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# Moral disciplining: The cognitive and evolutionary foundations of puritanical morality

Léo Fitouchi\*

Institut Jean Nicod, Département d'études cognitives, ENS, EHESS, PSL University, CNRS, Paris, France

\*Corresponding author

[leo.fitouchi@gmail.com](mailto:leo.fitouchi@gmail.com)

<https://sites.google.com/view/leofitouchi>

Jean-Baptiste André†

Institut Jean Nicod, Département d'études cognitives, ENS, EHESS, PSL University, CNRS, Paris, France

[jeanbaptistrandre@gmail.com](mailto:jeanbaptistrandre@gmail.com)

<http://jb.homepage.free.fr/>

Nicolas Baumard†

Institut Jean Nicod, Département d'études cognitives, ENS, EHESS, PSL University, CNRS, Paris, France

[nbaumard@gmail.com](mailto:nbaumard@gmail.com)

<https://nicolasbaumards.org/>

† These authors contributed equally

## Short abstract

Why do many human societies morally condemn apparently victimless and pleasurable behaviors, such as lust, gluttony, drinking, drugs, gambling, or even music and dance? Why do they morally praise temperance, chastity, sobriety, decency, and piety? While this puritanical morality often appears as an exception to the cooperative function of moral cognition, we propose that it stems, like other moral concerns, from moral judgements targeting cooperative challenges. Specifically, we propose that it consists of preemptive moralizations of behaviors perceived as risk factors for uncooperative self-control failures, impeding people's ability to resist the short-term temptations naturally conflicting with cooperative motivations.

## Long abstract

Why do many societies moralize apparently harmless pleasures, such as lust, gluttony, alcohol, drugs, and even music and dance? Why do they erect temperance, asceticism, sobriety, modesty,

and piety as cardinal moral virtues? According to existing theories, this puritanical morality cannot be reduced to concerns for harm and fairness: it must emerge from cognitive systems that did not evolve for cooperation (e.g., disgust-based “Purity” concerns). Here, we argue that, despite appearances, puritanical morality is no exception to the cooperative function of moral cognition. It emerges in response to a key feature of cooperation, namely that cooperation is (ultimately) a long-term strategy, requiring (proximately) the self-control of appetites for immediate gratification. Puritanical moralizations condemn behaviors which, although inherently harmless, are perceived as indirectly facilitating uncooperative behaviors, by impairing the self-control required to refrain from cheating. Drinking, drugs, immodest clothing, and unruly music and dance, are condemned as stimulating short-term impulses, thus facilitating uncooperative behaviors (e.g., violence, adultery, free-riding). Overindulgence in harmless bodily pleasures (e.g., masturbation, gluttony) is perceived as making people slave to their urges, thus altering abilities to resist future antisocial temptations. Daily self-discipline, ascetic temperance, and pious ritual observance are perceived as cultivating the self-control required to honor prosocial obligations. We review psychological, historical, and ethnographic evidence supporting this account. We use this theory to explain the fall of puritanism in WEIRD societies, and discuss the cultural evolution of puritanical norms. Explaining puritanical norms does not require adding mechanisms unrelated to cooperation in our models of the moral mind.

**Keywords:** cooperation, morality, modesty, self-control, sobriety, pleasure, puritanism, purity, temperance, temptation, sin

# 1. Introduction

Brueghel's 1559 painting *The Fight Between Carnival and Lent* contrasts the vices and virtues of puritanical moral standards. On one side of the painting, "men and women dance, they crowd into a tavern, get drunk, play games, watch street theatre, ignore beggars, sneak inside for sex, play cruel tricks on others, gamble, eat, join masked processions, and make music; in short, they are unruly, profane, sexually promiscuous, spontaneous, and concerned with immediate gratification" (Martin, 2009, p. 9). On the other side of the painting, other "men and women work, attend church, give alms to beggars and the poor; in short they are orderly, sober, devout, and disciplined" (Martin, 2009, pp. 9–10). This side represents the values of "decency, diligence, gravity, modesty, orderliness, prudence, reason, self-control, sobriety, and thrift" (Burke, 1978, p. 213).

In recent decades, moral psychologists have identified a related cluster of moral norms. They have noted that many human societies praise chastity, temperance, and piety; condemn the immoderate enjoyment of sensual pleasures; and disapprove of the lack of religious and ritual observance (Graham et al., 2013; Haidt, 2012, 2007; Haidt & Joseph, 2007; Shweder et al., 1987, 1997). This constellation of moral values gained popularity in psychological and evolutionary approaches to morality as part of the so-called "Purity" moral concerns (Graham et al., 2013; Haidt, 2012, 2007; Haidt & Joseph, 2004, 2007). The Purity category, however, is a murky concept with no clear definition (Crone, 2022; Gray et al., 2022; Kollareth et al., 2022).

Reviewing 158 papers of the Purity literature, Gray et al. (2022) show that moral psychologists understand Purity in about nine different ways, often mixing distinct meanings in their definitions and operationalizations. To avoid confusions, we here use the term *puritanical morality* (or "puritanism") to refer to the ascetic, austere moralization of apparently victimless pleasures that humans crave for, such as eating, drinking, feasting, dancing, gambling, taking drugs, dressing indecently, having sex, or masturbating.

Puritanical morality, more precisely, comprises the following constellation of moral norms:

1. A moral condemnation of *bodily pleasures*. Christian morality, for example, condemns excessive indulgence in food and sex as the deadly sins of gluttony and lust (Dabhoiwala, 2012; Hill, 2011; Adamson, 2004). Psychologists have observed that many participants moralize unrestrained or unhealthy eating (Fitouchi et al., 2022; Ringel & Ditto, 2019; Steim & Nemeroff, 1995; Mooijman et al., 2018), as well as sexual indulgences such as

masturbation or oral sex (Fitouchi et al., 2022; Haidt et al., 1993; Haidt & Hersh, 2001; Schein et al., 2016).

2. A strong valorization of *temperance* and *self-discipline*. In various countries, a substantial share of participants moralize lack of self-control (Mooijman et al., 2018), general hedonism (Saroglou & Craninx, 2021), and reluctance to needless effort (Celniker et al., 2022; Tierney et al., 2021), while similar values are preached across world religions (see section 1.1.). In medieval and early modern Western societies, for instance,

self-discipline in all spheres of life was prized as the ultimate mark of civilization (...) Only beasts and savages gave 'unrestrained liberty' to 'the cravings of nature' – civilized Christians were rather 'to bring under the flesh; bring nature under the government of reason, and, in short bring the body under the command of the soul. The mental and physical government of fleshly appetites was the very foundation of the whole culture of discipline. (Dabhoiwala, 2012, pp. 26–27).

3. Condemnations of entertainments such as alcohol, drug use, gambling, and certain forms of music and dances. These are widespread both in cross-national surveys (Lugo et al., 2013; Poushter, 2014; Weeden & Kurzban, 2013), and in the explicit moral codes of various societies (e.g. *Buddhism*: Sterckx, 2005, pp. 223-224; Najjar et al., 2016; *Hinduism*: Doniger, 2014, pp. 263-270; *traditional Europe*: Martin, 2009; Wagner, 1997; Burke, 1978; Partridge & Moberg, 2017; *Arab-Muslim societies*: Otterbeck & Ackfeldt, 2012; Michalak & Trocki, 2006).
4. Moral demands of *modesty*, which regulate decency in clothing, speech, and attitudes. In traditional Arab-Muslim societies, for example, when entering the public sphere, women must be veiled, lower their gaze, and avoid body ornaments (Antoun, 1968; Beckmann, 2010; Mernissi, 2011), while similar restrictions appear in other puritanical cultures (e.g., Puritans' austere clothing: Bremer, 2009; Hindu India: Stephens, 1972, p. 4; Jewish *Tznihut* dress: Andrews, 2010; Ancient Christian veiling: Tariq, 2013).
5. Moral prescriptions of a *pious lifestyle*, requiring the diligent observance of religious rituals, such as fasting, daily prayers, meditations, effortful pilgrimages, or dietary restrictions (see section 1.1).

This definition of puritanism comprises many core elements of Purity, which is often defined by moral psychologists as including moralizations of lust, gluttony (Haidt & Graham, 2007; McAdams et al., 2008), clothing, prayer, meditation, temperance, self-control (Graham et al., 2009; Horberg et al., 2009; Koleva et al., 2012), drugs, alcohol, and certain kinds of music (Helzer & Pizarro, 2011; Horberg et al., 2009)—all of which are central to puritanism as defined here. However, because of its heterogeneity (Kollareth et al., 2022), the Purity category is broader than puritanism as we define it. In particular, Purity also includes concerns for physical contamination, often operationalized by weird or abnormal behaviors (Gray & Keeney, 2015; Kupfer et al., 2020), such as pouring urine on oneself (Chakroff et al., 2017), touching poop barehanded (Dungan et al., 2017), or eating pizza off a dead body (Clifford et al., 2015). We do not include this subclass of Purity in our definition of puritanism because, as researchers have noted, these contamination-related concerns appear distinct from those labelled here as puritanical (Crone, 2022; though see Section 6.1.1).

Why, then, do many societies develop puritanical values? Answering this question requires resolving two puzzles.

### **1.1. The puzzle of association**

First, puritanism consists of apparently heterogenous moral concerns, governing domains as various as sex, food, clothing, self-discipline, entertainments, and ritual observance. Yet despite their heterogeneity, these moral concerns tend to co-occur and cohere in the most culturally successful moral traditions, which cover almost 80% of the world's population (Hackett & McClendon, 2017)—from Hinduism (Doniger, 2014, pp. 363–370; Hatcher, 2017; Menon, 2013; Nag, 1972, p. 236; Stephens, 1972, p. 4; Vatuk & Vatuk, 1967, pp. 108–112) to Christianity (Bremer, 2009; Burke, 1978; Dabhoiwala, 2012a; Gaca, 2003; Gorski, 2003; Partridge & Moberg, 2017; Spiegel, 2020a; Wagner, 1997) to Buddhism (Harvey, 2000; Keown, 2003, pp. 78, 93; Mann, 2011; Sterckx, 2005, pp. 223–224; Stunkard et al., 1998) to Chinese religions (Brokaw, 2014; Csikszentmihalyi, 2009; Slingerland, 2014, p. 76; Suiming, 1998; Tiwald, 2020; Yü, 2021, pp. 36–40, 82, 216) to Arab-Muslim societies (Garden, 2014, pp. 83, 89, 76; Mernissi, 2011; Michalak & Trocki, 2006; Otterbeck & Ackfeldt, 2012, pp. 231–233; Rehman, 2019) and Ancient Greco-Roman spiritualities (Gaca, 2003; Langlands, 2006).

This association, suggested by qualitative data, is consistent with psychological evidence. Studies find that moralizations of gluttony, sexual indulgences, lack of self-control, intoxicant use, and

certain types of music, are intercorrelated (Fitouchi et al., 2022; Gay, 2000; Kurzban et al., 2010; Mooijman et al., 2018; Quintelier et al., 2013; Steim & Nemeroff, 1995; Tierney et al., 2021). Condemnations of lack of self-control, intoxicant use, hedonism, sexual indulgences, and immodesty are all associated with religiosity (Grubbs et al., 2015; Jacquet et al., 2021; Mooijman et al., 2018; Moon et al., 2021; Najjar et al., 2016; Saroglou & Craninx, 2021; Stylianou, 2004; Weeden & Kurzban, 2013), which is itself related, across countries, to the moralization of piety (Abrams et al., 2020; Tamir et al., 2020). At a deeper level, experimental evidence indicates that different puritanical norms are intuitively intertwined in people's mind. Experimental studies of "implicit puritanism" across cultures ( $N > 6000$ ) show that Indian, American, Australian, and English participants all implicitly associate violation of one puritanical norm (work-related self-discipline) with violations of another puritanical norm (sexual restraint), by misremembering individuals described as violating one norm as also violating the other (Tierney et al., 2021).

Hence the first puzzle of puritanism: Why do moralizations of bodily pleasures, self-discipline, entertainments, clothing, and piety often develop in concert?

## **1.2. The puzzle of morality without cooperation**

The second puzzle of puritanical morality concerns its relation to cooperation. Most evolutionary theories of morality share the ultimate hypothesis that moral cognition is an adaptation to the challenges of cooperation recurrent in human social life (Alexander, 1987; André et al., 2022; Baumard et al., 2013; Boehm, 2012; Curry, 2016; Haidt, 2012; Stanford, 2018; Tomasello, 2019). This hypothesis explains the vast majority of moral intuitions and norms found across human societies, such as condemnations of theft, murder, violence, unfairness, and the promotion of justice, loyalty, reciprocity, or respect for property and authority (Baumard, 2016; Boehm, 2012; Curry et al., 2019; Hofmann et al., 2014; Purzycki et al., 2018).

In this context, puritanical morality appears as an "odd corner of moral life" (Haidt & Joseph, 2004, p. 60). If moral cognition evolved for cooperation, moral condemnations should only target cheating behaviors, such as lying, theft, free-riding, betrayal of coalition partners, or suffering inflicted on innocent people. Yet, the behaviors typically moralized by puritanical values are not, at first sight, clearly related to cooperation. For example, in medieval Christianity (Dabhoiwala, 2012), Neo-Confucian China (Suiming, 1998, p. 16), or Victorian England (Seidman, 1990), indulgence in sexual pleasure is condemned not only when it amounts to

cheating other people in a cooperative interaction, such as in adultery<sup>1</sup>, but also in a range of victimless manifestations, such as in masturbation, or too frequent or licentious sex within marriage:

A huge body of teaching grew up in support of the notion that bodily desire was inherently shameful and sinful ... Even in marriage, men and women had to be constantly on their guard against sinning through immoderate, unchaste, or unprocreative sex. (Dabhoiwala, 2012, pp. 7–8).

In moral psychology, famous vignettes studies have echoed this apparent harmlessness of sexual sins, finding that American and Brazilian participants condemn “purity violations,” such as masturbating in a chicken carcass, even though these actions do not in themselves cause any harm to other individuals (Haidt et al., 1993; Haidt & Hersh, 2001; Horberg et al., 2009).

Similarly, puritanical values condemn immoderate indulgence in food pleasure, even when gluttony doesn’t involve failing in one’s duty to share food, or to respect others’ property (e.g., Medieval Christianity: Hill, 2011; Adamson, 2004; India: Vatuk & Vatuk, 1967; European Antiquity: Coveney, 2006; Gaca, 2003). The Christian sin of gluttony, for example, condemns the failure to control the food appetite in itself—whether by eating too much, failing to wait for the proper time to eat, eating too eagerly, or craving foods that are too tasty (Adamson, 2004; Hill, 2007, 2011). Psychologists, too, observe that participants moralize inherently harmless eating practices, such as eating fatty rather than healthy foods (Fitouchi et al., 2022; Mooijman et al., 2018; Oakes et al., 2004; Steim & Nemeroff, 1995).

Besides food and sex, puritanical values prescribe industrious self-discipline even when idleness would be harmless and effort unproductive (Indian, American, Australian, and English

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<sup>1</sup> Adultery is an instance of cheating in the context of pair-bonding and marriage—a cooperative interaction on reproduction, resource production, and parental investment (Gurven et al., 2009). Committed pair-bonds enjoy mutual benefits of parental certainty and greater efficiency in child care (Chapais, 2009; Gurven et al., 2009). Yet, just as in other cooperation dilemmas (Rand & Nowak, 2013), they also face short-term incentives to cheat by taking advantage of their partner’s exclusive provision of benefits (fidelity), while not reciprocating it to reap the benefits of extra-pair mating (see Buss & Schmitt, 1993; Gangestad & Simpson, 2000). Adultery, thus, amounts to take the benefits of one’s partner cooperation (fidelity) while not oneself paying the costs of cooperation (by oneself remaining faithful)—and is accordingly nearly universally condemned (Broude & Greene, 1976; Murdock, 1949; Poushter, 2014). This is not to deny the often-patriarchal nature of adultery proscriptions, which often sanction female’s infidelity more strongly than male adultery (Broude & Greene, 1976), and often take the form of prohibitions for men to steal each other’s wife, treating women as the property of their husband, father, or brothers (Dabhoiwala, 2012a, p. 5). Such patriarchal norms are likely grounded in males’ interests to police female sexuality (see section 2.2.).



participants: Tierney et al., 2021; Uhlmann et al., 2011; American and South-Korean participants: Celniker et al., 2022; Early modern China: Yü, 2021). They condemn alcohol, drugs, and gambling, when the latter are widely considered “victimless crimes” (Boyd & Richerson, 2001; Ellis, 1988; Stylianou, 2010). And their strict regulations of mundane activities, such as music, dance, or clothing appear, to our modern eyes, as needlessly austere restrictions (see Moon et al., 2021).

Hence the second puzzle of puritanism: If the function of morality is cooperation—as the prominence of cooperative norms in the human moral landscape suggests (Curry, Mullins, et al., 2019; Hofmann et al., 2014; Purzycki et al., 2018)—why do humans moralize victimless lifestyle choices with respect to sex, food, drinking, clothing, self-discipline, and ritual observance?

This apparent disconnect between puritanical morality and cooperation has sparked intense debates about the cognitive architecture of morality, opposing unitary models of moral cognition to theories dividing morality into distinct cognitive domains (Beal, 2020; Graham et al., 2013; Schein & Gray, 2018). Unitary theories argue that all moral judgements are produced by a single, functionally unified cognitive mechanism. In particular, the Theory of Dyadic Morality maintains that all moral judgements stem from perceptions of dyadic harm—i.e., from perceptions that an ‘agent’ intentionally causes suffering to a ‘patient’ (Gray et al., 2012, 2014; Schein & Gray, 2015, 2018). Other unitary theories argue that all moral judgements are outputs of fairness computations, tracking violations of mutual benefit between cooperative partners (André et al., 2022; Baumard, 2016; Fitouchi et al., 2021b)<sup>2</sup>. By contrast, theories based on distinct cognitive domains—such as Moral Foundations Theory—maintain that moral cognition is composed of multiple, functionally distinct, domain-specific mechanisms, some of which track stimuli unrelated to harm or fairness (Graham et al., 2013). In these debates, Purity moralizations have appeared as critical arguments against unitary theories. If harmless behaviors can be morally condemned, scholars have argued, there must be in the mind some mechanisms that generate moral judgements despite not functioning for cooperation (Haidt, 2012). Accordingly, puritanical morality has so far been explained by psychological mechanisms unrelated to cooperation, such as pathogen-avoidance and conflicts of reproductive interests (see section 2).

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<sup>2</sup> Not all cooperation-based theories of morality are unitary, and not all unitary theories are cooperation-based. Some theories, such as the Morality-As-Cooperation framework (Curry, 2016), view morality as functioning entirely for cooperation, yet slice morality into multiple domains corresponding to distinct domains of cooperation (see also Cosmides et al., 2018). Conversely, some theories maintain that morality did not evolve for cooperation, but rather to advance condemners’ self-interest, yet regard morality as a functionally unitary cognitive mechanism (DeScioli & Kurzban, 2009, 2013).

### 1.3. The moral disciplining theory of puritanism

Here, we propose that puritanical morality does target cooperation, and is reducible to concerns for harm or fairness. Psychologists and evolutionary scientists have long noted that reciprocal and reputation-based cooperation require self-control—the ability to delay gratification, by resisting temptations of immediate rewards (Axelrod, 1984; Ainslie, 2013; Manrique et al., 2021; Stevens et al., 2005; Hofmann et al., 2018). Historians and social scientists, meanwhile, have repeatedly stressed that puritanical groups seem obsessed with the cultivation of self-control (Csikszentmihalyi, 2009; Dabhoiwala, 2012; Eisner, 2014; Gaca, 2003; Gorski, 2003; Luttmer, 2000; Menon, 2013; Oestreich, 1982; Rehman, 2019; Seidman, 1990; Spiegel, 2020; Walzer, 1963, 1982; Weber, 1968; Yü, 2021). Connecting these insights, we propose that puritanism develops from folk-psychological beliefs that restraining indulgence in victimless pleasures would improve people’s self-control, thus facilitating cooperative behaviors.

Our argument goes as follows. People perceive that meeting prosocial obligations often requires self-control (section 3.1.) Refraining from violent behaviors, they perceive, sometimes requires resisting aggressive impulses. Abstaining from adultery sometimes requires resisting sexual temptations. In collective work, doing one’s fair share of effort can require overcoming lazy desires. Meanwhile, people perceive, not only that cooperation requires self-control, but also that some behaviors *alter* self-control (section 3.2.). They perceive that alcohol and drugs make people impulsive, precipitating antisocial behaviors—such as adultery, violence, or lazy free-riding—by impeding abilities to resist impulses. They see carnal pleasures—lust, gluttony, intoxicants, gambling—as dangerously addictive behaviors, overindulgence in which would make people slave to their urges, and unable to resist uncooperative temptations. By contrast, daily self-discipline, ascetic temperance, and regular ritual observance are perceived as improving people’s self-control, thus ensuring that they remain peaceful neighbors, faithful husbands and wives, industrious workers, responsible family members, or conscientious followers. Thus, while inherently harmless, hedonistic behaviors are perceived as *indirectly* socially harmful. As such, they are naturally tagged as morally wrong by cognitive systems biologically evolved to detect and condemn uncooperative behaviors or threats to cooperation (section 3.3.). Puritanical moral judgements are thus generated by the same, cooperation-based cognitive systems producing the rest of human morality.

These intuitive psychological processes, in turn, shape the cultural evolution of puritanical norms (section 3.4). In environments where many people want to prevent perceived antisocial effects of hedonistic impulses, people gradually invent and refine cultural technologies they perceive as efficient for *disciplining* other individuals to ensure social order. These technologies of moral self-discipline include ascetic rituals, modest clothes, legal regulations of entertainment such as drinking and feasting, as well as mental techniques for the self-monitoring of impulses (see section 6.1.2). Our account, importantly, is agnostic as to whether puritanical norms are objectively effective in improving self-control and cooperation—it rather insists on people’s *perceptions* that they are.

In the following, we first review and examine existing accounts of puritanical morality (Section 2). Section 3 lays out the evolutionary and psychological foundations of the moral disciplining theory of puritanism, and reviews evidence for its assumptions. We then derive predictions from this account, review current evidence supporting them, and outline avenues for further testing (Section 4). We finally use this theory to explain the fall of puritanism in WEIRD societies (Section 5), and discuss extensions and outstanding questions for the study of puritanical values (Section 6).

## **2. Existing accounts of puritanical morality**

### **2.1. Moral Foundations Theory and disgust-based accounts**

Moral Foundations Theory considers puritanical morality as an exception to the cooperative function of moral cognition (Graham et al., 2013; Haidt, 2012; Haidt & Joseph, 2007). According to this framework, moral cognition is composed of several domain-specific cognitive systems, most which have evolved for cooperative adaptive challenges—including Harm/Care, Fairness/Reciprocity, Loyalty/Betrayal, and Authority/Respect. The last moral system, Purity/Sanctity, is instead proposed to function for the non-social challenge of pathogen-avoidance, and to emerge from disgust at the proximate level (Haidt & Joseph, 2007). People driven by carnal impulses rather than spiritual motivations would be detected by this disgust-related system as “impure” and “less than human,” and thus morally condemned (Haidt & Graham, 2007, p. 9). While this theory is consistent with the frequent cultural depiction of pleasure-seeking behaviors as “impure,” it seems insufficient to explain puritanical morality, for at least two reasons.

First, it is unclear that violations of puritanical standards actually trigger disgust. Initial support for this hypothesis came from “purity violation” studies, in which participants find apparently harmless behaviors (e.g., masturbating in a chicken carcass) both disgusting and morally wrong (e.g. Haidt et al., 1993; Haidt & Hersh, 2001; Horberg et al., 2009; Rozin et al., 1999). However, containing more pathogen cues than the typical targets of puritanical moralizations, such vignettes appear disconnected from real-world puritanical concerns. As such, they are likely to overestimate the extent to which real-world violations of puritanical standards evoke disgust. For example, in widely cited studies, sexual lust takes the form of masturbating in a *dead chicken* (Haidt et al., 1993; Horberg et al., 2009) or *corpse-sexing* (Haidt & Hersh, 2001). Gluttony becomes eating one’s *dead dog* (Haidt et al., 1993), or *rotten* meat (Rozin et al., 1999). By contrast, historical and anthropological data make clear that puritanical societies are less morally obsessed by disgusting sexualities with dead animals than with the sin of lust as the *unbridled craving for sexual pleasure* (Dabhoiwala, 2012; Gaca, 2003; Le Goff, 1984; Mernissi, 2011; Seidman, 1990). For example, medieval Christian moralists (e.g., Augustine, 4-5<sup>th</sup> c., Aquinas, 13<sup>th</sup> c.) regarded the peculiar problem of the sin of lust to be “the intensity of the pleasure it offers” (Sweeney, 2012, p. 96), and its resulting “unparalleled power to overwhelm reason and human will” (Dabhoiwala, 2012, p. 8). In the same vein, the sin of gluttony condemns the immoderate indulgence in the *pleasure* of eating (Adamson, 2004; Bynum, 2000; Hill, 2007, 2011), not the eating of rotten aliments or animal corpses. In fact, pleasurable aliments (affording gluttony) are almost by definition aliments that are not disgusting. In line with these ideas, when participants are asked to themselves generate sinful or lustful scenarios, they overwhelmingly mention pathogen-free behaviors (e.g., stripping) (Gray & Keeney, 2015).

Aside from lust and gluttony, moralizations of intemperance, lack of self-discipline, and impiety also seem unrelated to disgust. These behaviors do not involve pathogen-cues at all. Accordingly, maintaining that disgust explains their condemnation has required to argue that this emotion is triggered not only by pathogen cues, but also by “spiritually” impure behaviors, that “degrade” the elevated nature of the human soul or remind humans of their “animal nature” (Haidt & Graham, 2007; Rozin et al., 1999, 2008; Rozin & Haidt, 2013)—an often contested theory (Bloom, 2013; Royzman & Sabini, 2001; Tybur et al., 2013). As many researchers have noted, self-reports of being “disgusted” by “spiritual impurities” (Ritter et al., 2016) do not reliably demonstrate that the cognitive system of disgust is actually activated. The lay meaning of the term “disgust” is difficult to disentangle from “anger” or “contempt” (Herz & Hinds, 2013; Nabi, 2002; Piazza et al., 2018), and people likely use the term metaphorically to communicate

their disapproval (Armstrong et al., 2020; Bloom, 2004; Nabi, 2002; Royzman & Sabini, 2001; Royzman & Kurzban, 2011). In line with this idea, pathogen-free violations of “spiritual purity” are not associated with the facial expression of disgust (Franchin et al., 2019; Ritter et al., 2016); do not elicit a disgust-related phenomenology (nausea, gagging, loss of appetite), nor action tendency (desire to move away) (Royzman et al., 2014); and are not or negligibly associated with reporting being “grossed-out” (Kollareth et al., 2022; Kollareth & Russell, 2019)—the lay term more aptly capturing the cognitively strict sense of disgust (Herz & Hinds, 2013; Nabi, 2002).

Second, disgust-based accounts of puritanism rely on the premise that simply perceiving an action as disgusting is sufficient to judge it immoral. As researchers have noted, however, many behaviors are disgusting without being immoral (Kayyal et al., 2015; Piazza et al., 2018; Pizarro et al., 2011; Schein et al., 2016). It seems, moreover, evolutionarily unclear why disgust should have acquired such a secondary moralizing function (Fitouchi et al., 2021b), and the experimental evidence seems overall to cast doubt on this possibility (Piazza et al., 2018, for an extensive review). In particular, a meta-analysis (Landy & Goodwin, 2015), highly powered replications (Ghelfi et al., 2020; Johnson et al., 2016), and recent studies (Jylkkä et al., 2021) strongly suggest that feelings of disgust do not increase moral condemnation, nor cause moralization of otherwise morally neutral actions. Relatedly, correlations between disgust-sensitivity and condemnations of sex- and purity-related behaviors (Crawford et al., 2014; Horberg et al., 2009; Inbar et al., 2009) have been found to disappear when perceptions of harm are controlled for (Schein et al., 2016; see also Gray et al., 2014; Gray & Schein, 2016), and seem partly due to the more general effect of affective states (not only disgust) on a wide range of (not only moral) judgments (Cheng et al., 2013; Landy & Piazza, 2017).

## **2.2. Self-serving norms and conflicts of sexual strategies**

An important framework posits that moral cognition evolved not to promote cooperation, but to advance the condemner’s self-interest, by recruiting allies to condemn enemies, coordinating side-taking in conflicts, and promoting moral norms advantageous to oneself (DeScioli, 2016; DeScioli et al., 2014; DeScioli & Kurzban, 2009, 2013; Petersen, 2018; Sznycer et al., 2017; Tooby & Cosmides, 2010). Within this framework, researchers argue that some puritanical norms emerge from self-serving attempts by some individuals to promote their reproductive interests at the expense of others’ (Kurzban et al., 2010; Weeden et al., 2008; Weeden & Kurzban, 2016). The Reproductive Religiosity Model argues that a high level of promiscuity in the environment threatens monogamous individuals’ ability to reap the benefits of their

committed, parentally investing reproductive strategy, by increasing the risk of cuckoldry or mate-poaching (Weeden & Kurzban 2016). Monogamous individuals, thus, have an interest in normatively curbing sexual promiscuity. Researchers also argue that males' attempts to control female sexuality explain values of female chastity and modesty, and restrictions aimed at increasing paternity certainty, such as veiling, virginity tests, female clausturation, and menstrual taboos (Becker, 2019; Blake et al., 2018; Dickemann, 1981; Pazhoohi et al., 2017; Strassmann et al., 2012; Strassmann, 1992).

These accounts are not incompatible with the one with propose. Mate-guarding surely underly many sexual restrictions (Strassmann et al., 2012), and is consistent with the frequent double-standard favoring men in the moralization of sexuality (Broude & Greene, 1976; Dabhoiwala, 2012b). Consistent with the Reproductive Religiosity Model, monogamous individuals more harshly oppose sexual promiscuity (Weeden & Kurzban, 2016) and its facilitators (e.g., drugs; Kurzban et al., 2010; Quintelier et al., 2013), and seem to use religion to facilitate and encourage monogamous pair-bonding (Baumard & Chevallier, 2015; Jacquet et al., 2021; Moon, 2021; Moon et al., 2019; Weeden et al., 2008; Weeden & Kurzban, 2013).

However, these accounts fail to sufficiently explain the more general condemnation of hedonic excesses beyond sexuality, such as gluttony (Hill, 2011; Steim & Nemeroff, 1995), drinking, harmless idleness (Tierney et al., 2021), or general lack of self-discipline (Mooijman et al., 2018)—sexual lust is only one of the many pleasure-seeking tendencies that puritanical morality condemns. They also do not account for the condemnation of bodily pleasures as intrinsically sinful, even when they are truly harmless to males or monogamous strategists, such as in frequent sexuality between *monogamous*, married partners (e.g. Dabhoiwala, 2012, pp. 7–9; Seidman, 1990; Suiming, 1988, p. 16), or in solitary masturbation (Seidman, 1990). Besides, puritanical societies moralize not only female lust but male sexual desires as well—an observation inconsistent with the mate-guarding hypothesis (Muslim Zanzibar: Beckmann, 2010; Medieval and early modern Europe: Dabhoiwala, 2012, p. 8; McIntosh, 2002, pp. 73–74; Victorian England: Seidman, 1990).

While manipulative use of moral discourse is surely used to justify oppressive norms (Strassmann et al., 2012), and advance condemners' self-interests (DeScioli et al., 2014; Sznycer et al., 2017), we propose, in the following, that people genuinely perceive puritanical norms as mutually beneficial in the social contexts in which they prevail.

### **3. The moral disciplining theory of puritanism**

We propose that hedonistic behaviors, although inherently victimless, are condemned because they are perceived as indirectly favoring uncooperative behaviors (e.g., aggression, infidelity, free-riding), by altering people’s self-control. This hypothesis assumes that people perceive cooperation as requiring self-control (3.1); that people perceive hedonistic behaviors, such as intoxicant use, bodily pleasures, and undisciplined lifestyles, as reducing people’s self-control (3.2); and that moral cognition is triggered not only by intrinsic instances of cheating, but also by behaviors perceived to indirectly and probabilistically favor socially harmful outcomes (3.3).

#### **3.1. People perceive that cooperation requires self-control**

Before reviewing evidence that people perceive self-control as necessary for cooperative behavior (section 3.1.3.), we argue that this intuition is somewhat justified: central forms of human cooperation—reciprocal and reputation-based cooperation—objectively require delaying gratification (sections 3.1.1. and 3.1.2.). This objective relationship between cooperation and self-control allows explaining why people perceive that cooperation requires self-control in the first place.

##### ***3.1.1. Reciprocal and reputation-based cooperation require delaying gratification***

Cooperation refers to any behavior that benefits another individual (the recipient), and the evolutionary function of which is, at least in part, to benefit the recipient (West et al., 2007, 2011). Some types of cooperation provide immediate inclusive fitness benefits to the actor. This is the case of kin-altruism, whereby the actor automatically increases his indirect fitness (Hamilton, 1964). This is also the case of by-product mutualisms (West et al., 2011), or cooperation for “shared interests” (West et al., 2021), whereby the actor benefits the recipient as a by-product of pursuing his own immediate self-interest (e.g., cooperative hunting in social carnivores; Leimar & Connor, 2003; Leimar & Hammerstein, 2010).

When the actor’s and the recipient’s immediate interests are not fully aligned, however, cooperation requires the actor to invest an immediate cost (to benefit the recipient), that is rewarded only in the future, by greater benefit-provision (or reduced cost-infliction) from the recipient or third-parties—such as through direct reciprocity (Axelrod, 1984; Trivers, 1971), indirect reciprocity (Nowak & Sigmund, 2005; Panchanathan & Boyd, 2004), or partner choice

(Barclay, 2013; Roberts, 2020). In the iterated Prisoner's Dilemma, for example, reciprocal cooperation yields higher payoff than defection only *in the long run*, by securing partners' willingness to reciprocate in subsequent rounds—in the immediate present of each round, cheating pays more than cooperating (Axelrod & Hamilton, 1981; Axelrod, 1984). Using evolutionary simulations, Roberts (2020) shows that the same holds for cooperation under reputation-based partner choice: cooperation is adaptive when the cost of renouncing the immediate benefit of cheating is exceeded, *in the long run*, by the increased probability of being chosen as a partner in subsequent interactions. In other words, because people selectively associate with trustworthy partners, a good reputation can be understood as a capital that yields future benefits at each time step of the rest of an individual's life. Damaging this capital by exploiting others brings immediate benefits (e.g., more resources, sexual opportunities, less effort), yet deprives oneself of all the benefits that a good reputation could have brought *at each later time-point*, by attracting others' cooperative investments (Lie-Panis & André, 2022).

Accordingly, scholars have widely noted that reciprocal and reputation-based cooperation require delaying gratification: individuals must renounce the immediate, smaller reward of cheating to secure the future, larger benefits of cooperating (R. M. Axelrod, 2006; Frank, 1988; Manrique et al., 2021; Roberts, 2020; Stevens et al., 2005). Lie-Panis & André (2022) develop a formal understanding of this idea. In their model, individuals are characterized by a discount rate, and engage in numerous Trust Games during their lifetime, with a certain probability of being observed by others, who transmit reputational information impacting future partner choice. At equilibrium in their model, individuals who cooperate are those who are sufficiently future-oriented, i.e., who discount the future benefit of having a good reputation in the rest of their life little enough for this benefit to outweigh the immediate cost of cooperation.

### ***3.1.2. Cooperation and self-control at the proximate level***

In line with the fact that reciprocal and reputation-based cooperation ultimately require delaying gratification, psychologists have long noted that self-control—the ability to resist temptations of immediate rewards—is likely involved in cooperative decision-making (Ainslie, 2013; Hofmann et al., 2018; Manrique et al., 2021; Stevens et al., 2005). For example, when faced with an attractive mating opportunity, avoiding cheating one's partner requires resisting temptations of immediate sexual pleasure (see Gailliot & Baumeister, 2007). By renouncing this immediate reward, one secures the long-term benefit of preserving one's pair-bonding relationship—a



particular type of cooperative interaction (Gurven et al., 2009)—, as well as one’s reputation as a trustworthy partner. Meeting obligations to share resources with others, similarly, requires resisting the immediate reward of consuming these resources for oneself (Hofmann et al., 2018; Sebastián-Enesco & Warneken, 2015). By resisting this temptation, one secures the larger, future benefits of ensuring reciprocal help, as well as a good reputation. Similarly, avoiding interpersonal conflicts sometimes requires overriding aggressive impulses (see Barton-Crosby & Hirtenlehner, 2021); and doing one’s part in collaborative work requires renouncing immediate leisure or procrastination. We call (i) “temptations to cheat” these impulses for immediate rewards (e.g., food, sex, rest) that conflict with prosocial obligations, and (ii) “moral self-control” the resistance to these temptations to cheat (following Hofmann et al., 2018).

Converging lines of evidence demonstrate this importance of self-control for a wide range of cooperative behaviors. Performance on a delay of gratification task predicts children’s propensity to share resources with others, after controlling for age (Sebastián-Enesco & Warneken, 2015). Focusing on the future rather than immediate consequences of their behaviors makes participants more likely to share with others (Sjåstad, 2019), and less likely to behave unethically (Hershfield et al., 2012; van Gelder et al., 2013; Vonasch & Sjåstad, 2021). Consistent with a trade-off between the immediate benefit of cheating and its future reputational cost, these associations between cooperation and future-orientation are mediated by reputational concern (Sjåstad, 2019; Vonasch & Sjåstad, 2021). Disrupting participants’ right lateral prefrontal cortex—implied in the self-control of impulses for instant rewards (Kober et al., 2010)—makes participants more likely to cheat in cooperative interactions (Knoch et al., 2009; Knoch & Fehr, 2007; Ruff et al., 2013; Soutschek et al., 2015; Strang et al., 2015). Following 1,000 children from birth to age 32, Moffitt et al. (2011) show that children with poor self-control are more likely to be convicted of a criminal offense as adults, after controlling for social class origins and IQ. Meta-analytic evidence confirms that low self-control is associated with criminal behaviors (Vazsonyi et al., 2017), lower propensity to forgive others and refrain from retaliation (Burnette et al., 2014; Liu & Li, 2020), and poorer interpersonal functioning (e.g., loyalty) (de Ridder et al., 2012). Low self-control predicts greater propensity to deceive others to obtain more benefits (Fan et al., 2020), lower likelihood to keep promises in relationships (Petz & Kamrath, 2011), as well as uncooperative behaviors in the workplace (e.g., low accommodation of coworkers’ needs) (Cohen et al., 2014; Restubog et al., 2010). Regarding sexual cheating, low conscientiousness—a construct related to self-control (Duckworth & Seligman, 2017)—predicts greater likelihood of infidelity in men and women across 52 countries of 10 world regions

(Schmitt, 2004; see also Pronk et al., 2011). And studies suggest that intensity of sexual desire, as well as tendencies to notice attractive alternative partners, predict greater infidelity among people with low, but not high dispositional self-control (Brady et al., 2020; McIntyre et al., 2015).

Despite this wealth of evidence, the self-control-requirement of cooperation has been questioned by results from economic games, where meta-analytic evidence finds no association between self-control and cooperation (Thielmann et al., 2020). Studies also found that American participants cooperate more when forced to decide quickly than when forced to delay their decision—suggesting that cooperation in economic games, rather than requiring self-control, may be spontaneous and effortless (Rand, 2016, 2017; Rand et al., 2012). However, this “intuitive cooperation” effect failed to replicate in several, highly powered replications (Bouwmeester et al., 2017; Camerer et al., 2018; Fromell et al., 2020; Isler et al., 2021). Recent evidence indicates that, while cooperating in economic games may be prosocial individuals’ spontaneous impulse, the reverse is true for more selfish individuals, in which deliberation *increases* cooperation—consistent with a role of self-control (Alós-Ferrer & Garagnani, 2020; Andrighetto et al., 2020; Nockur & Pfattheicher, 2021; Yamagishi et al., 2017). As Thielmann et al. (2021) note, this moderation by prosocial disposition may have obscured the relationship between self-control and cooperation in their meta-analysis of economic games (pp. 62-63). Field experiments also suggest that economic games underestimate the involvement of self-control in real-life cooperative decisions. Studying Brazilian fishermen living from their catch from a common lake, Fehr & Leibbrandt (2011) found that, while impulsivity was not associated lower cooperation in an economic game, it did predict likelihood to free-ride on the common-pool resource in real life.

### ***3.1.3. People perceive that cooperation requires self-control***

Our account of puritanism assumes that people intuitively perceive this self-control-requirement of cooperation—a premise that is well supported. Lie-Panis & André (2022) show that, because ability to delay gratification enables higher levels of cooperation, it can evolve into a credible signal of trustworthiness. Psychological evidence confirms that, in interaction with strangers as well as in established relationships, people infer others’ self-control from their behavior, and expect individuals they perceive as more self-controlled to behave more cooperatively (Buyukcan-Tetik et al., 2015; Buyukcan-Tetik & Pronk, 2021; Gai & Bhattacharjee, 2022; Gomillion et al., 2014; Koval et al., 2015; Peetz & Kammrath, 2013, 2013; Righetti &

Finkenauer, 2011). People’s intuitions about a good moral character include traits arguably related to self-control, such as being principled or responsible (Goodwin et al., 2013; Goodwin, 2015). And many societies consider self-control, self-discipline, or self-restraint, as key virtues inherent to a good moral character (e.g., Lybian Bedouins: Abu-Lughod, 2016, pp. 90–93; Buddhism: Clark, 1932, pp. 86–88; Goodman, 2017; Confucianism: Csikszentmihalyi, 2020; Tiwald, 2020; Sunni Islam: el-Aswad, 2014; Wolof: Irvine, 1974, pp. 126–127; Zanzibar: Beckmann, 2010, p. 620; Christianity: Spiegel, 2020).

### **3.2. People perceive that some behaviors alter self-control**

People, thus, intuit that cooperation requires self-control. We argue that puritanical moral judgements emerge from the interaction of this intuition with folk-psychological beliefs that some behaviors *alter* self-control. These behaviors include consuming intoxicants (e.g., alcohol, drugs), exposing oneself to tempting environments (e.g., immodest clothes, unruly music and dances), overindulging in potentially addictive pleasures (e.g., food, sex, intoxicants), or pursuing undisciplined lifestyles (e.g., intemperance, idleness, lack of ritual observance). The moral disciplining theory posits that these behaviors are moralized when perceived as undermining people’s ability to control their impulses, to the point of endangering compliance with their cooperative obligations. This section characterizes the folk-psychological beliefs which, we propose, underly puritanical moral judgements.

#### ***3.2.1. Lay theories of modifiers of state-self-control***

Some behaviors of the puritanical constellation, we argue, are perceived as altering self-control as a state—that is, the ability to resist temptation in a given moment. We call them “modifiers of state-self-control”.

***Intoxicants.*** A first perceived modifier of state-self-control is intoxicant use. Psychological evidence shows that people widely believe alcohol to cause loss of self-control (Brett et al., 2016; Critchlow, 1986; Leigh, 1987). Studies similarly suggest that people perceive drug use as enhancing short-term impulses (Quintelier et al., 2013). These lay theories likely stem from observation of intoxicants’ objective psychological effects. Alcohol actually impairs the inhibition of impulses (Heatherton & Wagner, 2011), narrows attention to cues of immediate rewards—an effect known as “alcohol myopia” (Giancola et al., 2010)—, and fuels a range of impulsive behaviors (e.g., reactive aggression: Duke et al., 2018; Gan et al., 2015; Parrott & Eckhardt, 2018;

sexual impulsivity: Rehm et al., 2012; economic impulsivity: Schilbach, 2019). Consumption of drugs is similarly associated with impulsivity (Duke et al., 2018; Nemoto et al., 2007; Weafer et al., 2014).

The moral disciplining theory thus posits that intoxicants are moralized because they are perceived as favoring uncooperative behaviors, such as aggression, infidelity, and general negligence of obligations, by leading people to lose control over immediate impulses, and fueling disregard of future consequences. This hypothesis contrasts with existing accounts, which ignore cooperative concerns in the moralization of intoxicants, by arguing that their moralization stems from disgust-based concerns for the “purity of the soul” (Clifford et al., 2015; Henderson & Dressler, 2019; Horberg et al., 2009; Silver, 2020), or from exclusively selfish attempts of monogamous strategists to limit sexual promiscuity specifically (Kurzban et al., 2010).

***Immodesty as cue exposure.*** Beside intoxicants, people perceive that self-control is also threatened by exposure to stimuli triggering short-term-oriented impulses—an effect called cue-exposure (Heatherton & Wagner, 2011). Animal brains evolved reward systems tracking stimuli contributing to reproductive success (e.g., food items, sexual opportunities). Environmental cues predicting such items’ availability in the immediate environment (e.g., sexual cues, appetizing smell) are thus rapidly learned and imbued with “wanting” properties (Duckworth, Gendler, et al., 2016; Hyman, 2007; Kringelbach & Berridge, 2009). Exposure to these cues thus generates strong urges to consume the reward in the here and now, pushing individuals toward immediate gratification at the expense of long-term goals (Boswell & Kober, 2016; Demos et al., 2012; Fujita, 2011; Heatherton & Wagner, 2011).

People have a folk-understanding of cue-exposure. Early in development, children understand that distracting their attention away from tempting cues (e.g., the marshmallow in front of them) allow them to delay gratification more easily (Carlson & Beck, 2001; Mischel & Mischel, 1983; Peake et al., 2002; Sethi et al., 2000). Also witnessing this folk-understanding, people develop “situational” strategies for self-control, rearranging their environment upstream (e.g., by not storing tempting snacks at home) to prevent short-term impulses to be triggered by cue-exposure (Duckworth, Gendler, et al., 2016; Duckworth, White, et al., 2016; Milyavskaya et al., 2020). This folk-understanding, we argue, has moral consequences when cue-exposure is perceived as endangering, not *personal* self-control (e.g., resisting sugar to preserve health), but *moral* self-control (resisting impulses to refrain from cheating).

This allows explaining another part of the puritanical constellation—the condemnation of immodesty. Behaviors condemned as immodest by puritanical standards typically involve emission of stimuli likely perceived as triggering impulses, thus favoring harmful self-control failures. Immodest clothing reveals cues of female fertility or sexual interest, such as body curves, skin, hair, or eyes (Pazhoohi, 2016; Pazhoohi & Hosseinchari, 2014). Exposure to these cues is known to alter males’ state-self-control, by triggering their reward systems and sexual appetite (Platek & Singh, 2010; Spicer & Platek, 2010; Symons, 1995), and increasing their preference for immediate over delayed rewards (Kim & Zauberman, 2013; Wilson & Daly, 2004). Studies also suggest that exposure to sexual cues increases males’ propensity to engage in manipulative and coercive behaviors to obtain sexual gratification—and thus to facilitate, not only self-control failures in general, but also *moral* self-control failures (Ariely & Loewenstein, 2006).

Prescriptions of modesty, we thus argue, are another strategy—besides prohibition of intoxicants—for preventing self-control failures with socially harmful effects. Immodest clothing and behaviors are moralized because, by increasing cue exposure, they are seen as increasing the probability that people—especially males—lose control over impulses, thereby favoring antisocial behaviors such as sexual aggression, conflicts, adultery, or premarital sex<sup>3</sup>. Just as people remove tempting snacks from their environment when feeling unable to resist them, societies can deem mutually beneficial, when fearing the fragility of their members’ self-control (see Section 5), to remove tempting stimuli from their environment to prevent uncooperative behaviors.

This hypothesis contrasts with existing accounts of modesty norms, which mainly regard them as selfish attempts of males to guard their mates (Dickemann, 1981; Pazhoohi et al., 2017). While

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<sup>3</sup> Premarital sex also amounts to cheating other people in some social contexts. In many societies, marriage is not only a cooperative interaction between spouses, but also a way to forge social exchange relationships between families (Coontz, 2006; Schlegel, 1991). In this context, young people’s premarital sex incurs important costs to families, for example by decreasing daughters’ “value” on the matrimonial market (Beckmann, 2010, p. 623; Dickemann, 1981; LeVine, 1959, pp. 978–979), or leading to costly pregnancies out of wedlock or unwanted marriages (Broude, 1996; Dabhoiwala, 2012b, pp. 29–30; Goody, 1976, p. 17). As a result, everyone may benefit if everyone limits premarital promiscuity, which, as a threat to the public good, is collectively condemned and brings a bad moral reputation to “fornicators” and their relatives (Beckmann, 2010, pp. 622–623; Dabhoiwala, 2012b, p. 618).

males' mate-guarding interests likely contribute to these norms' attractiveness, we propose that moralization of modesty also emerge from more widely shared concern for the general social harm (e.g., conflicts, aggressions, infidelity) that may result from failures to control sexual impulses.

### ***3.2.2. Lay theories of modifiers of trait-self-control***

Other behaviors of the puritanical constellation, we argue, are perceived as altering self-control as a trait—that is, as the stable psychological disposition to resist temptations across situations. We term them “modifiers of trait-self-control.”

***Immoderate indulgence in bodily pleasures.*** Moralizations of victimless bodily pleasures, we argue, stem from perceptions that excessively or too frequently indulging in bodily pleasures would decrease trait-self-control. Such beliefs may be grounded in experience: the bodily pleasures typically condemned by puritanical standards generate common addictions, such as food addictions (Volkow et al., 2011, 2017), sexual addictions (Farré et al., 2015; Karila et al., 2014), alcohol addiction (Vengeliene et al., 2008), drug addiction (Baler & Volkow, 2007), or gambling disorder (Farré et al., 2015)—addiction being widely viewed as a disruption of self-control (Baler & Volkow, 2007; Vonasch et al., 2017). Researchers have long noted the potent reinforcement learning associated with consumption of bodily pleasures or intoxicants: past experience with such a reward (e.g., energy-rich food) increases the motivational drive (“wanting”) elicited by future exposure to it, making harder the future self-control of the associated impulse (e.g., food craving; Baler & Volkow, 2007; Story et al., 2014; Volkow et al., 2017).

Accordingly, a widespread belief seems to be that the more one indulges in bodily pleasures, the more their temptations become hard to resist. A significant share of people believes that pornography (Grubbs et al., 2018; Grubbs et al., 2019), fatty and sugary foods (Ruddock & Hardman, 2017), and intoxicants (Edelstein et al., 2020; El Khoury et al., 2019) can be addictive, while experimental evidence suggests that people intuitively associate addiction with loss of self-control (see Vonasch et al., 2017). In vignette studies, we found that participants judged individuals increasing their indulgence in bodily pleasures over several months (e.g., pornography, alcohol, fatty and sugary foods) as altering their trait-self-control as a result of this lifestyle change (Fitouchi, André, Baumard & Nettle, 2022). Surveying religious attitudes toward

pleasure, Glucklich (2020, pp. 13–27) concludes that the addictive character of food, sex, alcohol, or gambling, is a major concern across world religions. Reviewing attitudes toward sex in European history, Dabhoiwala (2012) highlights that “It was a Christian commonplace that anyone who succumbed to this impure appetite [lust], even just once, risked developing a fatal addiction to it” (p. 33). In Hinduism, similarly, “Ancient Indian texts often call the four major addictions that kings were vulnerable to ‘the vices of lust’, sometimes naming them after the activities themselves—gambling, drinking, fornicating, hunting” (Doniger, 2014, p. 365). Table 1 summarizes selected cases of such folk-psychological beliefs in various cultural contexts.

**Table 1. Examples of folk psychological beliefs about modifiers of trait-self-control**

<b>Folk-psychological beliefs</b>	<b>Selected societies and traditions (with references)</b>
<p><b>Behaviors corrupting dispositional self-control:</b> Excessive indulgence in bodily pleasures (e.g. sex, food, drinking) reinforces short-term cravings, leading to hard-to-control habits and addictions</p>	<p>Amhara, Ethiopia (Levine, 1965, p. 223) Early, Medieval and early modern Christianity (Dabhoiwala, 2012, p. 33; Spiegel, 2020) Chinese Warring States period (Nylan, 2001) France, 19<sup>th</sup> century (Guerrand, 1984, p. 302) Greco-Roman Antiquity, ascetic wisdoms (e.g. Stoicism, Platonism, Pythagoreanism) (Gaca, 2003; Irvine, 2009, pp. 114–115) Nordic and English-speaking “temperance cultures” (19<sup>th</sup> c.) (Levine, 1993; Yeomans, 2011) North India (Vatuk &amp; Vatuk, 1967) Hinduism and Ancient India (Doniger, 2014, pp. 363–371) Contemporary conservative Protestantism (Sherkat &amp; Ellison, 1997) Victorian England, 19<sup>th</sup> c. (Seidman, 1990, p. 50) Zanzibar (Beckmann, 2010, p. 622)</p>
<p><b>Behaviors improving dispositional self-control:</b> self-control can be trained by sustained self-discipline, ascetic practices or disciplinary rituals (e.g., fasting, effortful or painful treatments, spiritual disciplines).</p>	<p>Amhara (Reminick, 1975, p. 123) Christian tradition (Spiegel, 2020a) Chinese Confucian tradition (Csikszentmihalyi, 2009, 2020) Greco-Roman ascetic spiritualities (Gaca, 2003) Islamic tradition (el-Aswad, 2014; Garden, 2014; Rehman, 2019; Schielke, 2009) Japanese Buddhism (Mann, 2011) Hinduism (Doniger, 2014) Orissa, India (Menon, 2013) Ona (Gusinde, 1931, p. 1470) Tlingit (Kan, 1989, pp. 54-55, 59–60) Ojibwa (Hallowell, 1976, pp. 96, 205, 418) Tukano (Hugh-Jones, 1979, pp. 147, 271) Enga (Wiessner &amp; Tumu, 1998, p. 218)</p>

If people perceive that cooperation requires self-control (section 3.1.3.), and that overindulgence in bodily pleasures reduces self-control, they may moralize bodily pleasures as indirectly facilitating uncooperative behaviors. For example, if indulgence in sexual pleasure *in victimless*

*situations* (e.g., masturbation, frequent sex within marriage), is perceived as making people addict to sex, it becomes responsible for impeding the control of sexual urges in *cooperative situations* as well, where these impulses *are* socially harmful (e.g., when resisting them is necessary to avoid adultery). If victimless gluttony is perceived as making people addict to food, it becomes responsible for fueling uncontrollable urges which, in other situations, will prove socially harmful (e.g., when resisting food cravings is necessary to respect others' property). Repeated indulgence in bodily pleasures may be perceived, more generally, as decreasing self-control across domains, thus decreasing people's cooperativeness in general. This would be consistent with the lay theory we discuss next: that repeatedly practicing self-control would train self-control.

***Self-control training, daily self-discipline, and ritual observance.*** Another recurrent lay theory seems to be that self-control can be trained by repeated practice—although the objective efficacy of such training is scientifically debated (Berkman, 2016; Friese et al., 2017; Miles et al., 2016). Field experiments on parents suggest a widespread belief that children's self-control can be improved, associated with self-control-training practices, such as giving children unhealthy snacks less often, or bringing them less frequently to fast-food restaurants (Mukhopadhyay & Yeung, 2010). In vignette studies, participants judged that sustained self-discipline over several months (e.g., exercising regularly, reducing indulgence in bodily pleasures) would likely improve a target's trait-self-control (Fitouchi et al., 2022). This is consistent with cross-culturally recurrent beliefs that investment in ascetic practices or effortful activities allow to “build character” and improve people's self-control (see Table 1).

If people perceive both that cooperation requires self-control (Righetti & Finkenauer, 2011), and that regular self-discipline trains self-control, they may moralize effortful activities (e.g., waking up early, spiritual disciplines, needless hard-work), as means to “build character”—i.e., to improve the self-control required to honor prosocial obligations. This helps explaining another component of the puritanical constellation: the moralization of constant self-discipline, needless hard work, and unproductive effort, even when the latter are devoid of direct benefits to other people (Celniker et al., 2022; Tierney et al., 2021).

This also allows explaining the moralization of pious ritual observance. Indeed, psychologists have extensively argued that rituals of world religions, such as fasting, meditation, regular prayer, or effortful pilgrimages, appear specifically geared toward training self-control (Koole et al., 2017; McCullough & Carter, 2013; McCullough & Willoughby, 2009; Tian et al., 2018; Wood,



2017; Geyer & Baumeister, 2005). These rituals require sustained restrictions of bodily desires (e.g., fasting), commitment to regular practice (e.g., praying five times a day, at fixed hours), cognitive effort (e.g., reading and memorizing the scriptures), and repeated inhibition of spontaneous tendencies (McCullough & Willoughby, 2009). We argue that these activities, as the rest of the puritanical constellation, are ascribed a moral disciplining function: cultivating the self-control perceived necessary to honor prosocial obligations. This allows explaining why moralizations of diligent ritual observance cluster with other puritanical values (section 1.1.)—so that “piety” is commonly listed, alongside temperance and restraint from bodily pleasures, among the core virtues of the “purity” morality (Graham et al., 2013; Haidt, 2012; Haidt & Joseph, 2007).

### **3.3. Puritanism and the moral mind**

Our last assumptions concern the cognitive mechanisms of moral judgement. First, our account rests on a unitary model to moral cognition, according to which moral judgements—including puritanical ones—are produced by a single, functionally unified cognitive system sensitive to cooperation. In line with other unitary theories of moral cognition (Gray et al., 2012, 2014; Schein & Gray, 2015, 2018), we insist that the plurality of moral values at the cultural level does not imply the existence of a plurality of moral systems at the cognitive level. The same moral system can produce, based on the very same computational procedures, a wide variety of outputs, and thus culturally variable values, depending on the varying inputs that it receives (Aarøe & Petersen, 2014; Nettle & Saxe, 2020, 2021). In the case of puritanical norms, a domain-general system sensitive to harm (Gray et al., 2014), or fairness (Baumard et al., 2013), can moralize victimless behaviors, as long as it is fed by causal representations depicting those behaviors as indirectly leading to socially harmful outcomes.

Second, we assume that this moral system is triggered not only by intrinsic instances of uncooperative behaviors (e.g., violence, adultery, unfair sharing), but also by behaviors perceived as indirectly and probabilistically leading to social harm. This is consistent with experimental evidence that the triggering of moral judgement depends on the computation of a—potentially indirect—causal chain between a perpetrator’s action and an undeserved cost imposed on another individual (Cushman, 2008; Guglielmo & Malle, 2017; Sloman et al., 2009). Victimless excesses should be preemptively moralized when perceived to causally contribute, through their deleterious effects on self-control, to an increased prevalence of uncooperative behaviors.

Restrained behaviors should be praised when perceived to positively contribute, through their preserving effects on self-control, to the improvement of people's cooperativeness.

### **3.4. The cultural evolution of puritanism as a behavioral technology**

So far, we have focused on the psychological level of moral judgement. Yet puritanism also manifests in socially transmitted traits, subject to cultural elaboration. Carnal sins are not only judged in everyday life; they have been systematized in explicit religious classifications (e.g., the Seven deadly sins; Hill, 2011; Tentler, 2015). Ascetic rituals of fasting, meditation, or regular prayer have been crafted and institutionalized by doctrinal religions (Brown, 2012; Tentler, 2015). Legal regulations of alcohol have been gradually elaborated and negotiated in cultural groups (Martin, 2009; Matthee, 2014). Thus, the emergence of puritanical norms is also fruitfully conceived in cultural evolutionary terms. These puritanical cultural traits, we argue, have evolved as people, based on their folk-psychological theories of self-control, have attempted to facilitate self-control to ensure cooperative behavior.

Prominent cultural evolutionary theories argue that normative cultural traits, such as monogamous marriage (Henrich et al., 2012), moralizing religions (Norenzayan et al., 2016), or large-scale cooperative institutions (Richerson et al., 2016), spread in human populations because they procure *objective adaptive benefits* by increasing cooperation. While human enforcement mechanisms (e.g., reputation, punishment) can stabilize any norm (Aumann & Shapley, 1994; Boyd & Richerson, 1992), inter-group competition would favor cooperation-facilitating norms at the expense of other evolutionarily stable equilibria (Henrich & Muthukrishna, 2021). Thus, one possibility is that puritanical norms emerge through random variation, as one of the many stable equilibria that enforcement mechanisms can maintain, and are then favored by cultural group selection. In this perspective, puritanical norms should be objectively effective in increasing cooperation by facilitating self-control (see McCullough & Carter, 2013), and would be favored by impersonal selective pressures that are independent of people's understanding of the mechanisms these norms involve or the function they serve (see Henrich, 2017, 2020)

Another possibility, however, is that the cultural evolution of norms is driven by people's *subjective perceptions* that some norms are efficient in satisfying their goals, leading them to selectively retain these norms at the expense of others (Singh, 2022; Singh et al., 2017). This "subjective selection" approach stresses that providing objective benefits to individuals or groups is not necessary for many cultural traits to evolve (Singh, 2022). People use their

intuitions and folk-theories to craft cultural traits. Sometimes, these intuitions accurately perceive objective benefits, leading people to retain adaptive technologies, such as efficient tools or weapons (Osiurak & Reynaud, 2019). Other times, people’s psychological biases and folk-theories are simply erroneous, leading them to retain ineffective practices—such as divination (Hong & Henrich, 2021), dark magic (Singh, 2021), bloodletting (Miton et al., 2015), shamanism (Singh, 2018), or rain-making rituals (Hong et al., 2022). Such technologies recurrently evolve in human societies despite providing no adaptive benefits, simply because people wrongly perceive them as beneficial.

Normative culture, we argue, is no different. Just as people use their technical reasoning to craft technical artifacts, they use their *folk-psychology* to design “behavioral” technologies (e.g., norms, religions, institutions) aimed at influencing other individuals’ behaviors. For example, Ostrom (1990) famously reviewed how people in many small-scale communities deliberately developed, often through years of trial-and-error, institutional rules they perceived as efficient in limiting free-riding. Researchers similarly argue that beliefs in punitive gods develop because people’s folk-psychology perceives these beliefs—potentially wrongly—as likely to motivate others to cooperate (Fitouchi & Singh, 2022).

We argue that puritanical norms, from disciplinary rituals to Victorian anti-masturbation campaigns (Seidman, 1990), emerge from similar processes. They culturally evolve as people, based on their folk-theories of self-control, attempt to manipulate the psychological mechanics of temptation and self-control to promote prosocial behavior (Fitouchi et al., 2021c). This drives the cultural evolution of norms aimed at training self-control (e.g., techniques of self-discipline, prohibitions of alcohol) or nudging resistance to temptations (e.g., modest clothing), to favor social harmony and mutually beneficial interactions. Just as for other technologies, these norms may or may not be objectively effective in promoting self-control and thus cooperation—what matters is that people *perceive* that they are. In fact, there is only mixed evidence that self-control-training (Friese et al., 2017; Miles et al., 2016) and religious observance (Marcus & McCullough, 2020) can actually make people more self-controlled. Of course, this doesn’t imply that puritanical norms never work. Econometric analyses suggest that some moral crusades against alcohol (19<sup>th</sup> and 20<sup>th</sup> c.) have successfully reduced drunkenness-driven violent crimes (Lowe, 2020). Field experiments in Iran suggest that conservative religious clothing actually decreases chances of male-female encounter (Pazhoohi & Burriss, 2016). In our model, however, these

objective benefits will affect cultural evolutionary dynamics only if they are reflected in people's subjective perceptions of efficacy, thus impacting people's adoption and promotion strategies.

## 4. Explaining the core features of puritanism

This section derives predictions from the Moral Disciplining Theory (MDT), contrast them with those of alternative accounts, reviews current evidence supporting them, and outlines avenues for further testing. MDT generates predictions for the moralizations of each behavior of the “puritanical constellation”, which can be tested independently—on bodily pleasures and lack of self-discipline (4.1.), intoxicants (4.2.), piety and ritual observance (4.3.), and immodest clothing, music and dances (4.4.).

Several predictions apply to each behavior of the constellation. For each behavior, MDT predicts that (a) its moralization should be most robustly associated with the perception that it affects cooperation (e.g., cause social harm); (b) the more people perceive the behavior as affecting self-control, the more they should moralize it; and (c) the perception that the behavior affects self-control should mediate the perception that it affects cooperation. Reliably disconfirming these predictions for a given behavior would result in falsification of MDT's hypothesis for the moralization of this behavior. Predictions that are more specific to one particular behavior (e.g., immodesty) are further specified in the dedicated subsection (e.g., 4.4.).

### 4.1. The praise of temperance and the condemnation of bodily pleasures

#### *4.1.1. Moralizations of bodily pleasures should be most robustly associated with perceptions that they facilitate social harm*

As a cooperation-based theory of puritanism, MDT predicts that moralizations of victimless bodily pleasures, and lack of self-discipline, should be most robustly associated with the perception that they facilitate uncooperative behaviors and cause social harm. In line with this idea, Schein et al. (2016) show that moralizations of sexual indulgences (e.g., oral sex) are most strongly associated with perceptions that these behaviors are “dangerous” or “harmful.”

Associations between disgust (or disgust-sensitivity) and moralizations of sexual indulgences disappear when perceptions of harm are controlled for (Schein et al., 2016; see also Gray et al., 2014; Gray & Schein, 2016). In the General Social Survey, support for legal restrictions of

pornography is associated with the belief that “sexual material lead people to commit rape” (Sherkat & Ellison, 1997). In two vignette studies ( $N > 1,100$ ), we presented participants with a target led to increase their indulgence in bodily pleasures, such as gluttony and masturbation (Fitouchi, André, Baumard & Nettle, 2022). Participants judged that, as a result of this lifestyle change, the target had likely become more prone to uncooperative behaviors, such as refusing to help a friend, free-riding on colleagues’ work, and cheating his partner if he had the chance (Fitouchi, et al., 2022). The more participants perceived that bodily pleasures would decrease the target’s cooperativeness, the more they morally condemned victimless indulgence in those pleasures (Fitouchi et al., 2022).

At a more general level, MDT predicts that moralizations of victimless excesses should relate to cooperation-based moral concerns. By contrast, Moral Foundations Theory (MFT) argues that moralizations of self-discipline are part of disgust-based concerns unrelated to cooperation. Thus, as per Moral Foundations Theory, condemnations of victimless excesses should relate more strongly to “purity” concerns—putatively independent of cooperation—than to other moral concerns unambiguously related to cooperation (e.g., loyalty). Across four studies using the Moral Foundations Questionnaire ( $N > 3000$ ), participants’ tendency to moralize victimless excesses (e.g., snacking on junk food, getting high on drugs, failing to exercise) is predicted not only by concerns for “purity”—which MFT assumes to be independent of cooperation—, but also, and to a similar extent, by moral concerns uncontroversially related to cooperation, such as Loyalty/Betrayal, and Authority/Respect (Mooijman et al. 2018). This suggests that self-discipline is moralized because it is seen as necessary to ensure within-group cooperation and social order.

These findings are consistent with historical evidence. Historians and social scientists have argued that puritanical moral campaigns of Early Modern Europe—variously labelled “disciplinary revolutions” (Gorski, 1993, 2003), “social disciplining” (Oestreich, 1982), “civilizing offensives” (Eisner, 2014; Powell, 2013), or “reform of popular culture” (Burke, 1978)—condemned undisciplined indulgence in bodily pleasures to “foster forms of socialization that would promote cooperation and harmony and result in a well-disciplined and well-ordered society” (Martin, 2009, p. 9; Burke, 1978; Eisner, 2014; McIntosh, 2002). Similarly, ancient ascetic spiritualities (e.g., Late Stoicism, Platonism, early Christianity, Pythagoreanism), prescribed an “overall habituation to temperance” with the explicit aim to prevent bodily appetites to fuel antisocial behaviors (Gaca, 2003). As Platonism contended, for example,

sexual eros and the other two core appetites [eating and drinking], unless held in check by reason, are the origin of human-motivated social ills because they stimulate all vices from avarice to zealotry. If only we minded the necessary limits of sexual activity and ate and drank moderately, the society of peace and justice would be ours for the taking (Gaca, 2003, pp. 35–36).

#### ***4.1.2. The more people perceive bodily pleasures as altering self-control, the more they should moralize bodily pleasures***

MDT posits that people perceive bodily pleasures as degrading cooperativeness *because* they perceive bodily pleasures as degrading self-control, for example because of their addictive character. Thus, the more people perceive victimless bodily pleasures as addictive, or as altering self-control more generally, the more they should moralize bodily pleasures. In line with this idea, studies consistently find that the moralization of pornography is associated with the perception that it is addictive for the self (Grubbs et al., 2015; Grubbs et al., 2018; Grubbs, Wilt, et al., 2018). The perception that pornography is addictive is also more prevalent among religious people (Droubay & Butters, 2020), who are known to moralize pornography more strongly (Droubay et al., 2021; Grubbs et al., 2015). In vignette studies, the more participants perceive indulgence in gluttony, masturbation, and harmless laziness, as reducing an individual's self-control, the more they morally condemn victimless indulgence in those pleasures (Fitouchi et al., 2022).

#### ***4.1.3. The perception that bodily pleasures alter self-control should mediate the perception that they affect cooperation***

Experimental evidence suggests that the perceived effect of bodily pleasures on self-control mediates their perceived effect on cooperativeness. In the above-mentioned studies, the effect of indulgence (vs. restraint) on a target's perceived change in cooperativeness was 100% mediated by the perceived deleterious effect of indulgence (vs. restraint) on the target's self-control (Fitouchi et al., 2022). In other words, participants perceived indulgence in bodily pleasures, as opposed to restraint, as increasing an individual's propensity to uncooperative behaviors almost exactly to the extent that they perceived indulgence (vs. restraint) as altering this individual's self-control.

This converges with experimental evidence on the moralization of gluttony. People regularly indulging in fatty and sugary foods (e.g., hamburgers, donuts), compared to people with healthy diets, are seen not only as less moral and less trustworthy (Mankar et al., 2008; Merritt, 2013; Oakes et al., 2004; Steim & Nemeroff, 1995), but also as less self-controlled (Gerrits et al., 2009; Merritt, 2013; Puhl & Heuer, 2010; Steim & Nemeroff, 1995). Experimental evidence indicates that these perceptions of lower self-control mediate the relationship between indulgent (vs. restrained) diet and perceived lower morality and trustworthiness (Fitouchi et al., 2022; Merritt, 2013; Steim & Nemeroff, 1995)—more so than other mediators such as a health-related concerns or a general halo effect (Steim & Nemeroff, 1995).

These results converge with historical and ethnographic evidence that, in various cultural contexts, overindulgence in food or sex is condemned as causing uncooperative behaviors *through* the erosion of self-control. Scholars have argued that moral panics over masturbation in Victorian England emerged from the fear that excessive sexual activity “could, and probably would, lead to habits of indulgence in sensual pleasure and thus cause the erosion of self-control” (Hunt, 1998, p. 589; Seidman, 1990). Masturbation, or too frequent marital sexuality, were denounced as

a vice which excites...the strongest and most uncontrollable propensities of animal nature [i.e., sexual impulses]: these are rendered more active by indulgence, while the power of restraint is lessened by it in a tenfold degree...Controlled by sensual urges *the individual loses self-control and social purpose. This inevitably leads to self-destruction and to social chaos and decline* (Seidman, 1990, pp. 50-52, emphases added).

In Muslim Zanzibar, “once tried out, sex is said to dominate a person’s thoughts with ever-increasing desire and to make it difficult to refrain from behavior that is classified as immoral, including disrespect of the elders or drug and alcohol abuse” (Beckmann, 2010, p. 622). In North India, excessive indulgence in sweets is perceived to develop an impulsive character trait, leading to commit antisocial behaviors, “like cheating, stealing and selling daughter” (Vatuk & Vatuk, 1967, p. 111). As ethnographers report:

The problem of the *chatora* [the sweet addict] in Indian society seems to be perceived by our informants as *a problem of loss of control over the senses* by the sweet addict...*Excessive indulgence in sweets has made the chatora incapable of resisting the temptations which continually beset a man from all directions...* The weakness of the *chatora* is inexcusable...because it is evidence of his potential *weakness against all the temptations of anti-social behavior.* (Vatuk & Vatuk, 1967, pp. 111-112, emphases added).

In the Amhara peasants (Ethiopia), “there is also the fear that if one indulges in eating and drinking he may become uncontrollably hostile” (Levine, 1965, p. 223), because “eating and drinking to full satiation, and maintaining this state over time, makes one thankless, arrogant, unmindful of law and custom, and dangerously impulsive” (Reminick, 1975, p. 29). Surveys of moral attitudes toward food since European Antiquity conclude that “[t]he heart of the problem it seems is that food pleasure challenges self-control” (Coveney, 2006, p. xii; Hill, 2011). In medieval Christianity, excessive food pleasure—alongside other deadly sins—“represent devilish temptations that challenge the Christian to develop and practice discretion and self-control” (Hill, 2011, p. 135). By weakening the will, gluttony “turns humans into dishonest animals, destined for hell” (Hill, 2007, p. 68). By seeking “delicious viands,” a man can “do good to fewer others and cannot withhold himself so that he may help a poor man, or two, or more” (Hill, 2007, p. 68). As Doniger (2014) highlights, similar rationales for abstaining from meat recur in Hindu texts: “flesh heats the passions and is, therefore, dangerous for the ideal Hindu person, who is always in control of his emotions.” (p. 415).

#### **4.2. The praise of sobriety and the moralization of intoxicants**

According to existing theories, intoxicants are moralized because they elicit disgust (Horberg et al., 2009), or because they favor sexual promiscuity, thereby infringing on the self-interest on monogamous individuals (Kurzban et al., 2010). By contrast, MDT predicts that:

- (i) the moralization of intoxicants should be most robustly related to the perception that they cause uncooperative behaviors in general—including in the sexual domain (e.g., infidelity), but not exclusively;
- (ii) because they threaten not just monogamous individuals’ self-interest, but mutually beneficial cooperation more generally (e.g., social harmony), intoxicants should be moralized not only by monogamous strategists, but also by other individuals;
- (iii) the moralizations of intoxicants should be associated with the perception that they decrease self-control, either as a state, due to their immediate psychoactive effects (section 3.2.1.), or as a trait, due to their addictive nature (section 3.2.2.);
- (iv) the perception that intoxicants decrease self-control should mediate the perceived relationship between intoxicant use and uncooperative behaviors.

Future studies could test these predictions. Several lines of evidence, in the meantime, suggest their plausibility.



First, survey data show that people across countries believe that intoxicants and aggression are causally linked (Critchlow, 1986; Leigh, 1987; Lindman & Lang, 1994; Paglia & Room, 1998). In the 1996 General Social Survey, 70.9% of respondents view people addicted to alcohol as likely to do something violent to others, while this proportion reaches 87.3% for people addicted to drugs (Pescosolido et al., 1999)—a pattern found in various studies and countries (Yang et al., 2017). In a representative sample of the UK population, “fear of violence,” and perceptions that they have a “bad character”—a notion related to trustworthiness (Goodwin, 2015)—are the best predictors of stigmatizing attitudes toward heroin-addicts, explaining respectively 23.5% and 12.4% of the variance (Mushtaq et al., 2015). By contrast, perceived risk of contagion—relevant to the disgust-hypothesis—explained only 0.9% of the variance (Mushtaq et al., 2015). In a sample of 1512 Uruguayan adults, the strongest predictor of opposition to the government’s recent decision to legalize marijuana is the belief that this law will worsen public security (Cruz et al., 2018).

This converges with historical and ethnographic evidence that moral concerns over drinking revolve around the uncooperative behaviors it facilitates, such as adultery, conflicts, economic free-riding, or poor performance of family roles (Eisner, 2014; Martin, 2002, 2009; McIntosh, 2002; Room, 1984; Room, 1996). In a systematic study of more than 200 English and French primary sources (e.g., sermons) from 1300 to 1700, Warner (1997) shows that drinking was condemned as causing six main types of social harm, including domestic violence, public violence, disrespect of authorities, and resources loss (placing economic burdens on the community). Legal regulations of drinking in traditional Europe (13<sup>th</sup>-18<sup>th</sup> c.) are declared necessary because alcohol is “the root and foundation of many other enormous sins, such as bloodshed, stabbing, murder, swearing, fornication [*sic*], adultery, and such like” (Martin, 2009, p. 2), and results in “idleness, blasphemy, homicides and other damage and harm” (Martin, 2009, p. 30). Analyses of articles on marijuana published in American popular magazines between 1935 and 1940—a period of moral concern over drug use—similarly find that 85% mentioned violence as one of its effects (Himmelstein, 1983).

Second, intoxicants appear perceived as causing uncooperative behaviors *because* of their effects on self-control. In survey responses, beliefs that alcohol causes “loss of self-control” and “disinhibition” is associated with the belief that alcohol favors “nasty” behaviors (e.g., fights, aggression) ( $r = 0.54$ ) (Leigh, 1987). Presenting participants with 15 vignettes of a dating

situation, Shively (2001) asked participants to rate a man's level of self-control and likelihood of sexual aggression. As the man was described as more inebriated, participants perceived him as less self-controlled and less able to stop himself from sexual aggression. In other studies, participants judged that a target led to increase his consumption of alcohol would become less self-controlled, more likely to commit uncooperative behaviors, and would worsen his moral character as a result of this lifestyle change (Fitouchi et al., 2022). Perceived change in the targets' self-control fully mediated the effect of alcohol indulgence (vs. restraint) on perceived change in cooperativeness; and mediated 71% of its effect on perceived change in moral character (Fitouchi et al., 2022).

This converges with historical and ethnographic evidence. Studies of especially acute moral crusades against drinking ("temperance movements", 19<sup>th</sup> c.) conclude that "in any place where temperance movements developed – alcohol was defined as dangerous, as a problem, in terms of its perceived ability to destroy individual self-control" (Levine, 1993; see also Eisner, 2014; Yeomans, 2011). As Gusfield (1997) summarizes,

Dominating the temperance ethic through much of the nineteenth and early twentieth century was a belief in the sinfulness and degradation of drinking per se. Use of spirits, beer, and wine was *inherently threatening to the self-control that marked the moral and potentially successful person*. Use endangered reputation, social standing, and income, and inevitably brought chronic inebriety *and all its attendant harms*. (Gusfield, 1997, p. 213, emphases added)

Earlier in history, medieval and Early Modern moralists condemned alcohol for "extinguishing reason and dulling the mind", making it "the gateway to other sins" (Martin, 2009, p. 21; see also Adamson, 2004, p. 93). Similar attributions occur in Medieval Chinese Buddhism (Stercx, 2005, pp. 224, 228). The Muslim *Hadith* similarly describes alcohol as "that which befogs the mind" (Michalak & Trocki, 2006, p. 529), making it the "source (literally 'mother') of all evils" (Powell, 2004, p. 97). Further suggesting that moralizations of drinking aim at preventing loss of self-control, they often apply with varying intensity to different groups of people, as a function of their perceived likelihood to lose self-control. For example, the Konso agriculturalists (Ethiopia), who "know only too well what disruptive effects drunkenness can have on social relations", reserved the right to consume alcohol to old men only, "supposed to be milder in their passions than the young, and more self-controlled" (Hallpike, 2008, p. 219; see also traditional Middle East: Mathee, 2014, p. 104).

### **4.3. The praise of piety and ritual observance**

MDT maintains that pious ritual observance is morally praised because it is perceived to cultivate self-control and thus cooperativeness (section 3.2.2). Future research could test whether ritual observance is more strongly moralized by people perceiving regular practice of a religious discipline, such as fasting, meditation, or regular prayer, as an efficient way to increase one's ability to resist temptations—including uncooperative ones. Several lines of evidence suggest the plausibility of this idea.

First, across countries with Hindu, Buddhist, Christian, and secular majorities ( $N > 3,200$ ), religious people are perceived as less likely to commit uncooperative behaviors than non-religious people (Gervais et al., 2017; Gervais, 2013, 2014), and part of this effect may be due to religious people being perceived as regularly cultivating their self-control. Consistent with this possibility, experimental evidence indicates that religious people are perceived not only as more trustworthy, but also as more self-controlled (Moon et al., 2018), and that the perception that they are more self-controlled mediates the relationship between religiosity and greater perceived trustworthiness (Moon et al., 2018). Among religious people, those described as respecting rituals that require exercising self-control (e.g., abstaining from meat during Lent for Christians) are perceived as more trustworthy than religious people who do not, across religious affiliations (Hall et al., 2015; see also Singh & Henrich, 2020). Surveys of both Javanese Muslim and Christian American participants also find that a substantial share of both samples report increasing and expressing self-control as a motivation for fasting (Tamney, 1980, 1986).

These results converge with the fact that puritanical traditions explicitly ascribe self-control-training functions to ritual performance, with the specific aim of facilitating prosocial behavior. Specialists of Confucianism have long noted that “the function of rituals has been seen in China as a kind of block against or prevention of the influence of desires or selfish behavior” (Csikszentmihalyi, 2009, pp. 523–524). By cultivating self-discipline (Slingerland, 2014, pp. 70–80), and “blocking the overflow of desires” (Csikszentmihalyi, 2020, p. 7), ritual propriety was explicitly meant to facilitate prosocial behavior (Csikszentmihalyi, 2004, 2009, 2020; Graziani, 2009; Slingerland, 2014). Similarly in the Christian tradition: “as a Christian virtue, self-control is a product of spiritual discipline, a trait for which the Christian much engage in ‘strict training’” (Spiegel, 2020, p. 1; see also Gaca, 2003; Gorski, 2003). Several ritual practices (e.g., fasting, meditation, self-denial) are “aimed cultivating self-mastery or strength of will”, allowing to “get

the victory over wickedness” or “train the soul to decline genuinely appealing immoral choices” (Spiegel, 2020, pp. 1-12).

In ethnographic studies in Bhubaneswar (India), Odia Hindu report that daily performance of prayers and ablutions “teaches one to exercise self-control and enable one to cultivate self-discipline” (Menon, 2013, p. 204)—qualities they also see as required for doing one’s duties toward others (Menon, 2013, pp. 201, 204). In Muslim Zanzibar, it is similarly acknowledged that the moral character trait of self-control “need[s] constant work and become[s] easier with growing age and piety” (Beckmann, 2010, p. 120; Islam more generally: Rehman, 2019; Garden, 2014), while in the Amhara (Ethiopia), “[t]he rigorous schedule of fasting is believed to help contain one’s passions which could lead to an uncontrollable situation and eventual violence” (Reminick, 1975, p. 29). In Japanese Buddhist culture, practicing an “austere mental and physical discipline that one pursues for decades”, such as rituals or martial arts, is seen as allowing to “become a person of great discipline, character, and compassion”, who is “of far greater service to her neighbors” (Mann, 2011, pp. 74–77).

The moral disciplining theory could further be tested by quantitatively investigating the cross-cultural association between the moral praise of ritual observance and such ascriptions of moral disciplining functions to ritual performance.

#### **4.4. The condemnation of immodest clothing, music, and dances**

MDT proposes that, to prevent social harm, puritanical values do not only prescribe behaviors viewed as improving people’s “inner” self-control (e.g., disciplinary rituals, restraint from bodily pleasures), but also use what psychologists call “preventive” or “situational” strategies for self-control (Duckworth et al., 2016; Hofmann & Kotabe, 2012). Such strategies aim at lowering the demand for self-control by preventing temptations to arise in the first place (Duckworth et al., 2016). This, we have argued, is what modesty norms do by limiting exposure to sexual cues (e.g., female body curves), perceived as triggering hard-to-control sex drives in impulsive males, potentially resulting in uncooperative behaviors (e.g., adultery, sexual aggression) (section 3.2.1.). This hypothesis generates the following predictions.

***4.4.1. The more people perceive male self-control as vulnerable to cue-exposure, the more they should moralize immodesty***

If immodesty is moralized as a risk factor for harmful self-control failures, it should be all the more condemned that people perceive surrounding males as unable to resist sexual urges in the face of cue-exposure. Indeed, if males are believed able to remain peaceful and self-controlled even when exposed to tempting cues, immodesty should lose its (perceived) potential to generate social harm, and should therefore not be condemned. In line with this prediction, Moon et al. (2021) show that the more people stereotype men as unable to control their sexual urges, the more they moralize female immodest clothing and other cue-exposing behaviors (e.g., public breastfeeding). This effect does not generalize to phenomena unrelated to cue-exposure, and holds after controlling for participants' reproductive strategy and other potential confounds (e.g., religiosity, conservatism, benevolent or hostile sexism). This suggests that, although inherently harmless, immodesty is moralized because of its perceived potential implications on male moral self-control (Moon et al., 2021).

#### ***4.3.2. Modesty norms should be well designed to prevent cue-exposure specifically***

Second, modesty norms should specifically target behaviors increasing cue-exposure. This seems to be the case. Eye-tracking experiments show that Islamic clothing decreases visual access to female body curves (Pazhoohi, Macedo, et al., 2017), and accordingly decrease males' rating of female attractiveness (Mahmud & Swami, 2009; Pazhoohi & Hosseinchari, 2014; Sheen et al., 2018). Modest clothing across puritanical traditions specifically hide such sexually arousing stimuli (e.g., Puritans' austere clothing: Bremer, 2009; Islamic veiling: Mernissi, 2011; Jewish *Tznihut* dress: Andrews, 2010; Hindu India: Stephens, 1972, p. 4; Ancient Christian veiling: Tariq, 2013). Psychological evidence indicates that immodesty is more negatively viewed in public—that is, when its cue-exposing effects are amplified (Acker, 2009). The Quran also specifies that elderly women, deemed less attractive, can go unveiled (Mernissi, 2011), and studies of rural Muslim villages report that demands of modesty apply less strongly to elderly women (Antoun, 1968, p. 683; Belghiti, 1969).

Music and dance, similarly, are often condemned as exposing people to auditory and visual stimuli impeding self-control, thus making antisocial behaviors more likely. Islamic warning against the dangers of music insist on its self-control-impeding effects: “music as an activity is about exciting pleasures that make humans slaves to unruly passions” (Kiyimba, 2012, pp. 93–94); and compare music's psychological effects to those of alcohol: “avoid singing for it decreases shame, increases desire...and verily it takes the place of wine and does what

drunkenness does.” (Otterbeck & Ackfeldt, 2012, p. 232). Christian oppositions to dancing often specifically targeted the “mixed” dancing of men and women, exposing people to sexual cues and “lascivious” bodily movements (Wagner, 1997). In early China, Confucius condemned the “immoral, seductive popular music of Zheng”, which “was sung by mixed groups of men and women, and gave rise to sexual improprieties” (Slingerland, 2014, p. 76). In early modern Europe, “plays, songs and, above all, dances were condemned for awakening dangerous emotions and as incitement to fornication” (Burke, 1978, p. 212), while festivals were denounced as “occasions of violence” (Burke, 1978, p. 212). Tellingly, the very same entertainment—music—can become morally *praised* when it takes the form of a disciplined, effortful, and patient activity perceived as cultivating people’s self-control rather than impeding it, thus facilitating prosociality. For example, while he condemned arousing popular music, Confucius prescribed classical musical performance, precisely because the latter “place[s] limits on appetitive desires” and thus “promote[s] unselfishness...and prepare[s] people to behave morally in different domains of their life” (Csikszentmihalyi, 2020, pp. 7,5).

## 5. Explaining the fall of puritanism

Although widespread, puritanical values are not ubiquitous. Their most systematically documented pattern of variation is their decline in particularly rich, WEIRD societies. In line cultural psychological studies (Atari et al., 2022; Haidt et al., 1993; Shweder et al., 1987), the World Value Surveys demonstrate that virtually all societies, when they are made richer by modern economic development, progressively abandon puritanical values (Inglehart, 2018; Inglehart & Baker, 2000). The richest regions of the world (e.g., Western Europe, North America, Australia/New Zealand) show the lowest levels of puritanical values, while the poorest regions (e.g., Africa, Middle East, Communist Asia) exhibit the highest levels (Weeden & Kurzban, 2013). Why does puritanism decline in particularly rich, WEIRD societies?

MDT maintains that people promote puritanical norms to ensure the self-control necessary for cooperative behavior. Puritanical norms, however, have a cost: they restrict people’s enjoyment of highly gratifying pleasures, and impose effortful disciplinary activities. Thus, puritanical norms should be perceived as morally warranted only when they are worth this cost. This should especially be the case in environments where people’s spontaneous self-control is perceived as insufficient to ensure social order and acceptable levels of cooperation—making puritanical norms, precisely aimed at supplementing this fragile self-control, appear necessary. In fact, historians and social scientists have stressed that puritans’ zealous emphasis on maintaining

constant self-control was tied to an “extraordinary fear of disorder and anarchy” (Walzer, 1963, p. 84), alimanted by a pessimistic view of human nature as naturally weak-willed, driven by powerful impulses, and perpetually tempted by selfishness (Sherkat & Ellison, 1997; Luttmer, 2000; Seidman, 1990; Walzer, 1963, 1982).

This reasoning closely parallels the logic of variations in authoritarian values (Nettle & Saxe, 2021), which are associated with puritanical values (Atari et al., 2022; Harper & Rhodes, 2021). Nettle & Saxe (2021) present experimental and cross-national evidence that, in poorer environments, people are more supportive of authoritarian leaders because they expect other people to spontaneously behave less cooperatively. This lower trust in others leads people to view strong leaders, who monitor and punish cheating intransigently, as necessary to ensure acceptable levels of cooperation (Nettle & Saxe, 2021). Just as monitoring and punishment by authoritarian leaders appears less necessary in particularly rich environments, where people view others as spontaneously cooperative (Nettle & Saxe, 2021), we argue that puritanical norms, aimed at disciplining others for cooperation, become unnecessary when people see others as spontaneously self-controlled and trustworthy.

In line with this idea, the particularly rich environments in which puritanism declines lead to the development of more inherently self-controlled psychologies. People living in materially safer environments, compared to people living in poverty, are spontaneously more self-controlled (Dohmen et al., 2018; Pepper & Nettle, 2017; Sheehy-Skeffington, 2020), invest more in extended prosociality (Holland et al., 2012; Lettinga et al., 2020; Nettle, 2015; Silva & Mace, 2014; Zwirner & Raihani, 2020), are less susceptible to impulsive defection or retaliation (McCullough et al., 2012), and have higher trust in others (Alesina & La Ferrara, 2002; Guillou et al., 2021; Petersen & Aarøe, 2015; Ortis-Opsina, 2017).

Material security and higher levels of self-control are also associated with lower spontaneous engagement in the very self-control-impeding behaviors that puritanical norms preemptively restrict. Richer individuals are less susceptible to heavy drinking (Huckle et al., 2010; Lewer et al., 2016), which in turn predicts less alcohol-related “undesirable” outcomes (e.g., physical fights, being away from work) (Huckle et al., 2010). Higher SES predicts lower reward-sensitivity and greater inhibition (Yaple & Yu, 2020), which are associated with lower vulnerability to addiction problems and cue-exposure (Auger et al., 2010; Gullo et al., 2014; Osadchiy et al., 2019; Rømer Thomsen et al., 2018; Story et al., 2014; Volkow et al., 2017). Urges for temperance likely

become useless when people are more moderate anyway, and less likely to develop hard-to-control addictions to bodily pleasures. Prohibitions of alcohol likely become superfluous when people are less susceptible to heavy drinking, and when drinking generates less social problems anyway than in poorer societies (e.g., Medieval Europe: Eisner, 2001, 2003, 2014; Martin, 2009). Prescriptions of religious techniques of self-discipline likely seem unnecessary when people perceive others as disciplined enough to honor their duties.

This hypothesis generates testable predictions: puritanical values should decline when surrounding individuals are perceived as particularly self-controlled and trustworthy. In line with this prediction, recent analyses of the World Value Survey ( $N > 200,000$ ) show that, across more than 100 countries, individuals with puritanical values have lower trust in others—i.e., more belief that surrounding individuals are not spontaneously cooperative. As mentioned above, the more people perceive males as spontaneously sexually self-controlled, the less they support puritanical restrictions of immodesty (Moon et al., 2021). In the United States, Van Leeuwen et al., (2014) find that living in a State where many people have short-term-oriented “life-history strategies” (which relate to lower self-control: Pepper & Nettle, 2017) predicts individual endorsement of purity values more strongly and robustly than any other predictor—including pathogen-prevalence, relevant to disgust-based accounts of purity, but also urbanization, education, social class, and cognitive ability. Similarly, more religious and conservative American states, which are more puritanical, have been found to exhibit the greatest levels of pornography use (Edelman, 2009; MacInnis & Hodson, 2015; Whitehead & Perry, 2018), while prevalence of pornography use in 20 Arab-Muslim countries ( $N > 15,000$ ) has been found to be higher than in some less puritanical countries (e.g., Australia, Italy) (Eljawad et al., 2021). Recent studies find that people holding “binding moral foundations”, which include purity values, tend to be *less* self-controlled than people holding liberal, less puritanical values (Silver & Silver, 2019). The moral disciplining model allows making sense of these apparently paradoxical findings, previously seen as left unexplained (see Silver & Silver, 2019; van Leeuwen et al., 2014): the need to moralize bodily pleasures and self-discipline is felt more strongly when people perceive, by observing others’ behaviors or extrapolating from their own psychology, that surrounding individuals’ ability to resist temptations is not guaranteed, and thus needs to be compensated by puritanical restrictions.

## **6. Extending and discussing the disciplining account**

### **6.1. Self-control and other moralizations**



In this section, we further illustrate the fecundity of the moral disciplining approach, by showing how it can explain other Purity-related moral judgments beyond those considered so far in this article.

### ***6.1.1. Hygiene norms***

Moral psychologists often define Purity as condemning not only bodily pleasures and undisciplined lifestyles, but also dirty and unclean behaviors (Graham et al., 2013; Gray et al., 2022; Kollareth et al., 2022). Moral prescriptions of hygiene may seem, in line with Moral Foundations Theory (Graham et al., 2013), straightforwardly related to disgust and pathogen-avoidance. Yet recent evidence suggests the fecundity of the moral disciplining framework to explain even this part of Purity concerns. In almost 20,000 participants across 56 countries, the restrictiveness of hygiene norms (e.g., against spitting, for handwashing) is more strongly and robustly predicted by the valorization of self-control than by perceived pathogen threat and historical pathogen prevalence—whose effect on the main factor of hygiene norms disappears when self-control values are controlled for (Eriksson et al., 2021). This suggests that not only ascetic restraint, but also the conscientious observance of hygienic practices, may be moralized as an exercise of self-discipline.

### ***6.1.2. “Impure thoughts” and the moralization of mental intimacy***

Puritanical traditions can go as far as moralizing, not only victimless behaviors and private lifestyles, but also the very *mental states* individuals experience, such as the “impure” thoughts and desires they may entertain. In psychological experiments, Christians and Protestant participants judge some mental states (e.g., adulterous desire) to be as immoral as the behaviors that could follow them (Cohen, 2003; Cohen & Rozin, 2001; Siev & Cohen, 2007). Early Church fathers (e.g., Paul, Matthew) insisted that a man looking with desire at a woman *already* commits adultery “in his heart” (Gaca, 2003, pp. 152–153). From the 13<sup>th</sup> c. onwards, Christians were obligated to confess not only their immoral actions but also their sinful thoughts (Tentler, 2015). In the Muslim tradition, the condemnation of *zina* (unlawful, non-marital sex), also extends to mental states such as looking at the body curves of a woman (“*zina* of the eye”) or hearing an unrelated woman’s voice (“*zina* of the ear”) (Bouhdiba, 2012, pp. 38–39; see also Rabbinic Judaism: Hezser, 2018, pp. 15-16).

The moral disciplining account helps explain this phenomenon as a special case of prevention of harmful self-control failures. Picturing oneself enjoying a reward, for example in adulterous or violent thoughts, may be perceived as triggering urges to consume this reward (e.g., sexual pleasure), making people more likely to succumb harmful temptations (e.g., adultery, assault). As written in the most popular Christian devotional book (*The Imitation of Christ*, 15<sup>th</sup> c.), “first there comes into the mind an evil thought: next, a [vivid] picture: then delight, and urge to evil” (Tentler, 2015, p. 156). According to our account, although inherently harmless, mental states and desires are moralized when perceived as critically increasing the probability of harmful self-control failures.

In line with this idea, the puritanical moralization of mental states is often associated with prescriptions of “intra-psychic” self-control techniques (see Duckworth et al., 2016), aimed at detecting the birth of impulses in one’s consciousness to facilitate their self-control. For example, historians have noted that “[i]t was characteristic of puritans to subject themselves to intense self-examination” (Bremer, 2009, p. 38). By meditating frequently, and recording his impulses in moral diaries (Bremer, 2009; Gorski, 1993, 2003), the individual “was to reflect on the sins he was especially prone to commit so that he might guard against those urges” (Bremer, 2009, p. 55). In the Christian tradition more generally, meditation has been construed as a self-control technique that “kills temptation at the root, by producing a mental ‘soil’ that will not sustain the development of illicit desires that lead to vice” (Spiegel, 2020, p. 12). Neo-Confucian traditions under China’s Song, Yuan and Ming Dynasties (10<sup>th</sup>-17<sup>th</sup> centuries) similarly adopted and adapted techniques of meditation used to “detect and undercut selfish inclinations and desires” (Tiwald, 2020). In line with these cases, psychological evidence suggests that the tendency to attribute to others the ability to internally control their mental states and impulses predicts the propensity to moralize mental states (Weiss et al., 2021).

## **6.2. Outstanding questions**

Purity was originally introduced to moral psychology to raise awareness on the cross-cultural variation of morality: beyond the harm- and fairness-centered values of WEIRD societies, morality involves, in more traditional societies, temperance, chastity, and piety (Haidt, 2012; Haidt et al., 1993; Henrich et al., 2010; Shweder et al., 1987). This cross-cultural revolution in moral psychology was essential, and led to systematic documentation of the fall of puritanical values in modern societies (see Section 5; Atari et al., 2022; Haidt et al., 1993). This movement, we suggest, should go one step further.

Indeed, not all traditional societies are puritanical. Available cross-cultural codes suggest that small-scale societies, somewhat similarly to WEIRD societies, exhibit less moral emphasis on sexual restraint and modesty than larger-scale, traditional societies with world religions (Jackson et al., 2020; Murdock, 1949; Stephens, 1972). Ethnographers have reported lax attitudes toward bodily pleasure in various small-scale societies (e.g., !Kung: Lee, 2013; Azande, Central Africa: Evans-Pritchard, 1973; Nivkh: Shternberg, 1933; Chuckchee, Northeast Asia: Broude, 1996; Trobriander, Papua New Guinea: Malinowski, 1929; Weiner, 1988; Intuit: Hoebel, 2009). Even in larger-scale traditional societies, puritanical values seem not to always have been so prevalent than in the societies mentioned by initial emphases on Purity (e.g. contemporary India, rural Brazil; Haidt, 2012; Haidt et al., 1993; Shweder et al., 1987). Puritanical values appear to have increased in Ancient Rome between the late Republic and the early Empire (Duby et al., 1994; Norena, 2007; Rousselle, 2013; Veyne, 1978; see also Gaca, 2003). In China, while bodily pleasures appear less restricted in Antiquity (Goldin, 2017; Hinsch, 1994; Wells & Yao, 2015), starting with the Tang and continuing through the Song, the Yuan, the Ming and the Qing, self-discipline, bodily pleasures, asceticism are increasingly moralized (Benn, 2005; Sommer, 2000; Suiming, 1998; Wells & Yao, 2015; Yü, 2021). In medieval Europe, historical work similarly documents an increasingly strict policing of lack of self-control, sexual misconducts, alcohol consumption, and lax religious observance, culminating in the moralistic religious movements of the Early Modern period (Burke, 1978; Ingram, 1990, 1996; Martin, 2009; McIntosh, 2002).

In other words, the focus on the WEIRD/non-WEIRD dichotomy (Henrich et al., 2010) may have obscured substantial variation in puritanical values among non-WEIRD societies themselves, potentially limiting our understanding of the cross-cultural variation that psychological theories must account for. Furthering our understanding of the psychological origins of puritanical values, and testing predictions of various theories, requires the field to move forward a systematic, quantitative documentation of the full spectrum of puritanical values' variations across human societies.

## **7. Conclusion**

Many societies develop apparently unnecessarily austere norms, depriving people from the harmless pleasures of life. In face of the apparent disconnect of puritanical values from cooperation, the latter have either been ignored by cooperation-centered theories of morality, or been explained by mechanisms orthogonal to cooperative challenges, such as concerns for the

purity of the soul, rooted in disgust intuitions. We have argued for a theoretical reintegration of puritanical morality in the otherwise theoretically grounded and empirically supported perspective of morality as cooperation. For deep evolutionary reasons, cooperation as a long-term strategy requires resisting impulses for immediate pleasures. To protect cooperative interactions from the threat of temptation, many societies develop preemptive moralizations aimed at facilitating moral self-control. This may explain why, aside from values of fairness, reciprocity, solidarity or loyalty, many societies develop hedonically restrictive standards of sobriety, asceticism, temperance, modesty, piety, and self-discipline.

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## Conflict of interest

None

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