

# Going beyond the individual level in self-control research

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## **Abstract**

Self-control research has primarily focused on self-control as an individual struggle, viewing it as either an intrapersonal mechanism, personality trait, temperament, or cognitive ability. However, this individual focus is challenged by the growing recognition that individuals engage in the selection and shaping of stimulus and social environments, and stimulus and social environments shape individual self-control success (person-environment transactions). In this Perspective, I argue that self-control's intricate connection to environmental factors calls for a more holistic multilevel approach. This approach considers not only how individuals actively shape their microenvironments, but also how their microenvironments are themselves shaped by other agents at the micro, meso, and macro (system) level of analysis, influencing the availability, salience, proximity, affordability, and normativeness of choice options. Using obesity and unsustainable consumption as primary examples, I show how a multilevel approach to self-control can help identify structural barriers to behaviour change and corresponding levers for public policymaking. Furthermore, a multilevel approach raises unexplored issues of agency, power, and awareness of being shaped, and elucidates the potentially important role of public policy support and collective action on changing systems that capitalize on self-control 'failures'.

## Introduction

People often encounter motivational conflicts in which they must somehow choose between a highly enjoyable, tempting option and an option that is more long-term oriented or prosocial. This phenomenon is the focus of self-control research, where self-control is typically defined as the process of advancing a self-control goal over a conflicting motivation<sup>1-4</sup>. This definition reflects the consensus that self-control implies a motivational conflict, which distinguishes self-control from self-regulation (the broader set of processes involved in selecting, advancing, and sometimes abandoning a given goal<sup>1,3,5</sup>). For example, desiring to choose a lunch option containing meat while harbouring a personal goal to reduce meat consumption in light of environmental, ethical or health-related concerns constitutes a self-control conflict. By contrast, trying to locate and navigate to the closest restaurant offering high-quality lunch constitutes an instance of self-regulation.

The repeated enactment of tempting choice options can have substantial long-term costs such as health issues or financial problems<sup>6</sup>. Good self-control has also been identified as a long-term predictor of academic and professional achievements, good health, and satisfying relationships<sup>6-8</sup>. Public health data suggest that behavioural choices that presumably reflect self-control struggles, such as the over-consumption of unhealthy foods, tobacco, alcohol, and illicit drugs, might result in a considerable number of avoidable deaths each year<sup>9</sup>. In light of these practical implications, a deeper psychological understanding of self-control has enormous implications for public policymaking that seeks to address self-control problems.

Traditionally, self-control research has focused on self-control as an individual-level struggle, viewing it as either an intrapersonal mechanism, personality trait, temperament, or cognitive ability<sup>6,10-13</sup>. The individual-struggle approach reflects a prevailing narrative according to which self-control success or failure is largely determined by an individual's free choice and a matter of personal responsibility. Indeed, recommendations for improving self-control in best-selling

popular science books centre on individual-level motivational strategies, such as strengthening willpower, curating self-discipline, or building better habits<sup>14-16</sup>.

The methods used to study self-control also reflect this individual focus. To study self-control, researchers often rely on laboratory tasks that assess an individual's ability to resist immediate temptations in order to reach long-term goals (such as the delay of gratification paradigm<sup>17</sup>), executive functioning tasks, choice scenarios, or subjective self-reports<sup>18</sup>. Typically, these methods are administered in a de-contextualized way, that is, with little reference to the kind of environments people are part of and navigate in their everyday lives. Similarly, the bulk of behaviour change research focuses on ways to improve individual struggles. For instance, research on self-control training has investigated whether and to what extent self-control can be improved via practicing control over dominant responses<sup>19</sup> or optimal goal setting<sup>20</sup>, training executive functions such as inhibitory control<sup>21,22</sup>, and cultivating good habits and routines<sup>23</sup>.

The individual focus has resulted in numerous important insights into the determinants of and processes underlying self-control in various subdisciplines. For example, personality research has uncovered important trait dimensions of self-control such as impulsivity, conscientiousness, or trait self-control<sup>24</sup>. Motivation science has yielded numerous insights into the components, processes and strategies that facilitate or hinder the resolution of self-control dilemmas<sup>2,25</sup>. Cognitive psychology and social-cognitive neuroscience have scrutinized relevant aspects of valuation<sup>26</sup>, cognitive conflict resolution and control<sup>27</sup>, and effort allocation<sup>28</sup>. Development research has studied when, how, and with what effect children and adolescents acquire self-control capacities<sup>29-31</sup>.

However, theoretical approaches to self-control that focus on the individual fall short of capturing the dynamic relationship between individuals and the immediate and larger social and stimulus environments in which people are embedded. Given the practical societal implications of self-control problems, this issue also resonates with criticisms of an individual-centred focus in

behavioural public policy<sup>32,33</sup>. This criticism was reignited in 2022 by an influential article<sup>32</sup> by Chater and Loewenstein who argue that focusing on solutions to public-policy problems that target individual behaviour (i-frame solutions) might deflect attention and support away from more impactful systemic (s-frame) public policy solutions.

In this Perspective, I advance a multilevel approach that addresses the shortcomings of the individual focus in self-control research (**Table 1**). First, I review research which shows that self-control is influenced by environmental factors. Next, I describe a multilevel approach that seeks to understand how individual and structural factors operating at different levels of analysis intersect to jointly shape self-control outcomes. This approach assigns an important role to the proximal physical and social microenvironments people navigate in their everyday lives. Crucially, a multilevel approach goes beyond merely noting the relevance of such microenvironments by asking both how individuals actively shape microenvironments and how microenvironments are themselves shaped and structured by meso-level and macro-level factors beyond individual agency, such as cultural, economic, and policy-related aspects. Finally, I describe the many new transdisciplinary opportunities (and challenges) for self-control research stimulated by this broader view on self-control.

### **Self-control and environmental factors**

The traditional focus on self-control (as an individual struggle of willpower when faced with a given temptation) tends to neglect possible bi-directional relationships between individuals and the environments in which these temptations might (or might not) occur. These relationships include not only the extent to which individuals might actively shape the kind of environments they navigate but also the extent to which people's self-control choices might be shaped by the environments they often find themselves in. I henceforth refer to these aspects as active shaping and being shaped, respectively. For example, some people might be better than others at avoiding tempting stimuli altogether or removing them from their environments (active shaping). However,

not all environments are under people's personal control. Rather, people's options might often be shaped by other people's intentions, group-level or cultural factors, or by companies, industries, or political institutions (being shaped).

In this section, I review self-control work from the past decade that has begun to identify and acknowledge such person-environment transactions. This research has in large part involved ecologically valid field studies observing how self-control unfolds in people's everyday environments and investigating how variations in environmental features and design factors outside the relatively narrow confines of the laboratory influence people's self-control choices.

### ***Active shaping of environments***

The field of self-control was transformed by the discovery that everyday self-control success and failure can be strongly determined by whether people engage in proactive (or preventive) forms of self-control, specifically situation selection (selecting into environments that align with long-term goals, thereby reducing the need for self-control, and avoiding problematic, tempting environments) and situation modification (making changes to one's immediate environment, such as removing tempting stimuli, to facilitate self-control)<sup>1,5,25</sup>. Proactive self-control subsumes all strategic forms of self-control harnessed at an earlier point in time that influence the extent to which temptation might emerge at a later point in time, what behavioural choice options might be available in response to it, and how motivated and capable a person will be to act in its presence. Proactive self-control can be contrasted with reactive (or interventive) self-control—the way people react to temptation in the present once a problematic desire has become a dominant motivation<sup>5</sup>.

For instance, research on everyday self-control using ecological momentary assessment showed that people high in trait self-control reported lower average desire strength and experienced fewer problematic desires (temptations) in their everyday lives<sup>34</sup>. Paradoxically, participants who described themselves as good at self-control seemed to use self-control as traditionally understood

(effortful inhibition or ‘willpower’) less often than those who described themselves as bad at self-control. Rather, everyday-life signatures suggested that those who described themselves as good at self-control circumvented—rather than confronted—motivational conflict better than their counterparts by avoiding exposure to tempting stimuli. To further test this idea, participants’ reported desires were rated by independent judges. The analysis of those external ratings supported the conclusion that participants who described themselves as good at self-control navigated a less tempting landscape of desires than those who described themselves as bad at self-control<sup>34</sup>. This finding is consistent with the notion people good at self-control engage in more active shaping of their stimulus environments than people bad at self-control. Additional work using more controlled paradigms confirmed that people high (as compared to low) in trait self-control are better at avoiding tempting situations and distractions (situation selection)<sup>35</sup>, and at setting up their environments to reduce the experience of obstacles to self-control goal pursuit (situation modification)<sup>36</sup>.

Social environments can also be actively shaped. Specifically, people might actively shape goal-supportive social environments by actively approaching others who are instrumental for advancing self-control goals<sup>37,38</sup>. In fact, social support seeking has been identified as an important part of people’s repertoire of self-control strategies<sup>39</sup>. Again, those good at self-control are better at harnessing such a strategy than those who are bad at self-control<sup>38</sup>. For instance, high trait self-control individuals show a stronger preference for strategically selecting themselves into goal-supportive social environments than those low in trait self-control<sup>38</sup>. This finding resonates with the above finding that people high (as compared to low) in trait self-control are better at situation selection<sup>34,35</sup> and has been replicated in real-life contexts<sup>40</sup>.

Individuals with better self-control also have an easier time engaging in beneficial behaviors<sup>41</sup>. Specifically, good self-control has been linked to the cultivation of beneficial habits that reduce the need for effortful inhibition<sup>42,43</sup>. Setting up good routines and habits typically requires people to both create stable performance contexts (for example, a distraction-free

environment for studying) and to seek out these contexts regularly<sup>44</sup>. Thus, the literature connecting trait self-control to good habit formation is consistent with the key role of active shaping of the environment in successful self-control.

Taken together, these findings regarding trait self-control clearly demarcate the limits of traditional notions of self-control based on behavioural inhibition to account for the full spectrum of observed self-control phenomena<sup>1,5,25</sup>. Collectively, they suggest that people good at self-control actively shape their environments via a repertoire of smart strategies (that does not include effortful inhibition). The proactive strategies discussed might help people to avoid internal conflicts by circumventing problematic contexts, by removing tempting stimuli from their microenvironments, and by cultivating beneficial enactment opportunities and social environments.

The idea that proactive strategies are used by those good at self-control is also reflected in new theoretical models of self-control<sup>2,25</sup>. For instance, the process model of self-control incorporates situation selection and situation modification as early strategies of self-control, alongside three intrapersonal strategies (attentional deployment, cognitive change, and response modulation) that come later in the process<sup>25</sup>. One of the key predictions of this model is that early-stage proactive strategies are more effective than late-stage reactive strategies<sup>45</sup>. However, this prediction has received mixed support to date (for a review, see <sup>4,46</sup>).

### ***Being shaped by environments***

The active shaping of environments by individuals engaging in self-control is only one side of the coin: Stimulus and social environments are often shaped by others—and sometimes even intentionally pre-designed by others<sup>47–50</sup>—which channels behaviour in certain directions and biases the availability, salience, proximity, affordability, and normativeness of choice options. In such cases, rather than shaping the environment, individuals are being shaped. For instance, epidemiological research on obesity has identified the role of the so-called obesogenic environment in contributing to the obesity epidemic<sup>51,52</sup>. In the case of obesity, these ‘built environments’ are

characterized by a high density of fast-food restaurants in one's neighbourhood, a low density of grocery stores, food pricing affecting food choices, low neighbourhood walkability, low availability of recreational facilities, and low street connectivity (which limits physical activity)<sup>53</sup>. As a second example, trying to live a sustainable, low-carbon life is extremely challenging in a world that is built around carbon-intensive production and consumption (see Box 1).

Self-control research attests to the constraining vs. facilitating role of environments in shaping food consumption. For instance, laboratory experiments<sup>54–56</sup>, field observations<sup>57,58</sup> and field experiments<sup>59,60</sup> show how variations in stimulus microenvironments impact the desire for and the choice and consumption of products. This body of research suggests that physical properties such as the availability and proximity of products, their placement, their presentation to the senses (for example, visual aesthetics and olfactory cues), and product size impact people's choice of options<sup>61, for a review, see 62</sup>.

This growing focus on the effect of microenvironments on behaviour is an important first step towards a more holistic understanding of self-control, and begs the question of how these microenvironments come to take on their everyday form in terms of the salience, availability, proximity, affordability, and normativeness of various choice options. Importantly, in everyday life, individuals are often being shaped by the decisions made by those who have agency and/or control over the design of these stimulus environments at the micro, meso, and macro level. Thus, people's microenvironments can be regarded as a central 'battleground'— a crossroad of overlapping spheres of influence outside people's heads in which self-control conflicts materialize.

At the micro level of analysis, microenvironments might not only be shaped through individual agency (as described above), but also by people in roles such as head of household, landlord, shop-owner, manager, or other choice architects<sup>49</sup>. At the meso level, microenvironments can be mediated and facilitated by administrators overseeing board provisioning in a school district, urban planners, management in larger corporations, or politicians in city or regional governments.

At the macro (or system) level, microenvironments might be pre-structured by political decision-makers via the type of policy instruments implemented (or not implemented) at a national or international level (for example, taxes on alcohol and sugary beverages<sup>63,64</sup>; an EU-wide carbon tax; a national ban on public smoking and tobacco advertising; or age-restrictions on gambling) as well as by corporate stakeholders (for example, through the way individual companies or industry associations market certain products and design consumer environments within a given legal framework).

Obesity, environmental behaviours, and addictive behaviours are just three examples of problem areas of self-control in which individual-level choice options and behaviours are influenced by (more or less regulatory) policy-making; other example areas (and regulatory policy examples in parentheses) include problematic media use (for example, school regulations on cellphone use<sup>65</sup>), aggression and violence (for example, firearm legislation and gun control<sup>66,67</sup>), sexual misconduct and assault (for example, laws addressing workplace sexual harassment<sup>68</sup>), or risk-taking (for example, implementing and monitoring speed limits<sup>69</sup> and laws that mandate motorcycle helmets<sup>70</sup>).

In sum, the prevalent focus of proactive self-control has been on the individual as the primary agent responsible for selecting or avoiding certain situations. However, there is growing recognition and empirical evidence that decisions outside of individual agency—that is, decisions by other agents located at the micro, meso, or macro level—play a major role in shaping opportunities and barriers for individual choice, ultimately influencing behaviour. These emerging insights challenge a deep-rooted cultural reflex to view behavioural outcomes as a mirror of individual willpower, and to stereotype these outcomes into self-control ‘successes’ and ‘failures.’

### **A multilevel approach to self-control**

There is no question that an individual approach to self-control is indispensable for a grounded understanding of self-control processes. A multilevel approach to self-control builds on

this foundation. It considers not only individual predispositions but also the larger social and structural context in which an individual's behaviour is embedded. A multilevel approach to self-control might build on well-established traditions of thinking and areas of application from other domains of psychology, notably ecological systems theory<sup>71,72</sup> in developmental psychology. Beyond psychology, such an approach resonates broadly with schools of thought in sociology, anthropology, and other social sciences that seek to overcome or reconcile the long-standing issue of whether structure vs. individual agency shape human behaviours<sup>73,74</sup>, and methodological (multilevel) approaches that seek to integrate levels of analysis<sup>75</sup>.

The multilevel approach to self-control proposed here integrates individual agency and structural forces through the concepts of active shaping of microenvironments and the passive being shaped by environments, identifying the microenvironment as the crucial point of overlap. It uses the interdisciplinary, broadly accepted macro, meso, and micro frame of reference as an analytical tool for illustrating its key logic, but more refined frameworks with additional layers of analysis (for example, the exosystem in ecological systems theory) also exist.

That people's microenvironments can be shaped proactively and/or can be shaped by agents, institutions, or cultural practices outside an individual's control raises new issues for understanding self-control processes. Specifically, a clearer understanding of the interface between the individual level of analysis and the microenvironment is needed, such as how desire for a certain consumption object emerges from the interplay of an individual's learning history (memory), need states (motivation) and the physical availability of the object in the microenvironment<sup>54</sup>, and how the experience of self-control conflict or the motivation to control behaviour is influenced by the physical and social environment. For instance, the presence of enactment models (people who already engage in problematic behaviour) in people's microenvironment has been found to decrease control motivation<sup>34</sup>. Similarly, social network analyses suggest that obesity might spread in social networks: if one's spouse or best friend becomes obese, the likelihood of becoming obese increases<sup>76</sup>. Other aspects of processes that require more research include understanding what

aspects propel individuals to engage in proactive strategies to shape their stimulus environments or not, under what conditions such shaping attempts are successful, when and why people become aware of structural factors that shape their own options and how people attribute responsibility in response, and how people cope with biased stimulus environments.

Ultimately, answering these questions should result in a more comprehensive theoretical understanding of self-control that can be leveraged to support better solutions for changing problems of self-control in practice. Specifically, interventions aimed at reducing self-control failures can be sorted along a dimension from self-deployed to other-deployed<sup>77</sup> which corresponds to the notion of active shaping vs. being shaped. Self-deployed interventions entail active shaping strategies such as situation selection and modification. The strong vs. weak use of active shaping by those high versus low on trait self-control<sup>34–36</sup> might result in different microenvironments (in a context that allows for a sizeable impact of individual autonomy owing to limited influence from meso and macro levels; **Figure 1**). Thus, interventions could essentially empower individuals to take on more control over their stimulus environments (where possible), raising questions of how such interventions could be effectively taught and what the fertile conditions for their deployment are. For example, initial work suggests that interventions that elicit use of situation modification might be effective for advancing academic success among students<sup>45</sup>. These promising results suggest that people might under-utilize strategies aimed at shaping their microenvironments and that, in many contexts, there might be more potential for proactive control than people typically imagine.

Other-deployed interventions rely on policymakers to create beneficial stimulus environments via pull-policies (for example, incentives) or push-policies (for example, financial penalties or legal punishment) that range from no or only weak regulation (such as via information provision or default nudges<sup>78</sup>) to strong regulation (such as product bans, incentives, taxes, and prohibitive laws). Strong government regulation typically reigns in or controls the impact of actors from the private sector on shaping the environment, whereas weak government regulation enables

more shaping by private sector actors. Thus, consumer's microenvironments might differ as a function of strong vs. weak government regulation at the macro level (**Figure 2**).

For instance, the availability of unhealthy, high-caloric processed junk food and drinks creates an obesogenic environment that makes it more difficult for people to maintain a healthy weight<sup>51,52</sup>. The traditional individual approach to self-control might hold consumers responsible for the rise in obesity rather than the food industry which produces and markets products designed to exploit humans' evolved preference for sugars and fats. By contrast, a multilevel approach seeks to understand individual choices as being co-shaped by the larger food system including food retail (affecting the availability and nutritional quality of products within stores), food provision (foods and beverages provided or sold in publicly funded institutions), food labelling (written or graphic matter accompanying the food), food marketing (commercial activities designed to increase recognition, appeal, and purchase), food composition (nutrient composition and portion sizes), and food prices (relative price difference between healthier and unhealthy foods)<sup>79</sup>.

Without considering this larger context and the full portfolio of public policy measures, self-control research might tap into the i-frame trap: the tendency to over-emphasize the individual's role and responsibility for solving self-control issues that might be influenced by structural factors that are biased towards failure<sup>32</sup>. Focusing predominantly on such individual-level solutions might even undermine efforts and shift support away from large-scale policy solutions<sup>32,see also 33,80,81</sup>. Multilevel thinking might therefore help inform and guide public policy in self-control domains to address underlying systemic issues rather than individual weaknesses<sup>32</sup>. From this perspective, scholars of self-control research might benefit from increasingly close interdisciplinary contact with disciplines that explore sociostructural issues (such as income inequality, neighbourhood characteristics, and effects of public policymaking) at higher levels of analysis.

### **A multilevel research agenda**

A broadened perspective of self-control that considers structural and systemic issues raises many new questions that might not be self-evident (or might even be counter-intuitive) from an individual perspective. In this section, I highlight four research opportunities afforded by a multilevel approach.

### ***Prediction and understanding***

One core opportunity as well as challenge for a multilevel research agenda is to hypothesize and identify the key features that are relevant for self-control outcomes at each level and to refine the theoretical assumptions regarding how they might causally impact individual level cognition, motivation, and behaviour. For example, to what extent do key determinants (such as socioeconomic status, class, household income, neighbourhood and workplace characteristics, group memberships and social networks) structure people's microenvironments, thereby providing them with varying levels of access to options (and sometimes locking them into problematic choice environments)? What are the essential characteristics of group memberships, societies, cultures, and political systems relevant for self-control, and how do they shape people's actual opportunities for self-control? For instance, some groups or cultures might place a higher value on hedonism whereas others prioritize self-restraint<sup>82</sup>. In addition, macro-level cultural factors might shape the degree of situational constraint<sup>83</sup> which might have implications for the degree to which environments afford active shaping vs. being shaped.

The list of potential variables to investigate is long and selecting the relevant groups or levels of analysis is a key challenge to the required theory development. A number of integrative models of self-control have been introduced over the past decade<sup>2,25,84</sup>, but none feature a truly multilevel perspective. However, once the evidence-base has accumulated, emerging integrative models might propose broad pathways and principles through which individual self-control is shaped by micro-, meso-, and macro-level factors (and vice versa).

### ***Methodological approach***

A multilevel approach to self-control might stimulate new designs and techniques for collecting and analysing multilevel data. At a general methodological level, a multilevel approach requires researchers to observe (or manipulate) variability in microenvironmental factors, and ideally also at the meso and macro levels, and relate it to individual-level components of self-control (cognition, motivation, and behaviour). One general research question in this regard is how individual self-control outcomes change when structural context changes. Manipulating microenvironmental factors in isolation in a laboratory setting is feasible but runs the risk of artificiality and typically lacks ecological validity. By contrast, manipulating variables at higher (meso or macro) levels of analysis is generally impossible to accomplish in the confines of the laboratory (but virtual reality experiments might open new avenues here). The field of self-control would therefore benefit from alternative methods and solutions better suited to connecting levels of analyses, particularly large-scale multilevel databases in which individuals are nested within higher levels of analysis, such as groups or social networks, neighbourhoods or communities, regions, nations, and cultures.

Moreover, thinking carefully about the temporal dimension of the effects of interest might prove to be an important aspect of this new generation of research. At short timescales, multiple measures of situations can be collected via ecological momentary assessment, resulting in intensive longitudinal data which might shed light on how levels of analysis interact with and influence each other over time. At mid-term or long-term timescales, the effects of historical changes or natural experiments at the macro, meso, or micro level, such as changes at the level of policymaking (for example, introduction of a ban or levy) or economic crises resulting in an increased scarcity of choice options, could be tracked longitudinally. Such approaches could provide a justifiable basis for inferring causality if they include a transparent causal model, an identification strategy for how causal effects are estimated and potential confounders controlled for, and careful testing against violations of assumptions<sup>85</sup>.

Sampling or observing everyday variation in key features of microenvironments as they naturally occur is a promising avenue for addressing the above general research question because there are already several taxonomies that systemize key properties of proximal physical microenvironments (such as the TIPPMME-framework<sup>61</sup>) or that extend into macro-environments (such as the ANGELO framework<sup>52</sup>). These and related frameworks could be fruitfully combined with situation sampling paradigms<sup>50</sup>. Furthermore, technological advances such as mobile (geospatial) sensing<sup>86</sup> could be used to extract information about physical proximity to problematic vs. beneficial choice environments (for example, the density of fast food restaurants in participants' neighbourhoods)<sup>87</sup>.

At the macro level, cross-cultural or cross-national databases could be used to capture and study variation at the level of cultural norms such as possible cultural differences in the valuation of hedonism and self-discipline<sup>88,89</sup> or variation in consumer-protective public policy making between countries<sup>90,91</sup>. These suggestions are not exhaustive. For instance, the fields of environmental epidemiology and environmental health offer a long tradition and debate on designs and analytical approaches for studying macro-level factors<sup>92,93</sup> and additional methodological approaches (such as multilevel agent-based modelling<sup>94,95</sup>) could be harnessed to study the interplay between levels of analysis.

### ***Individual awareness, autonomy, and empowerment***

New research and theory building might also arise from questions at the individual level of analysis that would not be self-evident without a broader perspective on structural constraints on self-control. For example, how aware are people of the external restrictions on their choice options? Some research suggests that identifying obstacles to self-control goal pursuit might be difficult, especially under conditions of low self-awareness<sup>96</sup>. Furthermore, consistent with the correspondence bias (people's tendency to overestimate the impact of individual determinants of behaviour relative to environmental determinants)<sup>97</sup> and the literature on illusions of control<sup>98</sup>,

many people might harbour inflated impulse-control beliefs. This overconfidence in one's self-control ability to resist temptation has been linked with overexposure to tempting situations<sup>99</sup>. This finding suggests that people might generally underestimate the ways through which temptation-rich environments might undermine their individual potential for self-control. Lacking such awareness, they might overlook opportunities for avoiding or effectively altering their micro-environments (such as, for instance, via strategies of situation selection and modification, respectively). Future self-control research might benefit from research in areas of psychology where structural issues are gaining attention<sup>100</sup> (including prejudice<sup>101,102</sup>, inequality<sup>103</sup>, or climate change<sup>104</sup>) to better understand how awareness of environmental constraints (a presumed prerequisite for the active shaping of environments) could be increased.

However, awareness does not guarantee that people will attempt to gain more control over and change maladaptive stimulus environments. Even if people are aware of how a given situation or stimulus environment (such as problematic food environments) restricts their options, they might nonetheless lack a clear vision of how it could be changed or lack the self-efficacy beliefs required to do so. This raises the question of whether self-efficacy beliefs and related notions of control (autonomy) for changing the environment are well-calibrated (that is, grounded in a realistic assessment of the potential for structural change).

Regarding notions of self-efficacy and autonomy, there is an important, unresolved tension between the traditional, individual approach to self-control and the current multilevel perspective: The traditional approach can be characterized as striving to maximize or prioritize individual autonomy. This focus resonates with Western ideals of autonomy, as championed in influential theories of human motivation such as self-determination theory<sup>105</sup> and concordant cultural narratives<sup>106</sup>. Accordingly, policy recommendations derived from self-determination theory emphasize the unconditional fostering of autonomous motivation by providing the experience of choice, and by providing enough information for autonomous choice<sup>107</sup>.

However, according to a multilevel perspective, an emphasis on individual autonomy without the parallel consideration of possible structural constraints might be incomplete or even misguided (for a seminal discussion, see <sup>108</sup>), and the resulting recommendations for policy-making might fall into the i-frame trap<sup>32</sup>. Specifically, assuming that simply providing people with information and encouraging them to realize their autonomous potential for self-control is sufficient to address societal issues of overconsumption (for example, of unhealthy or unsustainable products) underestimates the limits of rational decision-making and willpower in contexts in which consumers face an uphill battle characterized by strong structural constraints that impact choice and behaviour. For instance, emphasizing individual autonomy for leading a low-carbon lifestyle and focusing on programs designed to educate and motivate people to minimize their carbon footprint to mitigate climate change might divert attention and efforts away from substantial transformations to the larger structural factors that render leading such lifestyles difficult to accomplish<sup>32</sup> (see **Box 1**)

Rather, what seems needed in such contexts is an awareness of external constraints (and how they inconspicuously diminish autonomy) and a vision for how these constraints could be changed for the better. An external (rather than internal) focus could lead to a shift in attributions of responsibility for the behavioural problem at hand<sup>109</sup>. This in turn might trigger more collective and/or political forms of behaviour (rather than individual strivings), such as coalition-building and demand and support for effective systemic or political solutions<sup>109</sup>. For example, individuals who are disappointed with how the food choice options at work are at odds with goals to reduce meat consumption might organize a coalition to request more vegan options in the company cafeteria from management. The addition of more vegan options in the cafeteria might, in turn, influence the meal selection of co-workers, even those harboring low prior levels of vegetarian meal selection<sup>58</sup>, attesting to the role of altered environments in guiding behavior.

Regarding the complex problem of autonomy and empowerment for self-control, one important issue for basic and practical research is assessing and facilitating calibration of people's

efficacy perceptions for environmental control in a specific context of interest. Again, such an analysis cannot advance without a broader recognition and analysis of factors that shape the given choice context at various levels of analysis. Such a broadened perspective could bring the field in closer contact with the literatures on power, collective action, and public policy support.

### ***Self-control and public policy support***

As the above reasoning implies, how individual self-control intersects with public policy could become a new hot spot in self-control research. In many ways, public policy support might constitute an ideal conceptual bridge between individual and macro levels of analysis. Public policy support is an individual attitude or behaviour. However, it encompasses how the individual relates to the possibility of politically addressing the system in which self-control issues are embedded. Such policy measures vary on a continuum of regulatory strength or intrusiveness<sup>110</sup>. At one end, the government is not (supposed to be) involved in regulating individual behaviour; at the other end, the government strongly regulates behavioural options via strict product or health standards, bans, and laws. Between these extremes are ‘softer’ public policy tools such as informing citizens about behavioural risks, nudging (for example, product labels or choice defaults), or various incentives or disincentives such as subsidies or consumption taxes. Generally speaking, the more intrusive a given policy tool, the more it intervenes with notions of individual freedom, but the more effective it is in addressing a given public policy problem such as health-related behaviors<sup>108,109,111</sup>.

Under certain conditions, citizens might desire and be more inclined to support more government intervention. These conditions include high (vs. low) problem awareness, high (vs. low) trust in the intervening agent, and high (vs. low) anticipated effectiveness and fairness of the policy measure in question<sup>109,112</sup>. Given strong public support for intervention, political decision-making might be swayed in favour of stronger regulatory policy (**Figure 2A**). For example,

European countries with stronger public support for anti-smoking policy were faster to implement restrictions on public smoking than countries with weaker public policy support<sup>113</sup>.

Thus, a multilevel approach to self-control suggests that there might be important new forms of behaviours that transcend private-sphere consumption (see for a parallel argument in models of pro-environmental behaviour). Public-sphere behaviours (such as support for proposed transformative policy and social protest or collective action) might help promote self-control indirectly for a potentially large number of citizens via the political changes they might help bring about. Assuming that public policy support is crucial for transformative system-level change, and given that public acceptability of effective (albeit more intrusive) policies is often low<sup>111</sup>, future research should examine what can be done to increase public acceptability of such measures. Framed differently, future research should identify which factors increase people's desire for government regulation in domains that challenge self-control.

Research in the past 2 years reveals an intriguing connection between policy support and people's satisfaction with their self-control performance, such that those reporting more dissatisfaction with attempts to reduce meat consumption were also more supportive of policies that increase meat prices to reduce its consumption<sup>114</sup>. Presumably individuals seek to 'outsource' self-control to institutional or governmental regulators in contexts where they perceive individual shortcomings and believe that these problems could be effectively addressed by a more powerful agent such as the government<sup>109</sup>. In other words, appreciating that a vexing societal problem such as obesity might not be easily solved and cannot be mitigated through reliance on individual responsibility alone could result in a stronger desire for the government to actively step in. This desire for governmental intervention, in turn, should result in greater acceptance of appropriate public policy tools that increase (vs. decrease) access to and affordability of healthy (vs. unhealthy) foods via higher product standards for manufacturers, nutrition labelling, restrictions on marketing of unhealthy foods, altered fiscal and price policies (taxation and incentives), bans and prohibitions,

and the design of public food procurement policies that support healthy diets in environments such as schools, childcare centres, hospitals and residential care settings<sup>115</sup>.

In summary, there is a potential for self-control researchers to help deepen understanding of how underlying social structures shape self-control outcomes via research connecting individual-level factors with public policy research. Such efforts could lead to a better understanding of when and why individuals—particularly those with self-control problems—support public policies to alter structures that are at least partially responsible for these problems.

## **Conclusion**

A multilevel approach to self-control transcends the traditional individual focus in the field by taking into account how individuals shape the microenvironments they navigate as well as how individuals' microenvironments are themselves shaped by other agents at the micro, meso, and macro (system) level of analysis. Notably, a multilevel approach explicitly acknowledges the potentially large role of political institutions and corporate interests in influencing individuals' self-control outcomes by affecting the availability, salience, proximity, affordability, and normativeness of choice options in people's microenvironments.

A multilevel approach might incur at least three key benefits for the next generation of self-control research. First, although the proposed approach does not question the importance of individual-level variables, it is not blind to the influence of the micro, meso and macro environments in which individual behaviour occurs. Combining levels of analysis will result in (necessarily) more comprehensive and complex—but also more predictive—models of the determinants of self-control outcomes. Thus, a multilevel approach circumvents both the compositional fallacy (drawing conclusions about macro-level factors from individual data) and the ecological fallacy (drawing conclusions about individuals from macro-level data alone)<sup>100</sup>.

Second, a multilevel approach might raise awareness of structural influences among researchers, research participants, consumers of the academic and/or popular science literature on

self-control, and decision-makers involved in matters of self-control. Greater awareness of structural influences among researchers could reshape the way findings are situated in scientific publications (particularly general discussion sections) and communicated to the broader public, and vis-à-vis public policy makers. A more balanced allocation of responsibility—away from the pervading individualizing narrative surrounding self-control—could also increase public support for policies that seek to address societal self-control problems, and that more carefully weigh corporate (monetary) against public (health) interests.

Finally, because no individual discipline may be able to conceptually embrace all levels of analysis equally well, a multilevel approach will thrive best when psychology teams up, across siloes of thinking, with neighbouring disciplines such as sociology, economics, political science, and the medical sciences. In addition, a multilevel approach might benefit immensely from including stakeholders who hold power over the structures that influence people's self-control outcomes. Thus, pursuing a multilevel approach might facilitate a more diverse, integrative, societally applicable, and transdisciplinary science of self-control.

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**Table 1.** Juxtaposition of the individual approach and multilevel approach to self-control

|   | <b>Individual approach</b>   | <b>Multilevel approach</b>   |
|---|--|--|
| <b>Explanatory focus</b>                    | <p>Individual self-control outcomes are determined by intraindividual variables relating to the endorsement of and advancement of self-control goals.</p> <p>Refers to essentialist concepts such as willpower or self-discipline.</p>   | <p>Individual self-control outcomes are strongly influenced by structural aspects of the immediate microenvironment individuals are embedded in.</p> <p>Microenvironments might be actively shaped by individuals in accordance with their self-control goals and/or pre-structured at a higher level by cultural, political and economic factors outside of individual control.</p> <p>Focuses on structure and shaping.</p>  |
| <b>Primary research agenda</b>              | <p>To better understand the influence and interplay of intraindividual determinants.</p> <p>To identify individual-level determinants that best predict self-control outcomes.</p>   | <p>To better understand the interplay among structural and individual factors (active shaping vs. being shaped).</p> <p>To identify key predictors at each level of analysis for the optimal prediction of self-control outcomes.</p>  |
| <b>Example research approaches</b>          | <p>Surveys, experimental research (for example, the delay of gratification paradigm), field research</p>   | <p>Multilevel approaches that connect levels of analysis, big data approaches, natural experiments, simulations</p>  |
| <b>Significance of self-control failure</b> | <p>Self-control failures are characterized as individual weakness, connected to guilt and shame.</p>   | <p>Self-control failures are potentially indicative of problematic microenvironments antagonistic to individuals' best interests, pre-structured by factors outside of individual responsibility.</p>  |
| <b>Example interventions</b>                | <p>Interventions that target individuals include increasing problem awareness through information campaigns; coaching, boosting, or training 'willpower'; prosthetic public policy solutions (such as nudging people to overcome individual weaknesses); and helping people to manage and cope with their problem within a given system.</p> | <p>Interventions that target individuals (in addition to common individual-level interventions) include increasing awareness of opportunities for active shaping of the environment and increasing awareness of systemic influences of behaviour.</p> <p>Interventions that target the system include coalition building and collective action; advancing strong public policy making (for example, protective measures such as strict standards and bans); and empowering decision-makers to enact systemic change.</p> |

## Figure captions

**Figure 1. The effect of high versus low trait self-control on choice environments.** Compared to low trait self-control individuals, high trait self-control individuals exhibit a greater tendency to actively navigate into and shape stimulus environments in contexts that allows for a sizeable impact of individual autonomy because there is limited influence from higher level factors.

**Figure 2. The effect of strong versus weak regulation on choice options.** a) Strong government regulation, backed by public policy support from a majority of individuals, controls the impact of corporate interests (in this example of the fast food industry) on environments while incentivizing healthy food supply, resulting in predominantly healthy choice options in individuals' microenvironments. b) Weak government regulation of corporate interests (the status quo in most countries) results in microenvironments replete with unhealthy choice options.

Please note: Both figures are not part of this postprint but can be provided upon personal request via Email.

### **Box 1: Climate behaviour and self-control**

Environmental behaviours that could address the urgent climate crisis are not commonly framed in terms of self-control. However, many individual-level choice dilemmas in this area could be framed in terms of a motivational conflict between self-interests and collective (prosocial) interests on the social dimension and short-term and future interests on the temporal dimension<sup>116</sup>. Examples of such conflicts include refraining from meat consumption (if one likes to eat meat) to reduce one's personal climate impact, taking a (more expensive and slower) train to a conference instead of taking a cheap and quick flight, purchasing (more expensive) green consumption products instead of cheaper but unsustainable options, or keeping one's thermostat at a 'barely' comfortable level to conserve energy (and money) instead of keeping it at higher, more comfortable (but also more resource-intensive) levels. These conflicts are reflected in common public discourses on how shifting individual behaviour might require abstaining from some level of comfort or incur some personal sacrifice<sup>117</sup>. Furthermore, a common discursive argument against individual-level change in environmental behaviour is that individual-level change might make a negligible impact given the behaviour of so many others (and indeed no one wants to be a 'sucker' for foregoing desirable behaviours when others are not).

Such proenvironmental behaviours and the associated discourses perfectly exemplify the social dilemma<sup>118</sup> nature of the climate change problem<sup>116,117</sup>. Most important for the current discussion, these discourses highlight how the broader political, economic, and cultural macro-level aspects which provide the background for prevailing social practices and entrenched social norms of consumption are often blocked from view. This negligence is reminiscent of the iconic parable in David Foster Wallace's speech, "This is Water"<sup>119</sup>:

*There are two young fish swimming along, and they happen to meet an older fish swimming the other way, who nods at them and says, "Morning, boys. How's the water?" And the two young fish swim on for a bit, and then eventually one of them looks over at the other and goes, "What the hell is water?"*

Indeed, climate mitigation behaviours constitute a paradigmatic case for a constellation in which individuals' microenvironments of available choice options are heavily influenced by structural factors, such as the ubiquitous availability of unsustainable products, strong incentives supporting fossil-fuel-based production, and a lack of regulation, resulting in so-called carbon lock-ins<sup>120</sup>. A problem of this scale must therefore be addressed through political solutions that tackle structural rather than individual-level factors that guide producers and consumers toward sustainable practices<sup>32,121</sup>. These policy solutions could include incentives for sustainable production, increased product standards for unsustainable products, and penalties and bans for unsustainable practices such as removing subsidies or leveraging an effective carbon tax<sup>121</sup>. Unfortunately, powerful vested interests continually obstruct such policies from being implemented effectively<sup>122</sup>.

In sum, a complete understanding of the everyday struggles involved in changing individual behaviours and lifestyles cannot not be achieved without considering the political boundary conditions that ultimately shape individual choice situations and stimulus environments. And neither can the required behavioural changes be brought about at scale without systemic transformations that re-shape the choice environments that propagate existing practices.