10].

In this article, I argue that for a comprehensive psychological understanding of behavior in real-life contexts, psychologists need to reconcile the fact that people are goal-directed (i.e. *final*) with the necessity that goals *causally* control behavior [8^{**},9,10]. This can be achieved with the Campbell paradigm [11,12^{**}]. The paradigm consists of a *measurement model* thought to identify (a) the focal goal behind a goal-directed behavior and (b) its motivating force (i.e. commitment to the goal). The paradigm also consists of a *behavior model* in which the personal commitment to a goal is expected to causally explain behavior along with behavioral costs. My argument in this article is situated in environmental protection research and therefore relevant for and applicable to climate change mitigation [13]. In the first section, I begin with the common understanding of people's behavior.

Multiple goals as boosters of behavior

A particular behavior can be instrumental for pursuing multiple goals [14,15]. For example, riding a bike can be instrumental for achieving cardiovascular fitness, saving money, and protecting the environment. Concomitantly, for a behavior to have a chance of being performed, especially when it is taxing, goals must be comparatively important, and thus, reasons for action must be comparatively forceful. Consequently, it is typically believed that in a venture to become sufficiently strong to eventually propel people into engaging in a behavior, *numerous* reasons in the form of *multiple* goals need to join forces [16,17]. That is, the expectation of a pleasurable, healthy, and thrifty bike ride along with the anticipation of others' approval can at times invigorate one's resolution to protect the environment and lead to the occasional bike commute.

The more instrumental a behavior appears to be for attaining various goals, the more favorable people's personal valuation of that behavior [16,17]. Unfortunately, professing support (e.g. for environmental protection) has in the past repeatedly failed to correspond with actual behavioral engagement [18,19]. The recurrent disappointment with the explanatory power of verbal expressions of valuation (the so-called attitude-behavior gap: e.g. Refs. [20–22]) has proliferated a multitude of rather complex behavior models in environmental protection research (see, e.g. Refs. [20,23–26]). For most of them, there is a lack of strong, experimental evidence for the causal effect of their motivating forces on actual behavior

(see, e.g. Refs. [27*,28*]). In the next section, I focus on how people can alternatively be thought to deal with the fact that they hold many, sometimes even incompatible goals.

Implementation of consecutive goals

Faced with many—even incompatible—goals, among which environmental protection could be but one, people are traditionally believed to favor behavior that simultaneously serves multiple goals [16,17]. However, as suggested by Huxley [29], people could as well follow another strategy and implement their goals in sequences of changing importance. Consequently, each specific behavior is thought to be controlled by one focal reason (i.e. one goal) at a time, whereas all other goals, whether competing or allied, are silenced.

In his renowned allegory, Huxley [29] portrayed the locomotor system, ‘the machinery of action’ (i.e. the human body), as a ship with captains, representing different personal goals, vying for command. In this allegory, the captains have to command the helm for the ship to move *effectively toward a goal*—toward a specific port. For the captains to head for and eventually reach their targeted ports (i.e. *attain goals*), they must not only fiercely *struggle for command* but also *exclusively remain in command* of the helm. In other words, actors have to be forcefully committed to goals, sometimes for a long time to be effective. Otherwise, when people strive to attain several goals simultaneously (as suggested in some of the contemporary behavior models in environmental protection research [23,24]), they might find themselves caught between goals: ‘balanced in irresolution’ (p. 18), as Huxley put it.

Only strong captains (i.e. *important goals*) have a chance to win the struggle for command. As goals shift in their relative importance, any of the captains can at times be strong enough to control the helm, even the wish for a recreational beer after a hard day’s work. This does not mean that people need to consciously reflect on their goals or reasons for them to be effective [30]. Moreover, this is not to deny that people also hold goals they never attain despite taking occasional steps in the right direction.

Although people hold many goals, they pursue them *consecutively* (not simultaneously). However, this does not mean that people cannot synergistically combine visits to other ports while on the way to a specific port when these other ports are along the way. But this is more an issue of planning the attainment of various goals than of striving for multiple goals simultaneously. Next, I present a model in which behavior is controlled by a single reason. It is called the Campbell paradigm in reference to Donald T. Campbell, who suggested in

1963 that people’s commitment to a goal should be benchmarked against behavioral costs [31].

Goal-directed environmental protection

Before I explain how actors’ commitment to their goals is identified within the Campbell paradigm, I move to a surprisingly often disregarded aspect of goal-directed behavior: its costs must be counterbalanced with commitment.

Offsetting costs with attitude

Behavior refers to any unequivocally observable corporal activity [19]. However, only a subclass of behavior is goal-directed and as such controlled by internally represented goals or reasons [8**,30]. Specific goal-directed behavior (e.g. voicing an opinion or riding a bike) involves using the ‘the machinery of action.’ Because of its corporal nature, any behavior’s performance involves costs. In a single sense, behavioral costs refer to obstacles and to required personal resources (e.g. time, money, exertion, diligence). The costs of different goal-directed behaviors can vary greatly. For example, they are typically small for the behavior of verbally stating that one is an environmentalist, and they are substantial for the behavior of commuting by bike in inclement weather over hilly terrain.

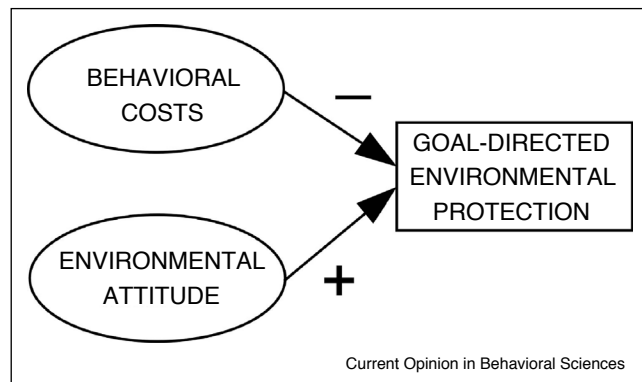
Behavioral costs derive from the sociocultural conditions in which people act, and they are behavior-specific [32]. As such, within the limits of a specific sociocultural context (e.g. Germany), behavioral costs constitute more or less universal ‘situational thresholds’ for engagement by those living in that context [31]. According to Campbell, costs must be counterbalanced by the actor’s commitment to a goal [33*]. Accordingly, various studies have revealed that people’s commitment to environmental protection and behavioral costs govern—as mutually compensatory factors (see Figure 1)—the performance of environmentally protective behavior: for example, the proportion of vegetarian lunches eaten [34*], the proportion of CO₂-optimal routes chosen [35], the proportion of green products placed in one’s shopping basket [36], and the seeking of climate-change-related information [37].

Over the years, and in line with Campbell [31], Kaiser and colleagues have come to interpret people’s commitment to a goal as *attitude* (see Figure 1; see also Refs. [11,38]). But as the proper label is less relevant than the empirical facts involved here [39], I will set this issue aside for now. I will return to it later.

In a nutshell

People’s commitment to environmental protection—their environmental attitude—generally controls their environmentally protective behavior, whether taxing or easy. Specifically, a person’s odds of engaging in a specific environmentally protective behavior (e.g. bike

Figure 1



A model of goal-directed environmental protection. The rectangle represents actual behavior. Ellipses stand for theoretically inferred causes.

commuting) versus not engaging in that behavior are, according to the Campbell paradigm, a function of their environmental attitude and the costs of the specific behavior (see Eq. (1)).

$$\ln\left(\frac{p_{ki}}{1-p_{ki}}\right) = \theta_k - \delta_i \quad (1)$$

In this equation (i.e. the Rasch model; for more details, see, e.g. Ref. [40]), the natural logarithm of the ratio of the probability (p_{ki}) of person k 's engagement relative to the probability of nonengagement ($1 - p_{ki}$) in a specific behavior i (i.e. its odds) is the result of the difference between k 's attitude (θ_k) and the costs of behavior i (δ_i). Thus, the strength of a person's attitude has to offset the specific costs of a particular behavior before the behavior has a reasonable chance ($p_{ki} \geq .50$) of being implemented by a person [11,12**]. Even a comparatively undemanding behavior (e.g. expressing the opinion that environmental protection is important) is unlikely to become implemented when an actor has no regard for environmental protection.

The larger the difference between attitude and costs, the more likely/unlikely it will be for a particular behavior to become implemented. For example, if the strength of a person's environmental attitude greatly exceeds the costs of the behavior—publicly stating that environmental protection is important—the person will be *likely* to express this opinion when asked about it. In return, if the costs of a behavior—commuting by bike—greatly exceed a person's environmental attitude, this person will be *unlikely* to commute by bike.

Because costs are either (a) not considered at all or (b) as person-dependent (rather than behavior-specific)

features of behavior in environmental protection research, the significance of environmental attitude for behavior is often underestimated [41], especially under extreme conditions (i.e. when so-called high-cost or low-cost behavior is investigated; see, e.g. Refs. [42–44]). To properly estimate the significance of environmental attitude for environmental protection, the strength of an attitude relative to behavioral costs needs to be considered [11,12**,33*]. In other words, costs—surmounted or dodged—are informative benchmarks for people's attitude.

Informative and uninformative behavior

Specifically, situations in which we learn about *engagement* in a *demanding* behavior or *nonengagement* in an *undemanding* behavior are both informative with respect to the strength of a person's attitude. If a person *engages* in a *demanding* behavior to protect the environment—commuting by bike—we know right away that engagement in a less demanding behavior—stating that environmental protection is important—is *likely* to occur too. This is because people who engage in comparatively demanding—high-cost—behaviors hold more pronounced environmental attitudes than people who do not engage in such behaviors [33*]. Conversely, if we learn that someone did not engage in an *undemanding* behavior—stating that environmental protection is important—we also know that demanding behaviors—commuting by bike—are *unlikely* to occur because this person lacks the necessary environmental attitude even for the undemanding behavior.

The opposite situations—*nonengagement* in a *demanding* behavior and *engagement* in an *undemanding* behavior—are, by contrast, uninformative. Even if we know that someone does not commute by bike, we cannot really conclude anything about his or her view on the importance of environmental protection. Likewise, if we know that someone has voiced the opinion that environmental protection is important, we cannot know whether he or she commutes by bike. Predictably, witnessing undemanding expressions of opinions cannot really help us anticipate more demanding behavior [45]. Therefore, psychologists should stop treating the voicing of undemanding opinions (e.g. 'environmental protection is important') as revealing expressions of attitudes; otherwise they will continue to find attitude-behavior gaps [20–22] when people seemingly say one thing and do another [18,19].

Identifying people's environmental attitudes

Before attitudes can become revealing and, thus, tested for whether they empirically account for a behavior, they must first be identified. However, this is problematic because attitudes—personal valuations of people and objects, such as environmental protection—are presumed to be representations hidden in people's minds (see Refs. [46,47]). These attitudes are further believed to eventually

become—via more or less intricate processes—evident in what people say and do [48,49]. Consequently, the reverse, identifying people's attitudes from their verbal and non-verbal acts, seems only reasonable [12**,48].

As one and the same (verbal or nonverbal) behavior can help attain different goals [30], behavior is thereby inconclusive with regard to the goal toward which it is directed [8**]. Bike riding, for example, can be instrumental for improving one's cardiovascular fitness, saving money, and protecting the environment. As a consequence, even if we see someone riding a bike or hear the person approving of environmental protection, we cannot know the person's reason for doing or saying so.

Fortunately, for a behavior to become effectively instrumental for goal attainment, it must be coordinated with other behaviors necessary for goal attainment. This is analogous to Huxley's [29] captains who, in order to effectively reach a targeted port, need more than control over the helm. The engine has to be maintained, the route determined, the crew provided, and the various activities coordinated. To identify the goal behind a specific goal-directed behavior, psychologists must consider how persistently a behavior is initiated [30] and whether other behaviors necessary to attain the same goal are initiated as well [11,31]. As derivatives of behavior, Campbellian attitude measures are akin to what economists call *revealed preference* measures [50]. Unlike revealed preferences in economics, people's attitudes are not revealed by a single behavior within the Campbell paradigm.

In summary, if people genuinely aim to protect the environment, they use a variety of available behavioral means to pursue that goal. Not only do they ride a bike, but they also recycle cardboard, avoid foods that are particularly environmentally harmful (e.g. meat), and refrain from owning a car [38]. Consequently, to find out about people's commitment to a goal, psychologists will do well to monitor arrays of behavior that are necessary for goal attainment. When measured accordingly, people's environmental attitudes demonstrate their durability against the test of time [51] and can be witnessed in the persistence with which committed people make use of energy-saving opportunities [52]. Consequently, people's environmental attitudes have been found to be relevant for people's more or less resource-protective lifestyles, visible in their electricity consumption [53].

Because people seem to accept costs to an extent that is consistent with the strength of their attitudes, environmental attitudes can be equated with the probabilities of the occurrence of the behaviors with which people typically aim to protect the environment [11,54]. Inevitably, an increase in people's environmental attitudes is accompanied by behavioral spillover: namely, an increase in the

probabilities of *all* behaviors with which people can technically express their commitment to environmental protection [55].

In conclusion, identifying personal commitment to a goal (e.g. environmental protection) for which a behavior (e.g. bike riding) is instrumental requires psychologists to consider the persistence and the convergence of goal striving. To do so, they must take stock of the extent to which people engage in various behaviors that involve increasing costs to attain a respective goal. This is why measures of the environmental attitude of people within the Campbell paradigm typically (but not exclusively, see Refs. [12**,39]) consist of self-reports of past more or less taxing environmentally protective behaviors (i.e. the General Ecological Behavior scale; e.g. Refs. [56–58]).

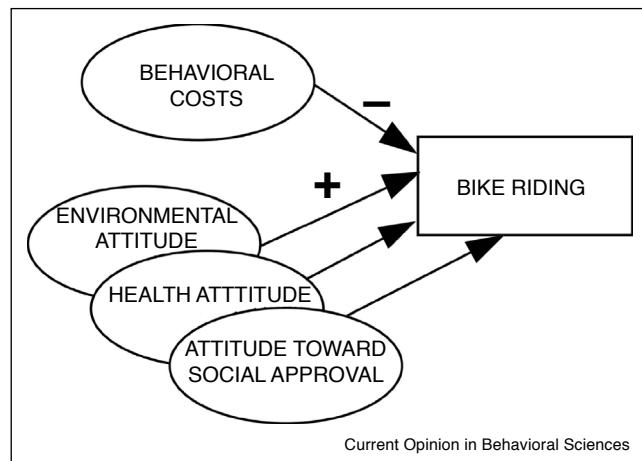
Many goal-directed behaviors

The model in Figure 1 does not imply that a specific goal-directed behavior (e.g. riding a bike) is exclusively aimed at environmental protection. Riding a bike can just as well be aimed at maintaining one's health or at gaining social approval to name but two more goals. For a specific actor, when bike riding is aimed at environmental protection, and thus reflects the actor's environment attitude, we call it an environmentally protective behavior (Stern [26] called this the intent definition of behavior). For a different actor, bike riding is called health behavior if maintaining one's health is the goal. Or, if gaining social approval is the actor's goal, bike riding can be described as pleasing others.

The fact that a behavior can be instrumental for multiple goals does not logically entail that a behavior is aimed at multiple goals *simultaneously*. Rather, different people have different reasons, and different reasons control people at different times. If we, in psychology, wish to more completely understand the occurrence of actual behavior (e.g. bike riding) in real-life contexts, we need to consider *all* the reasons that could control a specific corporal activity held by various people. For this, we must employ as many behavioral models as there are personal goals for which a specific behavior is instrumental (see Figure 2).

Consequently, what might sometimes appear to be an extremely small proportion of explained variance in behavior [18,19] might actually be an overly narrow focus on one exclusive reason for a behavior that is potentially instrumental for a multitude of goals. Thus, instead of more complex behavior models in which multiple reasons propel an individual to act (see, e.g. Refs. [23,24]), a more complete coverage of people with different reasons for seemingly identical corporal activities is essential. In a world of virtually infinite personal reasons for a behavior, each *strong enough* reason might only account for a tiny fraction of the manifestations of a specific behavior. Thus,

Figure 2



A model of goal-directed bike riding applied to various actors aiming to achieve different goals. The rectangle represents an actual behavior. Ellipses stand for theoretically inferred causes.

psychologists need to stop confusing small proportions of explained variance with the behavioral irrelevance of reasons and, thus, of attitudes.

Conflict of interest statement

Nothing declared.

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