Embodied Self-Control

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Abstract

    "Self-control" refers to the ability to regulate one's own thoughts, emotions, and behaviors, especially when an agent experiences some form of motivational opposition such as the temptation to do otherwise or a general state of diminished motivation. This ability is a mental one, and thus has traditionally been assumed consist of a process that belongs solely to the brain. The emergence of situated cognition - the view that the mind does not exist solely in the brain, but also necessarily involves external factors such as the body, the immediate environment, and social networks - allows for a new perspective of how self-control works. While some have applied the concept of situated cognition to self-control, there has yet to be a fully situated theory of self-control developed within the literature. This thesis aims to make precisely this contribution, namely, to argue for a situated model of self-control.

    The first chapter of the thesis is a paper titled "Breaking Beyond the Borders of the Brain: Why Self-Control is a Situated Phenomenon". This paper argues that an effective and efficient theory of self-control necessarily requires adopting a situated perspective. Empirical evidence reveals that the brains of individuals who experience chronic failures of self-control (e.g. addicts and procrastinators) are such that recruiting the purely brain-based self-control resources are increasingly more difficult. In this sense, self-control theories that constrict this ability to only the brain provide *inefficient* strategies for dealing with self-control dilemmas, as such strategies will be increasingly more difficult to access for individuals who have had previous experiences of self-control failures. Furthermore, the paper argues that such purely brain-based strategies will also be *ineffective* due to empirical evidence which suggests that external factors such as the body, the immediate environment, and social networks might actually be necessary for successful self-control.

    The following chapter of the thesis is a paper titled "Putting the Mind Back Together: A Situated Model as an Alternative to the Divided Mind View". This paper focuses on dual-process theories of self-control, which portray self-control as an ability belonging to one of two distinctly separate motivational processes within the brain. More specifically, such views posit that self-control belongs to the process responsible for slow and deliberate rational thinking, as opposed to the process responsible for quick and automatic impulsive thinking. The paper raises two explanatory challenges for such a view: accounting for the role that emotions likely play in certain instances of self-control, and the role that situational factors (i.e. the body, the immediate environment, and social networks) appear to play in self-control. The paper then presents the situated model of goal-orientated behavior as an alternative view that circumvents these explanatory challenges because this model incorporates the roles of emotions and situational factors. The model is designed to present a more accurate representation of how self-control actually works based on emerging empirical evidence.

    The last chapter of the thesis is a paper titled "Fighting Fire with Fiero: Using Pride to Combat Wayward Desires". This paper suggests that a likely candidate for what can be called a "self-control emotion" is authentic pride. The physical expression of pride, it is argued, can potentially be utilized by an agent within a self-control dilemma to significantly increase the likelihood of successful self-control without having to rely on consciously deliberate mental efforts. Empirical evidence linking the various components of the physical expression of pride

(e.g. posture) with the successful self-control supports the suggestion. While the preceding papers argue for situated self-control in general and remain, for the most part, agnostic as to which situated factor is most important for successful self-control in moments when an agent is faced with motivational opposition, this paper makes a stance on this issue. While the immediate environment and social networks are surely important factors for the likelihood of successful self-control, the body is arguably the most accessible situated factor in moments when an agent is faced with motivational opposition. This paper works to present a concrete example of exactly how the body can be manipulated in order to produce the relevant behavior, while the emotion works as a bridge between the physical state and the behavioral state of the agent.

  Taken together, the three papers form an argument that a situated theory of self-control - primarily an embodied theory - is superior to non-situated theories which assume that the brain alone is responsible for successful self-control. The true virtue of an embodied theory of self-control is that such a theory provides much more effective and efficient solutions for self-control dilemmas. Impulse control disorders have become such a prevalent clinically diagnosed psychological disorder that the fifth edition of the American Psychological Association's Diagnostic and Statistical Manual of Mental Disorders has dedicated an entire chapter to the matter. At the same time, traditional therapies have a low success rate and take years of counseling before any results can be observed. The need for more effective and efficient strategies urges for a paradigm shift, and a very promising solution is a situated theory of self-control.

Abstrakt

„Selbstkontrolle" bezieht sich auf die Fähigkeit, die eigenen Gedanken, Emotionen und Verhaltensweisen zu regulieren, insbesondere dann, wenn ein Akteur irgendeine Form von motivational Opposition erfährt, wie die Versuchung, etwas anderes zu tun, oder einen Zustand allgemein verminderter Motivation. Diese Fähigkeit ist eine mentale und wird daher traditionell als auf einem Prozess basierend angesehen, der ausschließlich im Gehirn stattfindet. Die Entwicklung einer situierten Theorie von Kognition - der Ansicht, dass der Geist nicht nur im Gehirn existiert, sondern notwendigerweise auch externe Faktoren wie den Körper, die unmittelbare Umgebung und soziale Netzwerke umfasst - ermöglicht uns eine neue Perspektive auf die Funktionsweise von Selbstkontrolle. Einige haben zwar bereits den Begriff der situierten Kognition auf Selbstkontrolle angewendet, eine umfassende situierte Theorie der Selbstkontrolle wurde bisher aber noch nicht entwickelt. Diese Arbeit zielt darauf ab, genau diesen Beitrag zu leisten, und für ein situiertes Modell der Selbstkontrolle zu argumentieren.

Das erste Kapitel der Arbeit ist ein Artikel mit dem Titel „Über die Grenzen des Gehirns hinweg: Warum Selbstkontrolle ein situiertes Phänomen ist". In diesem Aufsatz argumentiere ich dafür, dass eine effektive und effiziente Theorie der Selbstkontrolle zwingend erfordert, dass wir eine lokalisierte Perspektive einnehmen. Empirische Daten zeigen, dass das Gehirn von Personen, bei denen chronische Störungen der Selbstkontrolle auftreten (z. B. Süchtige und Prokrastination betreibende) so beschaffen ist, dass die Zuhilfenahme von rein gehirnbasierten Ressourcen zur Selbstkontrolle maßgeblich erschwert ist. Dementsprechend bieten Theorien der Selbstkontrolle, die diese Fähigkeit nur auf das Gehirn beschränken, nur *wenig effiziente* Strategien für den Umgang mit den Dilemmata der Selbstkontrolle, da solche Strategien für Personen, die bereits negative Erfahrungen mit Selbstkontrolle gemacht haben, immer schwieriger zugänglich werden. Darüber hinaus argumentiere ich in dem Aufsatz, dass solche rein gehirnbasierten Strategien auch *wenig effektiv* sind, da empirische Belege darauf hindeuten, dass externe Faktoren wie der Körper, die unmittelbare Umgebung und soziale Netzwerke tatsächlich für eine erfolgreiche Selbstkontrolle erforderlich sind.

Das folgende Kapitel der Arbeit ist ein Artikel mit dem Titel „Den Geist wieder zusammensetzen: Ein situiertes Modell als Alternative zur Auffassung des geteilten Geistes". Dieser Aufsatz konzentriert sich auf Zwei-Prozess-Theorien der Selbstkontrolle, die Selbstkontrolle als eine Fähigkeit darstellen, die zu einem von zwei klar getrennten motivatonalen Prozessen im Gehirn gehört. Diese Ansichten gehen insbesondere davon aus, dass Selbstkontrolle zu dem Prozess gehört, der für langsames und bewusstes rationales Denken verantwortlich ist, im Gegensatz zu dem Prozess, der für schnelles und automatisches impulsives Denken verantwortlich ist. Der Aufsatz wirft zwei explanatorische Herausforderungen für eine solche Perspektive auf: die Berücksichtigung der Rolle, die Emotionen in bestimmten Fällen der Selbstkontrolle wahrscheinlich spielen, und die Rolle, die situierte Faktoren (d.h. der Körper, die unmittelbare Umgebung und soziale Netzwerke) für Selbstkontrolle zu spielen scheinen. Der Aufsatz präsentiert dann ein alternatives situiertes Modell zielorientierten Verhaltens, das mit diesen explanatorischen Herausforderungen umgehen kann, da dieses Modell die Rolle von Emotionen und situierten Faktoren berücksichtigt. Das Modell soll eine genauere Darstellung der

tatsächlichen Funktionsweise der Selbstkontrolle auf der Grundlage neuer empirischer Erkenntnisse liefern.

Das letzte Kapitel der Arbeit ist ein Artikel mit dem Titel „Mit Fiero gegen Feuer kämpfen: Mit Stolz eigensinnigen Wünschen entgegenwirken". Dieser Aufsatz legt nahe, dass authentischer Stolz ein plausibler Kandidat für eine sogenannte „Selbstkontroll-Emotion" ist. Ich argumentiere dafür, dass der physische Ausdruck von Stolz möglicherweise von einem Akteur in einem Selbstkontroll-Dilemma genutzt werden kann, um die Wahrscheinlichkeit einer erfolgreichen Selbstkontrolle signifikant zu erhöhen, ohne sich auf bewusst beabsichtigte mentale Anstrengungen verlassen zu müssen. Empirische Belege, die die verschiedenen Komponenten des physischen Ausdrucks von Stolz (z. B. Körperhaltung) mit erfolgreicher Selbstkontrolle verbinden, stützen diesen Vorschlag. Während ich in den anderen beiden Aufsätzen für situierte Selbstkontrolle im Allgemeinen argumentiere und dazu, welcher situierte Faktor für eine erfolgreiche Selbstkontrolle in Momenten, in denen ein Akteur mit motivationalem Widerstand konfrontiert ist, am wichtigsten ist, agnostisch bleibe, beziehe ich in diesem Aufsatz zu diesem Thema Stellung. Während die unmittelbare Umgebung und die sozialen Netzwerke sicherlich wichtige Faktoren dafür sind, wie wahrscheinlich eine erfolgreiche Selbstkontrolle ist, ist der Körper in Momenten, in denen ein Akteur mit motivationalem Widerstand konfrontiert ist, wohl der am besten zugängliche Faktor. In diesem Artikel wird ein konkretes Beispiel dafür vorgestellt, wie der Körper manipuliert werden kann, um das relevante Verhalten zu erzeugen, während die Emotion als Brücke zwischen dem physischen Zustand und dem Verhaltenszustand des Akteurs fungiert.

Zusammengenommen liefern die drei Arbeiten ein Argument dafür, dass eine situierte Theorie der Selbstkontrolle - in erster Linie eine verkörperlichte Theorie - nicht situierten Theorien überlegen ist, die davon ausgehen, dass nur das Gehirn für erfolgreiche Selbstkontrolle verantwortlich ist. Der wahre Vorteil einer situierten Theorie der Selbstkontrolle besteht darin, dass eine solche Theorie viel effektivere und effizientere Lösungen für Dilemmata der Selbstkontrolle bietet. Impulskontrollstörungen sind zu so weit verbreiteten klinisch diagnostizierten psychischen Störungen geworden, dass die fünfte Edition des *Diagnostic and Statistical Manual of Mental Disorders* der *American Psychological Association* ihnen ein ganzes Kapitel gewidmet hat. Gleichzeitig weisen traditionelle Therapien eine geringe Erfolgsquote auf und erfordern jahrelange Beratung, bevor Ergebnisse beobachtet werden können. Die Notwendigkeit effektiverer und effizienterer Strategien erfordert einen Paradigmenwechsel, und eine situierte Theorie der Selbstkontrolle bietet dafür eine vielversprechende Lösung.

Introduction

1. The Puzzle of Synchronic Self-Control

Self-control is highly revered and coveted. Having high self-control is associated with academic achievement (Duckworth & Seligman, 2005), happiness (Hoffman et al., 2014), emotion regulation (Boden & Thompson, 2015), higher SAT scores[1] (Mischel et al., 1989), healthy body mass index (Schlam et al., 2013), competence (Mischel et al., 1988) and coping with social rejection (Ayduk et al., 2000), just to name a few. Conversely, low self-control is linked with a variety of negative life circumstances, such as academic underachievement, unhealthy habits, and engagement in criminal activity (Moffitt et al., 2011). The general consensus that self-control is the key to ensuring the best possible life is evident by the massive selection of self-help books and programs, as well as the booming business of motivational gurus and life coaches, all teaching people how to be in control of their own thought patterns, emotional impulses, and behaviors. Each person has some goals that they want to achieve, ranging from humbly small to ambitiously large, and all people have, at some point in their lives, encountered some motivational opposition to their goals. Motivational opposition can be in the form of a competing motivation, such as a temptation to do otherwise, or a lack of motivation to pursue the goal despite having the desire to achieve it, such as the diminished motivation that often accompanies depression. These moments where an agent encounters some strong motivational opposition to her goal(s) marks a self-control dilemma and finding solutions for self-control dilemmas has been a mission for laypersons and academics alike.

Successful self-control occurs when an agent who finds herself in a self-control dilemma is able to overcome the motivational opposition and act according to her goal. This type of self-control, called *synchronic self-control,* occurs *at the same time* that an agent is facing some motivational opposition. *Diachronic self-control*, on the other hand, refers to any instances or strategies that are deployed in anticipation of encountering some motivational opposition in the near future, preparing the agent *before* the opposition arises.

The concept of synchronic self-control imports a perplexing puzzle, which can be explained in three seemingly[2] true claims:

(1) If an agent is free to perform any action she wishes, and performs action X intentionally, it is generally agreed that the agent is most motivated to perform X

(2) In a self-control dilemma, the strongest motivation is the one which an agent must avoid[3]

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[1] The SAT is a standardized exam that students take in high school. The scores of this exam are used by colleges nationwide in the United States to make admissions decisions.

[2] The truth of these claims has since been debated, but the puzzle is a point of initiating the question that is asked at the end of this section: how is self-control possible?

[3] The puzzle of synchronic self-control applies directly to self-control dilemmas involving competing motivations, such as the classic temptation cases. However, some have discussed the puzzle of synchronic self-control within the context of lacking motivation (e.g. Connor, 2014), despite the less clear application to such cases.

(3) Any instance of being successfully self-controlled while facing
motivational opposition involves an agent performing an action which
she is both *most* motivated to perform - according to (1) - and, at the
same time, *less* motivated to perform - according to (2).

Since an action cannot be both most motivated and less motivated, it appears that synchronic self-control is a paradox, even though there are (arguably) many cases where people are successfully self-controlled in the face of motivational opposition (e.g. all the smoking quitters who have actively fought their cravings for cigarettes). This puzzle reveals a highly important question that has rallied quite a lot of philosophical attention: how is self-control possible? Most of the prominent theories of self-control aim to answer this precise question.

2. The Self-Control Literature

Currently, the self-control literature is difficult to navigate, partly due to its sheer volume, but mainly because of all the overlapping sub-debates that arise in answering the question of how it is possible for an agent to be self-controlled.

2.1 Classic sub-debates within the literature

One of the classic sub-debates, for example, asks whether self-control is an action proper or if it is better construed as a non-actional happening, more akin to a reflex than an intentional act (Connor 2014; Kennett & Smith, 1996). Another sub-debate is concerned with whether the terms used in the literature refer to the same thing or different phenomenon; one example is the potential distinction between self-control and willpower (Holton, 2003; Henden, 2008); another example is the distinction made between self-control and self-regulation (Fujita, 2018), even though these terms are often used interchangeably. Perhaps the most famous and contentious sub-debate asks if self-control is like a muscle, with a finite reservoir of resources that can be depleted, or if depletion is not a matter of concern (Baumeister et al., 2007; Xu et al., 2014; Baumeister et al., 2018). Furthermore, it is debated whether self-control is exclusively the product of reason or if emotion can play a genuinely causal role (Sripada, 2014; Mele, 2012). These are just some of the most popular sub-debates within the literature, and all arise from criticisms of proposed explanations for how synchronic self-control is possible.

Another important feature that makes the literature confusing is the lack of consensus on a single definition of self-control. While generally all self-control theorists agree that they are discussing an ability, there is less agreement on precisely what this ability does. Some give a narrow definition, such as claiming that self-control is not much more than the ability to inhibit or suppress wayward desires (Sripada, 2014). Others posit that the ability consists in sacrificing immediate smaller gratifications for future larger rewards (Mischel, 2014; Weir, 2012). Some allude to a very broad notion by including any strategy that gets the agent to stick to her goals (Kennett & Smith, 1996; Mele, 1992; 2012). All these varied differences work to confuse rather than clarify the concept of self-control, which substantially increases the difficulty to give a coherent explanation for how synchronic self-control is possible.

2.2 The goal of this dissertation

The goal of this dissertation is to provide an alternative view, specifically an embodied theory of self-control. Embodied self-control has been suggested by some theorists (e.g. Balcetis & Cole, 2009; Hung & Labroo, 2011), but has not been systematically argued for within the literature. By applying the concept of situated cognition - the general view that the mind is not constricted to the brain alone, but rather necessarily involves extra-cranial factors such as the body, the immediate environment, and the society (Walter, 2014) - to a theory of self-control allows for a more accurate and useful view of this ability. A situated view of self-control: (a) circumvents the puzzle of synchronic self-control by extending the discussion beyond internal motivations, and (b) redefines willpower as a system of corresponding parts rather than as a single modular (and rather mysterious) ability. Such a view is also superior to non-situated theories because it is able to take into account the kind of situational data that is typically used to mount criticism and rejection of capacities such as free will, stable character traits, and the ability to regulate one's own behavior in the face of motivational opposition (e.g. Doris, 1998; Fujita, 2011; Milyavskaya & Inzlicht, 2017).

I develop an *embodied* version of such a view, as bodily states - as opposed to immediate environments and social structures - appear to be the most accessible part of the self-control system that can be manipulated by the agent *at the same time* that she is experiencing some motivational opposition. Take, as an example, a dieting agent who is faced with a tempting slice of chocolate cake. For such an agent to directly manipulate her own mental states is quite difficult, and the more failed diets that are in this agent's history, the harder it will be for her to simply convince herself to stay away from the cake (see Breaking Beyond the Borders of the Brain: Self-Control is a Situated Phenomenon for a detailed argument for this claim). On the same note, there is not much that an agent who is facing this temptation can do about her current social support, especially if she finds herself alone with the cake, or in a social situation where it might be awkward and inappropriate to avoid eating the cake, such as being a guest at a dinner party where everyone is indulging in the tasty dessert prepared and served especially by the host. Both of these features, using "traditional willpower" or setting up special social support, can be part of a diachronic strategy, preparing the agent before the temptation strikes, but highly difficult, if not impossible, to engage in the moment. At the same time, changing some relevant feature of her environment is a more likely synchronic strategy, such as throwing away the piece of chocolate cake that is tempting this dieter, or putting on some empowering music to increase her strength of will (again, this will not work so well in the dinner party situation). I believe, however, that this is not as easy for the agent to do as is simply changing some relevant bodily state, such as clenching her fists to make herself stick to her diet (Hung & Labroo, 2011; see Fighting Fire with Fiero: Using Pride to Overcome Temptation for a detailed list of relevant bodily states for overcoming temptation).

For these reasons, the goal of this dissertation is to provide arguments that embodied self-control is an effective and efficient strategy that any agent can deploy when faced with motivational opposition. Before such arguments can be offered, however, it is helpful to first sketch an accurate and empirically supported model of how the self-control system operates

without motivational opposition being present, and to identify how the presence of motivational opposition then changes the flow of this process.

3. The Situated Model of Goal-Oriented Behavior

One of the major contributions of this dissertation is to introduce the situated model of goal-oriented behavior in order to explain situated self-control. The description in this section is taken directly from Putting the Mind Back Together: A Situated Model as an Alternative to Dual-Process Theories of Self-Control, which is the paper that first introduces this model.

3.1 Situated model of goal-oriented behavior

The situated model of goal-oriented behavior (henceforth, the situated model) involves several elements that operate in an interdependent way to translate a particular goal into the corresponding goal-oriented behavior. The goal-oriented behavior can be any action performed in *pursuit of the goal* (e.g. remaining on a diet to pursue the goal of being able to fit into a particular size of jeans), or any action that *achieves the goal* itself (e.g. completing an assignment on a particular due date), depending on the kind of goal the agent holds (i.e. ranging from the more concrete and immediate to the more abstract and future-based).

Before an agent can intentionally perform the relevant goal-oriented behavior, she must be in the relevant mental state. The relevant mental state has two dimensions: the perceptual and the emotional. The perceptual dimension involves any implicit beliefs or perceptions regarding her own self. The relevant implicit beliefs or perceptions that produce the appropriate goal-oriented behavior include: perceiving oneself as autonomous and competent (Ryan & Deci, 2000); being gritty, which consist in a recognition of one's own passion(s) and being perseverant in the face of longterm challenges (Duckworth, 2016; Duckworth & Quinn, 2009); believing that one's skills and abilities are malleable and able to be improved (Burnette et al., 2013; Dweck, 2017); having high self-esteem (Vandellen et al., 2012; Agroskin et al., 2014); and acknowledging one's own achievements (Tracy, 2016). Conversely, if an agent perceives herself to have low autonomy, as incompetent, as having no passion or reasons to be persistent, believing that her skills are fixed and unchangeable, having generally low self-esteem and believing that she has never achieved anything worthwhile, then she will not be in a position to *intentionally* initiate the appropriate goal-oriented behavior. How can one pursue a goal without the belief that one can actually do it?
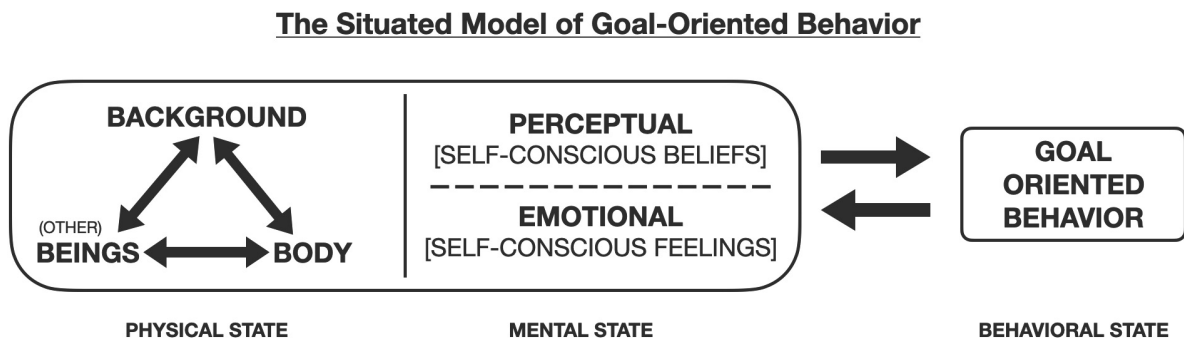
The emotional dimension of the agent's relevant mental state refers to the affective feeling that reflects the beliefs within the perceptual dimension. This dimension contains self-conscious emotions, that is, emotions that arise in response to reflecting on the self (Lewis, 2011). Self-conscious emotions include embarrassment, jealousy, empathy, shame, guilt, hubris, and pride, although it is not yet clear whether all of these emotions actually participate in directly motivating goal-oriented behavior. The positive relationship between pride and goal-oriented behavior has received significant empirical attention (Tracy, 2016). It should be noted here that these studies which reveal the role that pride plays in directly motivating goal-oriented behavior make a distinction between authentic pride and hubristic pride. Pride is a positive emotion that is

felt when one privately reflects upon one's own accomplishments or positive qualities. Hubris, on the other hand, is a public display of fake pride that is expressed in order to compensate for some sort of deficiency that one perceives about oneself. It is not very surprising that authentic pride has been correlated with self-control, as the beliefs that matter for goal-oriented behavior (e.g. positive beliefs regarding one's own autonomy, competence, resilience, etc.) are precisely the type of beliefs that an authentically proud agent is likely to hold about herself. Similarly, some studies investigate the relationship between shame and goal-oriented behavior. Such studies reveal that both anticipated and occurrent shame is associated with *failures* of self-control (Patrick et al., 2009; Leach & Cidam, 2015). Unfortunately, the list of research conducted to test the relationship between self-control and self-conscious emotions is quite short, and further investigation is required. The observations that pride and shame both impact self-control, however, should be sufficient reason to warrant such investigations.

According to the situated model, the relevant perception of self, and the corresponding self-conscious emotions, are constituted by an interplay between three extra-cranial factors, which I refer to as the three B's: the body, the background, and other beings. The three B's comprise the physical state of the agent. The body includes the agent's brain, nervous system, organs, limbs, internal bodily processes (e.g. breathing, blood pressure, hormone regulation, etc.), and anything else that can be said to belong to a human body. The agent's background refers to her immediate environment, including objects or tools that she can interact with and utilize. Other beings are the living organisms involved in the agent's social networks, including other human beings and animals.

There is a considerable amount of empirical evidence which shows that manipulating one of the three B's has a significant effect on the relevant mental states (i.e. either emotion or perception); there is also some evidence which shows that manipulating one of the three B's has an effect directly on the self-controlling behavior. Certain bodily states, such as hormones (e.g. Ali et al., 2018), breathing rates (e.g. Philippot & Blairy, 2010), posture (e.g. Carney et al., 2010; Carney et al., 2015), nutrition (e.g. Strang et al., 2017), facial expressions (e.g. Soussignan, 2002), and movements (e.g. Casasanto & Dijkstra, 2010) causally impact mental states associated with goal-achievement. Specific to self-controlling behavior, clenched muscles (Hung & Labroo, 2011) and the urge to expel waste (Tuk et al., 2011; Zhao et al., 2019) directly affect the capacity to be self-controlled. Similarly, certain backgrounds, that is, features of an agent's immediate environment, such as certain colors (for a review, see Elliot, 2015), fragrances (for a review, see Sowndhararajan & Kim, 2016), and cluttered work spaces (McMains & Kastner, 2011) also have causal influence over certain relevant mental states. For self-control in particular, natural environments (Gamble et al., 2014) or urban environments (Newman & Brucks, 2016) have been shown to have a restorative effect on vital self-control resources. Lastly, the beings with whom an agent shares relationships and social interactions also matter for specific mental states, as evident by the significant effects of living in socioeconomically disadvantaged neighborhoods (Hackman et al., 2010), being married (Holt-Lunstad et al., 2008), and having pets (Brooks et al., 2018). Directly applicable to self-control are the concepts of social trust (Michaelson et al., 2013) and social support (Liu et al., 2016). To sum up, an agent's overall physical state (i.e. the interplay between the three B's) has the power to create or reinforce a particular mental state (i.e. perceptions and emotions), which then, in turn, causes a subsequent

behavioral state (i.e. the goal-oriented behavior). In this sense, the mental state acts as a bridge between the physical state and the behavioral state of the agent within this process of motivating goal-oriented behavior.

The Situated Model of Goal-Oriented Behavior

Once the agent reaches the behavioral state, the causal chain reverses direction. Successfully performing the goal-oriented behavior creates or reinforces the mental state of the agent (i.e. implicit beliefs about the self and certain self-conscious emotions) and produces relevant changes in the physical state of the agent. Perhaps the most salient changes happen in the agent's body: brain activity changes, hormones are released, posture is adjusted, etc. There could be some observable changes with how an agent interacts with or perceives her environment; perhaps she begins to notice more vividly pleasant stimuli such as colors or smells, or just generally have a more positive appreciation of her surroundings. It is certainly very likely that there will be changes in how the agent interacts with other beings, such as exuding more confidence and being more outgoing, or a diffusion of social awkwardness during interactions.

The situated model depicts how a goal is translated into a goal-oriented behavior in the absence of any opposition. However, quite often motivational opposition arises and disrupt this process. By identifying where within this process that motivational opposition arises, a situated solution can be implemented to overcome the opposition while offloading the bulk of the pressure from the brain having to do all the self-controlling work.

3.2 Overcoming motivational opposition

When motivational opposition arises, it originates somewhere within the three B's. Temptation, for example, usually occurs when an agent's background contains some object that triggers a wayward desire (e.g. chocolate cakes for dieters, cigarettes for agents who are trying to quit smoking, the "watch next episode" button flaunted by Netflix, etc.). Diminished motivation often occurs because of imbalances within bodily states (e.g. not enough sleep, diet that lacks energizing nutrients, hormonal fluctuations, etc.). However, temptation can also occur because of imbalances within bodily states (e.g. craving cake is more common when one experiences low blood sugar) and diminished motivation can occur because of one's background (e.g. trying to work when one is snuggled up in a comfy sleep-inducing bed with the television tuned to an

interesting show). Beings with which one consorts can also cause either type of opposition (e.g. attractive young ladies and gentlemen being a source of temptation for married folks, or lazy friends that coax us to lay around on the couch and not do much of anything).

When motivational opposition arises within the three B's, the corresponding mental state that is produced most likely involves negative appraisals of self and corresponding negative self-conscious emotions (e.g. perceiving low competence and the subsequent shame in the lack of one's own capacity to produce changes), and thus drastically increases the likelihood of weak-willed behaviors (i.e. performing any action that is contrary to one's goal). While having an imbalance with just one B will have a lower probability of producing a negative mental state, an imbalance in two or all three B's raises the stakes. For example, if an agent's body is off due to poor sleep, bad nutrition, and lack of exercise, but her background is set up with positive stimuli and the beings in her life are highly supportive, there is a smaller chance that she will have the negative perceptions and emotions that lead to weak-willed behavior. However, if this agent also finds herself within an environment filled with temptation triggers and her social relationships poorly support her goals, then it is highly unlikely - perhaps even impossible - that she will have the relevant positive mental state that is required to produce goal-oriented behavior. Thus, increases in the imbalance of an agent's physical state results in an increasingly negative mental state, and produces weak-willed behavior that is in direct opposition to goal achievement.

In order to fix this imbalance and increase the probability of achieving the goal by producing the appropriate goal-oriented behavior, the relevant mental state needs to be reestablished. However, as mentioned before, the most efficient and effective way to reestablish the proper mental state is not to target the mental state by itself, but to change it through the factors that skewed it to begin with, namely, by reestablishing order amongst the three B's.

When an agent's goal is already being threatened by motivational opposition, the easiest "B" to access is the body. Making relevant changes in one's immediate environment or social networks can be incredibly difficult when in the throes of fighting some occurrent motivational opposition, but an agent always has access to changing certain aspects of her bodily state (e.g. posture, facial expression, or breathing pattern). Manipulating particular bodily states can be sufficient to overcome the threat to the goal by recalibrating the appropriate mental state. Once the threat is overcome and the agent is back to pursuing or achieving her goal, then the other B's can be rebalanced in order to prepare for and guard against future threats. Rebalancing one's background can be achieved by either removing potential temptation triggers (e.g. throwing away all unhealthy snacks if one is on a diet) or adding some environmental "triggers of strength" (e.g. pictures of beautiful thin people, or motivational posters). The effects caused by beings in one's life can also be rebalanced by either severing social ties with certain unhelpful individuals (e.g. recovering addicts ending relationships with other drug users), or creating relationships with those that offer support (e.g. attending weekly meetings with other recovering addicts).

Manipulating one's own bodily state while experiencing some sort of motivational opposition can be performed deliberately, if the agent is consciously aware that she is in the midst of this self-control dilemma, or such bodily changes can occur reflexively. There are already certain bodily reactions that are instinctual for humans, such as tensing one's muscles when pain is either being anticipated or experienced in order to increase endurance, but it also

isn't difficult to train such reactions. Muscle memory can be trained in as little as two thirty-minute sessions (Celnik et al., 2006). Moreover, there is even evidence which suggests that muscle memory can be trained through action observation alone (Stefan et al., 2005). This can be an extremely useful alternative strategy for when an agent isn't capable of deliberately manipulating her own mental state directly, since the relevant mental changes can still be indirectly achieved through the body's subconscious reactions.

The situated model is the underlying basis that unifies the three papers included within this dissertation. The first paper begins by arguing for the crucial role that the three B's play within this system. The second paper argues for the emotional dimension of the system. The third and final paper outlines how the body can be used to create the relevant mental state (both perceptual and emotional, albeit placing emphasis on the emotional) that causes goal-orientated behavior. The following section provides a more detailed synopsis of each paper.

4. Synopsis of Papers

The three papers included in this thesis progressively argue for an embodied theory of self-control. Each paper is organized as its own freestanding paper, including its own central argument, yet they can be read in succession as three chapters amounting up to the final conclusion that synchronic self-control is possible by utilizing the power that certain bodily states have in creating or reinforcing the relevant perceptions that cause the corresponding goal-orientated behavior(s).

The first paper - Breaking Beyond the Borders of the Brain: Self-Control is a Situated Phenomenon - argues that any intracranialist theory of self-control, that is, a theory that constricts self-control to the brain alone, is neither helpful nor accurate. Such theories are not helpful in the sense that any strategy of self-control that is derived from an intracranialist view decreases in its efficacy with increases in how strongly an agent needs such strategies. In other words, the more chronic that failures of self-control are for an agent, such as in cases of addiction or extreme diminished motivation of clinically depressed agents, the less helpful intracranialist strategies become. A second and more important argument points to the fact that actual instances of successful self-control appear to fundamentally depend on certain bodily states, certain environments, and certain social interactions. Taken together, these arguments strongly suggest that self-control is indeed a situated phenomenon.

The second paper - Putting the Mind Back Together: A Situated Model as an Alternative to Dual-Process Theories of Self-Control - presents the model of goal-oriented behavior as an alternative to the Divided Mind view, a version of a dual-process theory applied directly to explain self-control. Two explanatory challenges are raised for the Divided Mind view: (1) accounting for the role that emotions likely plays in motivating self-control, based on evidence from moral psychology that emotions play a role in motivating moral behavior, and (2) accounting for the role that situated factors (i.e. the body, the immediate environment, and social networks) appear to play in self-control. The situated model integrates both of these aspects into its basic foundation, thus is able to account for this evidence must easier than the Divided Mind

view. Two additional reasons that support the situated model over dual-process theories of self-control are discussed.

The third paper - Fighting Fire with Fiero: Using Pride to Overcome Temptation - nominates pride as a candidate for a self-control emotion. The paper points out the ways in which the physical expression of pride, broken down into four main components (i.e. clenched muscles, expanded posture, "fierce" facial expression, and vocalization), correlates with producing mental states that are relevant for successful self-control.

Collectively, the three papers argue, in succession, for an embodied theory of synchronic self-control. Since it is well established that the mental state (i.e. specifically, the perceptual aspect) of the agent matters for successful self-control, the papers focus primarily on showing the necessity of the physical state (i.e. the 3 B's) and the emotional aspect of the mental state, with pride as the main candidate, in successfully producing goal-orientated behavior when the goal is threatened by motivational opposition.

Works Cited

Agroskin, D., Klackl, J., & Jonas, E. (2014). The Self-Liking Brain: A VBM Study on the Structural Substrate of Self-Esteem. *PLoS ONE, 9,* 1-8.

Ali S. A., Begum T., & Reza F. (2018). Hormonal influences on cognitive function. *Malaysian Journal of Medical Science, 25,* 31–41.

Ayduk O, Mendoza-Denton R, Mischel W, Downey G, Peake PK, Rodriguez M. Regulating the interpersonal self: strategic self-regulation for coping with rejection sensitivity. *Journal of Personality and Social Psychology, 79,* 776–792.

Balcetis, E. & Cole, S. (2009). Body in Mind: The Role of Embodied Cognition in Self-Regulation. *Social and Personality Psychology Compass, 3,* 759–774.

Baumeister, R. F., Vohs, K. D., & Tice, D. M. (2007). The Strength Model of Self-Control. *Current Directions in Psychological Science, 16,* 351–355.

Baumeister, R. F., Tice, D. M., & Vohs, K. D. (2018). The Strength Model of Self-Regulation: Conclusions From the Second Decade of Willpower Research. *Perspectives on Psychological Science, 13*(2), 141–145.

Boden, M. T., & Thompson, R. J. (2015) Facets of emotional awareness and associations with emotion regulation and depression. *Emotion, 15,* 399–410.

Brooks, H. L., Rushton, K., Lovell, K., Bee, P., Walker, L., Grant, L., & Rogers, A. (2018). The power of support from companion animals for people living with mental health problems: a systematic review and narrative synthesis of the evidence. *BMC Psychiatry, 18,* 1-12.

Burnette, J. L., O'Boyle, E. H., VanEpps, E. M., Pollack, J.M., & Finkel, E. J. (2013). Mind-sets matter: A meta-analytic review of implicit theories and self-regulation. *Psychological Bulletin, 139,* 655-701.

Carney, D. R., Cuddy, A. J. C., & Yap, A. J. (2010). Power Posing: Brief Nonverbal Displays Affect Neuroendocrine Levels and Risk Tolerance. *Psychological Science, 21,* 1363-1368.

Carney, D. R., Cuddy, A. J. C., & Yap, A. J. (2015). Review and Summary of Research on the Embodied Effects of Expansive (vs. Contractive) Nonverbal Displays. *Psychological Science, 26,* 657-663.

Casasanto, D., & Dijkstra, K. (2010). Motor Action and Emotional Memory. *Cognition, 115,* 179-185.

Connor, T. D. (2013). Self-control, willpower and the problem of diminished motivation. *Philosophical Studies, 168,* 783-796.

Doris, J. (1998). Persons, Situations, and Virtue Ethics. *Noûs, 32,* 504-530.

Duckworth, A. (2016). *Grit: Why Passion and Resilience are the Secrets to Success.* New York: Scribner/Simon & Schuster.

Duckworth, A. L., & Seligman, M. E. P. (2005). Self-Discipline Outdoes IQ in Predicting Academic Performance of Adolescents. *Psychological Science, 16,* 939–944

Duckworth, A. L., & Quinn, P. D. (2009). Development and Validation of the Short Grit Scale (Grit- S). *Journal of Personality Assessment, 91,* 166-174.

Dweck. C. (2017). *Mindset: Changing the Way You Think to Fulfill Your Potential.* London: Little, Brown Book Group.

Elliot, A. J. (2015). Color and psychological functioning: a review of theoretical and empirical

work. *Frontiers in Psychology, 6,* 1-8.

Fujita, K. (2011). On Conceptualizing Self-Control as More Than the Effortful Inhibition of Impulses. *Personality and Social Psychology Review, 15,* 352-366.

Fujita, K., Carnevale, J. J., & Trope, Y. (2018). Understanding Self-Control as a Whole vs. Part Dynamic. *Neuroethics, 11,* 283–296.

Gamble, K. R., Howard, J. H., & Howard, D. V. (2014). Not Just Scenery: Viewing Nature Pictures Improves Executive Attention in Older Adults. *Experimental Aging Research, 40,* 513-530.

Hackman, D. A., Farah, M. J., & Meany, M. J. (2010). Socioeconomic status and the brain: mechanistic insights from human and animal research. *National Review of Neuroscience, 11,* 651–659.

Henden, E. (2008). What is self-control? *Philosophical Psychology, 21,* 69–90.

Hofmann, W., Luhmann, M., Fisher, R. R., Vohs, K. D., & Baumeister, R. F. (2014) Yes, but are they happy? Effects of trait self-control on affective well-being and life satisfaction. *Journal of Personality, 82,* 265–277.

Holt-Lunstad, J., Birmingham, W., Jones, B.Q., (2008). Is There Something Unique about Marriage? The Relative Impact of Marital Status, Relationship Quality, and Network Social Support on Ambulatory Blood Pressure and Mental Health. *Annals of Behavioral Medicine, 35,* 239–244.

Holton, R. (2003). How is Strength of Will Possible? In S. Stroud & C. Tappolet (Eds.), *Weakness of Will and Practical Irrationality* (pp. 39-67). New York: Oxford University Press.

Hung, I., & Labroo, A. (2011). From Firm Muscles to Firm Willpower: Understanding the Role of Embodied Cognition in Self-Regulation. *Journal of Consumer Research, 37,* 1046 - 1064.

Kennett, J., & Smith, M. (1996) Frog and Toad lose control. *Analysis, 56,* 63-73.

Leach, C. W., & Cidam, A. (2015). When is shame linked to constructive approach orientation? A meta-analysis. *Journal of Personality and Social Psychology, 109,* 983–1002.

Lewis, M. (2011). The Self-Conscious Emotions. *Encyclopedia on Early Childhood Developement.* http://www.child-encyclopedia.com/sites/default/files/textes-experts/en/638/the-self-conscious-emotions.pdf

Liu, X., Wang, L., & Liao, J. (2016). Enabling Delay of Gratification Behavior in Those Not So Predisposed: The Moderating Role of Social Support. *Frontiers in Psychology, 7,* 1-12.

McMains, S., & Kastner, S. (2011). Interactions of top-down and bottom-up mechanisms in human visual cortex. *Journal of Neuroscience, 31,* 587-597.

Mele, A. R. (1992). Akrasia, Self-Control, and Second-Order Desires. *Noûs, 26,* 281-302.

Mele, A. R. (2012). Backsliding: *Understanding Weakness of Will.* New York: Oxford University Press.

Michaelson, L., de la Vega, A., Chatham, C. H., & Munakata, Y. (2013). Delaying gratification depends on social trust. Frontiers in Psychology, 4, 1-7.

Milyavskaya, M., & Inzlicht, M. (2017). What's So Great About Self-Control? Examining the Importance of Effortful Self-Control and Temptation in Predicting Real-Life Depletion and Goal Attainment. *Social Psychological and Personality Science, 8,* 603-611.

Mischel, W. (2014). *The Marshmallow Test: Understanding Self-Control and How to Master It.* London: Transworld Publishers.

Mischel, W., Shoda, Y., & Peake, P. K. (1998) The nature of adolescent competencies predicted by preschool delay of gratification. *Journal of Personality and Social Psychology, 54,* 687−696.

Mischel, W., Shoda, Y., & Rodriguez, M. I. (1989) Delay of gratification in children. *Science,* 244, 933−938.

Moffitt., T. E. , Arseneault, L., & Belsky, D. (2011). A gradient of childhood self-control predicts health, wealth, and public safety. Proc Natl Acad Sci U S A, 108, 2693–2698.

Newman, K. P., & Brucks, M. (2016). When are natural and urban environments restorative? The impact of environmental compatibility on self-control restoration. *Journal of Consumer Psychology, 26,* 1-7.

Patrick, V. M., Chun, H. H., & Macinnis, D. J. (2009). Affective forecasting and self-control: Why anticipating pride wins over anticipating shame in a self-regulation context. *Journal of Consumer Psychology, 19,* 537-545

Philippot, P. & Blairy, S. (2010). Respiratory feedback in the generation of emotion. *Cognition and Emotion, 5,* 605-627.

Ryan, R. M. & Deci, E. L. (2000). Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being. *American Psychologist, 55,* 68-78.

Schlam, T. R., Wilson, N. L., Shoda, Y., Mischel, W., & Ayduk, O. (2013) Preschoolers' delay of gratification predicts their body mass 30 years later. *Journal of Pediatrics,* 162, 90−93.

Soussigan, R. (2002). Duchenne Smile, Emotional Experience, and Autonomic Reactivity: A Test of the Facial Feedback Hypothesis. *Emotion, 2,* 52-74.

Sownndhararajan, K., & Kim, S. (2016). Influence of Fragrances on Human Psychophysiological Activity: With Special Reference to Human Electroencephalographic Response. *Science Pharmaceutica, 84,* 724-751.

Sripada, C. S. (2014). How is Willpower Possible? The Puzzle of Synchronic Self-Control and the Divided Mind. *Noûs, 48,* 41-74.

Strang, S., Hoeber, C., Uhl, O., Koletzko, B., Münte, T. F., Lehnert, H., Dolan, R. J., Schmid, S. M., & Park, S. Q. (2017). Impact of nutrition on social decision making. *PNAS, 114,* 6510-6514.

Tracy, J. (2016). *Pride: The Secret of Success.* New York: Houghton Mifflin Harcourt.

Tuk, M. A., Trampe, D., & Warlop, L. (2011). Inhibitory Spillover: Increased Urination Urgency Facilitates Impulse Control in Unrelated Domains. *Psychological Science, 22,* 627-633.

Vandellen, M., Knowles, M. L., Krusemark, E., Sabet, R. F., Campbell, W. K., McDowell, J. E., & Clementz, B. A. (2012). Trait Self-esteem Moderates Decreases in Self-Control Following Rejection: An Information-processing Account. *European Journal of Personality, 26,* 123-132.

Walter, S. (2014). Situated Cognition: A Field Guide to Some Open Conceptual and Ontological Issues. *Review of Philosophy and Psychology, 5,* 241-263.

Weir, K. (2012). *What You Need to Know About Willpower: The Psychological Science of Self-Control.* Retrieved from www.apa.org/helpcenter/willpower.pdf.

Xu, X., Demos, K. E., Leahey, T. M., Hart, C. N., Trautvetter, J., & Coward, P., (2014) Failure to Replicate Depletion of Self-Control. *PLoS ONE, 9,* 1-5.

Zhao, D., Corsetti, M., Moeini-Jazani, M., Weltens, N., Tuk, M., Jan, T., Warlop, L, & Van

Oudenhove, L. (2019). Defecatory urge increases cognitive control and intertemporal patience in healthy volunteers. *Neurogastroenterology & Motility, 31.*

Breaking Beyond the Borders of the Brain:
Why We Need A Situated Account of Self-Control

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Abstract

The ability to control one's own behavior is crucial for any goal-achiever, but how is it possible to be self-controlled in the face of motivational obstacles? The vast majority defer full responsibility to the brain as the source of this control, while few argue that situational factors (e.g. bodily states, environmental cues, and social interactions) also play a critical role. To propose that self-control is a situated phenomenon is to go against the traditional paradigm of assuming that successful self-control is a capacity exercised by the brain alone.

The goal of this paper is to motivate the aforementioned paradigm shift by arguing that a *situated* perspective on self-control, where the body, environment, and/or society play genuinely causal roles in producing successful self-control, is superior to an *intracranialist* perspective, where the brain alone is responsible for successful self-control. In order to do so, I will argue that the intracranialist perspective is *not very useful*, since the types of self-controlling strategies that can be prescribed from this perspective are quite ineffective and inefficient for those who need these strategies the most (i.e. those suffering from impulse control disorders or chronic apathy). I will then argue that the intracranialist perspective is *not very accurate*, since there are several empirical examples where an agent is either having the relevant thoughts or behaving in the appropriate ways, but the physical state of the body, some environmental cue, or some social factor play the vital role of producing those thoughts or behaviors. I conclude by pointing out the virtues of a situated account in light of the problems raised for intracranialism to drive home the claim that future research in self-control really must break beyond the borders of the brain.

1. Introduction

The ability to control one's own behavior is crucial for any goal-achiever, but how is it possible to be self-controlled in the face of motivational obstacles? The vast majority defer full responsibility to the brain as the source of this control, while few argue that situational factors (e.g. bodily states, environmental cues, and social interactions) also play a critical role.

Situated cognition is an umbrella concept which denotes any view that the mind is not constricted to the borders of the brain, but also involves some external factors (e.g. the body, environment, and/or society) as either a *cause* or a *constituent* of cognition (Clark & Chalmers, 1998; Walter, 2014). The term situated is used very broadly, and comes in many different flavors. Situated cognition includes any theories relating to the mind that can be called *embodied* (i.e. emphasis either the causal or constituent relation between cognition and the body), *embedded* (i.e. emphasis on the causal relation between cognition and the environment), *extended* (i.e. emphasis on the constituent relation between cognition and the environment), *enacted* (i.e. emphasis on sense-making through interactions between the body, environment, and society), or *distributed* (i.e. emphasis on the relation between cognition and social networks) (Walter, 2014). Situated cognition is a concept directly opposing that of intracranialism, or the view that the brain alone is responsible for cognition, which has been the dominant assumption within the cognitive sciences.

Some have applied the concept of situated cognition to specific debates about mental phenomenon, affectivity being the most popular. Stephan et al. (2014), for example, ask whether "the brain alone can do some emoting?". One can probably pose this question for every distinct mental phenomenon that exists, and some have asked whether the brain alone can do some *self-controlling*? In giving a positive response, a handful of situated theories of self-control have emerged (e.g. Heath & Anderson, 2010; Hung & Labroo, 2011; Vierkant, 2014).

Self-control, generally defined, is the ability to regulate one's own thoughts, emotions, and behaviors. Few would deny that self-control is a *mental* ability, and pretty much every self-control theorist concerns themselves with thoroughly understanding everything that happens within the brain when people are successfully self-controlled, and what goes wrong in the brain when people end up being weak willed. Suggesting that self-control is a situated phenomenon, and that the body, the environment, and/or the society play just as vital of a role in successful self-control as the brain, is to imply an entire paradigm shift within a body of literature that dates back to the time of Socrates![4] Why do we need to extend the concept of self-control beyond the limits of the brain when we have only talked about successful self-control within the scope of the brain for thousands of years?

The goal of this paper is to motivate the aforementioned paradigm shift by arguing that a *situated* perspective on self-control, where the body, environment, and/or society play genuinely causal roles in producing successful self-control, is superior to an *intracranialist* perspective, where the brain alone is responsible for successful self-control. In order to do so, I will first

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[4] Socrates argued that to know the good is enough to be able to do the good, so his suggestion for successful self-control (i.e. getting yourself to do the good) is simply to change mental states (i.e. teach yourself the good).

define self-control in section 2, as well as introduce some related concepts that will reappear throughout the paper. Then, in section 3, I will tease apart some of the assumptions underlying self-control theories and explain how intracranialism emerges, while also giving a brief overview of three prominent views that assume some version of intracranialism. In section 4, I will argue that the intracranialist perspective is not very *useful*, since the types of self-controlling strategies that can be prescribed from this perspective are quite ineffective and inefficient for those who need these strategies the most (i.e. those suffering from impulse control disorders or chronic apathy). In section 5, I will argue that the intracranialist perspective is not very *accurate*, since there are several empirical examples where an agent is either having the relevant thoughts or behaving in the appropriate ways, but the physical state of the body, some environmental cue, or some social factor plays the crucial role of producing those thoughts or behaviors. Lastly, in section 6, I conclude by pointing out the virtues of a situated account in light of the problems raised for intracranialism to drive home the claim that future research in self-control really must break beyond the borders of the brain.

2. The Phenomenon of Self-Control

The self-control literature is very large and has an extensive history, with many interdisciplinary contributions. Naturally, the different disciplines that focus on self-control have their own definitions of this ability. Psychologists tend to give the general definition of the ability to regulate one's own thoughts, emotions, and behaviors. Philosophers usually define self-control in terms of sticking to one's better judgments, even when opposition is present. These two definitions conceptually overlap, despite using different terms.[5] Moreover, opposition to self-control - whether in the form of temptation, diminished motivation, or procrastination - is discussed interchangeably and in varied contexts. Due to all this variation, it is important to clarify the main concepts associated with self-control in order to smoothly navigate through the different views and debates concerning this broadly examined ability.

In this section, I will explain three concepts that will be liberally used throughout the remainder of this paper. First, I will clarify what I will mean when I refer to one's better judgment or goal. Next, I will make an important distinction between two types of self-control and explain why I choose to primarily discuss one over the other. Then, I will highlight the three forms of motivational opposition mentioned throughout the literature, and the basic ontologies from which they derive, to clarify what I mean when I reference motivational opposition.

2.1 Better judgments and goals

The concept of a better judgment has ushered in its own debate, with philosophers arguing over what constitutes a better judgment and how agents can come to form better judgments. For the purposes of this paper, the definition of a better judgment is more-or-less the

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[5] Speaking of terms, I use self-control interchangeably with self-regulation and willpower. I use the term weakness of will to refer to the opposite of successful self-control.

same as the definition of a goal: a sincere all-things-considered decision about what is best for the agent to do, based on her genuine ambitions and desires. If, for example, a situation is under discussion where an agent holds a better judgment that she ought to be on a diet, the argument will assume that this agent sincerely and wholeheartedly endorses being on a diet. The purpose of this assumption is to exclude examples where the agent might only loosely endorse her better judgment, such as in cases of second-order desires (e.g. cigarette smokers who want to want to quit, given the health risks, but don't actually want to quit smoking because they find it absolutely pleasurable in every other sense).

2.2 Two types of self-control

Another important element at work within the (philosophical) definition of self-control is the potential presence of motivational opposition. Motivation, generally defined, is the salience or "pull" of reasons that an agent has for performing some action. Motivational opposition occurs when an agent has some reason(s) for acting contrary to her better judgment or goal, including having reasons to refrain from acting all together (e.g. in cases of people with extreme depression, which leaves them lethargically immobilized in bed). The reason(s) must be in support of an action that is ultimately worse than the one entailed within the agent's better judgment or goal for there to be motivational opposition. The salience of the recalcitrant reason(s) must be to an equal degree or greater than the salience of the reason(s) for the better judgment or goal in order to set the stage for self-control. Otherwise, if the recalcitrant reason(s) are only minimally salient, then the self-controlled agent is simply acting on the strongest motivation, which is considered a different type of self-control than the kind that most people are concerned with and seek to master. Whether an agent acts on her better judgment *before* there are any salient reasons to act in a contrary way or *while* she perceives very salient reasons to act in a contrary way is the point of distinction between two types of self-control: diachronic and synchronic, respectively.

One of the paradigm examples of diachronic self-control is the dieter who throws away all the junk food before the temptation to break her diet even has a chance to strike. However, if the dieter is already experiencing an intense craving for the junk food – mesmerized by the thought of indulging in the delicious snacks and making excuses for why she should treat herself this one time – but somehow manages to get rid of all the junk food anyway, then this would be an example of synchronic self-control.

Synchronic self-control captures the majority of philosophical attention because of the intriguing puzzle that this concept entails: when an agent is successfully self-controlled while having very strong reasons to act in a contrary way, she has performed an action that she was less motivated to do.[6] Presuming that it is a law of motivation that we do what we are most motivated to do, all instances of successful self-control appear to be incompatible with this basic assumption. This inconsistency has led some to deny that synchronic self-control is possible, while others try to resolve the incompatibility between the concept of synchronic self-control and

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[6] Or, if the reasons to act contrary to her better judgment were equally salient as her reasons to act according to her better judgment, then the agent would theoretically be at a motivational standstill, resulting in inactivity.

basic assumptions about how motivation functions. Since the theories discussed in this paper are primarily concerned with synchronic self-control, all further mentions of "self-control" will refer to the synchronic type.

2.3 Motivational oppositions

The last thing to note is that the self-control literature references at least three different types of motivational opposition interchangeably: temptation, diminished motivation, and procrastination. Temptation cases are the most frequently discussed type of motivational opposition. Temptation occurs when an agent who holds a better judgment experiences a stronger motivation to pursue something that is contrary to that better judgment. Prototypical examples of temptation include chocolate cake for dieters, parties for college students, cigarettes for health concerned individuals, and attractive coworkers for those who have taken the fidelity oaths of marriage.

Diminished motivation cases, on the other hand, involve agents who hold some better judgment, yet lack the desire to do anything, including acting on their better judgments (Connor, 2014). In this sense, the motivational opposition is the lack of resources (e.g. desire, energy, motivation, etc.) to follow through with what the agent judges is best to do. Examples of agents with diminished motivation include people suffering from depression, apathetic individuals, or those that are just plain lazy.

Procrastination cases are recognized as a distinct type of motivational opposition, but for the purpose of this paper, it is unnecessary to distinguish procrastination cases from the other two types of opposition. It suffices to say that when an agent procrastinates, she delays acting according to her better judgment, and that this delaying can result from one of two sources: (1) the agent is *more motivated* to do something else, or (2) the agent simply *lacks the motivation* to perform this action. For example, a college student who is procrastinating on a term paper could be doing so because she is *tempted to do something else*, like watch the new movie that just came out, beat the next level in a video game, attend a party with all her friends, etc. Alternatively, the college student could be procrastinating on writing her term paper because she has no interest in the term paper and *cannot muster the motivation* to start working on it until the pressure of the deadline kicks in.

It is not the goal of this paper to provide a detailed taxonomy of the different types of motivational oppositions. Rather, the important point is that motivational opposition can involve either *competing motivation* to a better judgment, or simply the *lack of motivation* to stick to the better judgment. Different self-control strategies are prescribed to deal with the different types of motivational opposition, depending on whether the intended result is to attenuate competing motivation or to boost one's own motivation.

2.4 From a general definition to a specific theory

To sum up, self-control is the ability to stick to one's sincere all-things-considered better judgment (i.e. one's goal) when one is either tempted to do otherwise, or simply lacks the motivation to go through with the judgment. Despite the clarifications to the traditional

definition, at least one important question remains: *how* does one exercise this ability? Most theories of self-control arise in light of attempting to answer this question. Such theories are often two-fold: they aim to *describe* exactly what consists in the ability to be self-controlled, and, at the same time, *prescribe* strategies that help one stick to one's better judgments. In giving a more precise description of self-control and explaining how one can be self-controlled in the face of opposition, the majority of theories accept certain assumptions regarding self-control that eventually create problems for these views. In the following section, I will explain a particularly persistent assumption within the self-control literature: intracranialism, or the idea that the brain alone is responsible for successful self-control.

3. Intracranialist Self-Control

Intracranialism denotes any view that restricts some cognitive capacity to the confines of the cranium. Intracranialism stands in contrast to situated cognition, which is the idea that cognitive processes are either caused or constituted by some extra-cranial factors such as the body, the environment and/or society.

An overwhelming majority of the self-control literature assumes some degree of intracranialism, focusing almost exclusively on the brain while treating extra-cranial factors as mere *influences*. These views admit that extra-cranial factors can have an impact on self-control, but the role that these factors play in producing successful self-control is contributory at best (and usually thought of as a matter of luck), but certainly not necessary. In fact, most people intuitively think of extra-cranial factors as negative influences, increasing the likelihood of weakness of will rather than strengthening self-control.

The intracranialism that underlies such views starts with the observation that perceptions - or, more specifically, the types of relevant thought patterns that go through an agent's mind when faced with some motivational opposition - are incredibly important for successful self-control. Assuming that only the brain can create these relevant thought patterns, self-control is treated as an exclusively brain-based ability.

In this section, I will present empirical evidence for the claim that certain mind states can make or break successful self-control. Then, I will introduce three prominent views of self-control, those defended by Walter Mischel (2015), Alfred Mele (1992), and Jeannette Kennett and Michael Smith (1996). I will explain how all three views implicitly assume that only the brain is capable of producing successful self-control.

3.1 Thoughts Matter

The types of thoughts that an agent thinks during a self-control dilemma plays a major role in producing behavior. These thoughts typically arise from the implicit beliefs that the agent holds. For self-control, the thoughts that are relevant are ones that reaffirm certain implicit beliefs regarding the self.

The Self-Determination Theory (Ryan & Deci, 2000) is based on the observation that two vital implicit beliefs regarding the self that matter for motivation are an agent believing that she is autonomous, and an agent believing that she is competent. To be able to control her own

behavior, an agent has to believe that she has the freedom to do so, and believe that her actions will produce the intended result, or else she has no reason to perform those actions. According to the Self-Determination Theory, these two beliefs produce intrinsic self-motivation. Since self-control and self-motivation are strongly interrelated, implicit beliefs regarding one's own autonomy and competence ought to matter highly for self-control.

Similarly, belief that "human attributes are malleable rather than fixed" was a reliable predictor of three processes that comprise self-control: goal setting, goal operating, and goal monitoring (Burnette et al., 2013). This connection between an agent believing that her attributes can be enhanced with practice (or could get worse with lack thereof) and the same agent pursuing her goals makes sense if we consider the fact that goals are typically focused on changing some state of affairs (e.g. to get healthier, to be more productive, to retire by age 60, to earn a million dollars, etc.). For an agent to be motivated to produce a change in some state of affairs, she has to believe that her attributes are capable of making the corresponding changes. A person with the goal to become physical fit, for example, has to believe that she can develop the attributes of a physically fit person, such as knowledge about the human body and nutrition, or trained discipline and consistency.

Another state of mind relevant for self-control is having positive self-esteem. One of the benefits of trait self-esteem is that it moderates the diminishing of self-control that typically occurs after social rejection (Vandellen et al., 2012). One of the major downfalls of having *low* self-esteem is the reduced grey matter volume in brain areas - which tends to negatively impact the abilities to which the brain area contributes - associated with emotion regulation, stress regulation, and pride (Agroskin et al., 2014). Authentic pride is another state, this time emotional, which has been linked to self-control and goal-achievement (Tracy, 2017). Overall, a positive evaluation of oneself (with short-term deviations aside) seems to matter for successfully controlling one's own behavior.

Being a gritty individual also matters for successful self-control, especially when it comes to having to wait a particularly extended period before receiving a reward or enduring some unpleasant thing for long durations of time. Having grit refers to a combination of having passion for what one is doing and having the capacity to perseverance for long periods of time, which is a better predictor of achievement in the face of great challenges than sheer talent or skill (Duckworth & Quinn, 2009). Developing a gritty state of mind will work to reinforce self-control in the face of temptation or diminished motivation, allowing the agent to persevere in pursuing her goals.

It is quite clear from these studies that certain thoughts matter for self-control. More specifically, it appears as though an agent being in control of her own behavior entails that she is thinking the relevant thoughts (i.e. affirming that she is autonomous, competent, gritty, able to grow and develop, and has high self-esteem, as well as pride in her own achievements). It is difficult, if not impossible, to deny that thoughts matter for self-control, although what causes these relevant self-controlling thoughts is still a mystery. The majority of self-control theorists make the same assumption: it is the brain alone that causes the relevant thoughts that matter for successful self-control.

3.2 Intracranialism and Prominent Views

There are certain mental states, as demonstrated empirically, that can make or break self-control. Based on the fact that (relevant) thoughts matter, most self-control theories draw the conclusion that the brain alone is responsible for self-control, since the brain alone is presumably responsible for bringing about these relevant thoughts. It appears that the argument that the majority of the self-control literature implicitly endorse is as follows:

> P1) If agent A is in control of her behavior, then A is having the
> relevant thoughts.
> P2) If agent A is having the relevant thoughts, then A's brain alone
> is responsible.
> Therefore,
> C) If agent A is in control of her behavior, then A's brain alone is
> responsible.

We can call the conclusion of this argument the Intracranialist Principle of Self-Control, since the claim restricts self-control to the boundaries of the brain. Correspondingly, P2 can be called the intracranialist assumption (IA), as it is the assumption that the brain is the only possible cause of the relevant thoughts that lead to successful self-control.

While an exhaustive list of all the theories of self-control is impossible to present in this paper, it should suffice to offer a few examples of prominent views in order to show the pervasiveness of intracranialism in the traditional literature. Each of the three views discussed in the following subsections recognizes that certain thoughts matter for self-control and, at the same time, clearly endorses the Intracranialist Principle of Self-Control, as evident by the fact that all three theories restrict their scope of inquiry to brain-based strategies. If these theories accept the truth of both P1 and the Intracranialist Principle of Self-Control, then they must also accept the truth of IA.

3.2.1 Mischel's executively functioning marshmallow kids

Walter Mischel (2015) is a psychologist who is most famous for his "marshmallow test", which was designed to measure the ability of children to delay their gratification (i.e. to wait for a greater but later reward instead of indulging in a smaller but sooner reward). The original test was set up in the following way: a child receives a tasty treat (i.e. a marshmallow, a cookie, or a pretzel) and is told that she can eat the treat now, or wait to eat the treat until the experimenter returns, at which point the child will get two treats. The experimenter then leaves the room and the successfully self-controlled children were those who could wait for the second treat.

According to Mischel, the marshmallow experiments reveal that the perception of how arousing something is will directly affect the motivation to pursue that thing, so the rule-of-thumb for successful self-control is to "cool the 'now' and heat the 'later'" (2015; 256). If, for example, a dieter stumbles upon a box of cookies, she needs to focus on the dull and boring parts of the cookie, like its shape or fat content, rather than on the arousing and vivid features of the

cookie, like its deliciously sugary taste or the melting warm chunks of yummy chocolate chips. Or, if the agent is, for example, a college student experiencing diminished motivation for completing a term paper, she can give herself a motivational boost by vividly imagining the arousing features of how good it will feel to have the finished term paper in her hands, the relaxation and fun to come afterwards, and the praise from her teacher and parents for having completed the assignment. The way in which an agent can change her perception, Mischel directly points out, is through exercise of executive cognitive functions such as refocusing of attention, reappraisal, forming implementation intentions, etc (2015; 106-111; 235-240).

Mischel's experiments just further reinforce the claim that certain thoughts matter for self-control. Mischel also clearly endorses the Intracranialist Principle of Self-Control, given that the strategies prescribed for changing the relevant perceptions are traditional brain-based strategies. Interestingly, Mischel spends a great deal of his book discussing external factors, such as environment, genetics, parental influence, etc. However, it would be a mistake to think that this is evidence against his explicit endorsement of the Intracranialist Principle of Self-Control, because he states that

> the purely deterministic scientific views of the past century…
> attributed the causes of our behavior to the environment, DNA, the
> unconscious, bad parenting, or evolution, plus chance. The story
> this book tells acknowledges all these sources as influences. But
> ultimately, at the end of that causal chain, it is the individual who
> is the agent of the action and decides when to ring the bell. (2015,
> 278)

It is evident from this passage that Mischel explicitly endorses the assumption that the concept of self-control entails being contained to the boundaries of the brain.

3.2.2 Mele's belief and desire sets

Alfred Mele (1992) argues that self-control essentially consists in refocusing one's own attention to alternative actions that still achieve one's ultimate goal, but are not contrary to the motivational opposition. To illustrate this point, Mele uses the example of Ian, who has to paint the shed but finds himself comfortably nestled on the couch. The desire to sit on the couch and the desire to paint the shed are incompatible, and the desire for the former is stronger than the desire for the latter. However, Mele points out, Ian's desire to be a self-controlled agent in general is compatible with the desire to remain on the couch – both can technically be satisfied simultaneously. Thus, all that Ian needs to do to motivate himself to paint the shed is essentially to refocus his attention to from the goal of painting the shed, to the goal of being a self-controlled individual, the latter of which is not (technically) motivationally opposed by the desire to remain on the couch. Desires, in short, play a role in both weakness of will and self-control, and emotions more generally play a large role in Mele's theory of successful self-regulation (Mele, 2012).

Carving out room for emotions to play a causal role in self-control could indicate that Mele is not actually an intracranialist, since emotions are known to be highly embodied

phenomenon. However, for Mele, emotions contribute to self-control in the form of shaping the relevant self-controlling cognitive states, given that self-control is ultimately about focusing on the right desire and belief set. The shifting of attention is the crucial strategy prescribed by Mele, so the only relevant feature of an emotion in this context is an emotion's capacity to captivate and hold attention. There is no room for the body to play a causal role in Mele's framework, so alluding to emotions as having the capacity to produce successful self-control does not place Mele within the situational camp.

Again, it appears that there is the assumption that the relevant thoughts - in this case, the belief and desire set that the agent's attention is focused on - entails that the brain alone is responsible.

3.2.3 Kennett and Smith's unmotivated self-controlling thoughts

Jeanette Kennett and Michael Smith (1996) explicitly deny that executive functions can achieve successful self-control, and instead prescribe to train one's disposition to reflexively react in appropriate ways when motivational opposition is present. Successful self-control, according to Kennett and Smith, cannot be an intentional action, since an agent who is experiencing motivational opposition does not have sufficient motivation to act on her better judgment or to motivate any other actions that aim at achieving the better judgment.[7] Instead, any instance of successful self-control is more akin to a happening than an action, since that instance cannot be motivated in the proper sense of the term.

Kennett and Smith point out that "the having of thoughts need not be *a causal consequence* of a *desire* to achieve something and a *belief* that that can be achieved by having those very thoughts" (1996; 68-69 my emphasis). On Smith and Kennett's view, the agent does not need to be intentionally engaged in an instance of self-control – all that matters is that the agent has the right sort of disposition where the right self-controlling thoughts reflexively enter her mind when she encounters some motivational opposition. For example, thoughts of herself as being grossly fat can reflexively enter the mind of the dieter who comes across a box of cookies because she has acquired the disposition to pay attention to the nutritional value of food in her quest to lose weight. This thought has the power to invoke feelings of disgust, which will direct the dieter's attention away from the cookies. More importantly, this reflexive thought is the dieter's only hope of being successfully self-controlled, since she cannot possibly both be motivated to eat the cookies and motivate herself to avoid the cookies – these two courses of action are logically incompatible.

For Kennett and Smith, there is no question that thoughts play a huge role in producing successful self-control. They advocate non-actional self-control on the basis of recognizing that the brain alone is incapable of shifting attention when it is captivated by some temptation, thus Kennett and Smith also advocate that is is solely the brain that can produce successful self-control.

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[7] This is the crux of the puzzle of synchronic self-control – how can an agent do what she is less motivated to do? Kennett and Smith are arguing that there is no way around this puzzle, and that an agent is not capable of *doing* anything (in the sense were doing something is an intentionally motivated action) provided that there is an incompatible course of action that she is more motivated/tempted to take.

3.3 Shifting the paradigm

Overall, the tradition within the self-control literature certainly seems to be intracranialist. Assuming that successful self-control is produced solely by the brain may be the paradigm in the self-control literature, but, as is the case with many paradigms, eventually comes a time where the paradigm must shift.

This shift is necessary because of emerging evidence of how large an impact that an agent's body, her immediate environment, and the people around her have on the relevant thoughts that lead to successful self-control. More and more neuroscientific, psychological, and behavioral evidence is amounting to the idea that human beings do not have as much control over our actions as we would like to think. Discovering the significance of these "situational factors" leads some researchers and theorists to reject the existence of willpower altogether, arguing that diachronic is the only form of self-control that truly exists (Fujita, 2011; Milyavskaya & Inzlicht, 2017).[8]

Another way to interpret this evidence, however, is to say that the control that we *do* have over our actions is *not the type* of control that we *think* we have over our actions. In other words, instead of rejecting willpower, we can instead reject IA and, by extension, the Intracranialist Principle of Self-Control. Doing so will preserve self-control, albeit a situated version of this ability. In the following section, I will argue that one reason for rejecting IA is that this assumption renders self-control ineffective and inefficient for those who need it the most, namely, those with impulse control disorders or chronic apathy.

4. Is Intracranial Self-Control Useful?

One of the main reasons why people care about understanding self-control is the desire to design strategies, techniques, and systems to make people better at being self-controlled. Hence, it is very important that the way in which self-control is perceived allows for prescribing effective and efficient interventions, especially for situations involving motivational opposition.

Those who need self-control the most, that is, individuals who suffer from either some sort of impulse control disorder (i.e. motivational opposition in the form of competing motivation) or chronic apathy (i.e. motivational opposition in the form of lacking resources), are those who can be said to have "weak brains". In the context of the preceding discussions, a weak brain refers to structural or functional deficits that make certain brain-based capacities (e.g. attention deployment) difficult or impossible to exercise. IA, and any strategies that arise from this assumption, can't be effectively and efficiently applied to very weak brains because these brains are incapable of recruiting the relevant cognitive processes.

In this section, I will first present a reason to think of agents with impulse control disorder as having a weak brain by pointing out empirical evidence of "cognitive blindness", which refers to the lack of cognitive awareness for one's own drug seeking behavior. I will then present a reason to think of agents with chronic apathy issues as also having a weak brain by

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[8] This point is picked up again in the last section.

highlighting actual structural and functional differences that make the apathetic brain simultaneously low on motivational resources and require more of those resources than a normal brain. Lastly, I will join these two points and argue that IA-based strategies of self-control will be ineffective and inefficient for those who need it most, thus making such strategies not very useful.

4.1 Weak brains in temptation cases

A study conducted by Jennifer E. Murray and colleagues (2015) investigates the neural route that processes the habitual desire for cocaine in rats. The observations made within this study revealed that the desire for cocaine in the rats was processed through a neural pathway – namely, the basolateral amygdala[9] to the dorsolateral striatum[10] – which projects directly away from the cortex (2015; 2). One of the implications of this neural pathway processing habitual desires (e.g. for cocaine) is there is a lack of conscious awareness of the desire – given that little to no information is processed through cortical areas – and an agent who experiences a habitual desire for cocaine is likely to engage in cocaine-seeking behavior without even realizing what has happened. Furthermore, since the same neural reward system processes habitual desires of all sorts (e.g. drugs, food, sex, gambling, alcohol, video games, etc.), it is plausible that this "cognitive blindness" can happen to anyone who is battling some form of habitual temptation.[11]

Being unaware that she is engaging in some desire-seeking behavior that she wishes to avoid does not place an agent is a position to successfully deploy a brain-based strategy when she encounters the object of her temptation. If IA is true, then the addict's weak brain cannot be solely responsible for engaging in the right thoughts, and she correspondingly will not be able to think the right thoughts. For this reason, any intracranialist strategies of self-control are inefficient and ineffective for the drug addicts, chronic overeaters, heavy smokers, and hardcore video gamers, all of whom presumably process the triggers of their deeply ingrained bad habits subconsciously.

4.2 Weak brains in diminished motivation cases

There is no clear evidence that cognitive blindness occurs in case of chronic diminished motivation, but a different sort of problem arises for using IA-based strategies when one faces this form of motivational opposition. A study conducted by Valerie Bonelle and colleagues (2016) examines neural differences between normal individuals and apathetic individuals (i.e. those who experience chronic diminished motivation). The fMRI imaging reveals differences in

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[9] Associated with operant conditioning (i.e. habitual behaviors) and the fear response (i.e. avoidance of pain or injury)

[10] Associated with reward and motivation

[11] The idea that temptation blinds us underlies many personal accounts of addiction and is intuitively pervasive. Our folk psychology recognizes that "love is blind" and that "love makes people do stupid things", and love can certainly (at least in some cases) be considered an addiction. Other people are "blinded by rage", and drug addicts are blinded by the promise of catching the dragon

structural and functional connectivity of two brain regions – anterior midcingulate cortex[12] and the supplementary motor area[13] – which leads the authors to argue that "[i]mpaired information flow between these systems may therefore affect the efficiency of the control exerted by cingulate regions, resulting in difficulty in action initiation" (2016, 817). Due to this decrease in connectivity between the two regions, apathetic agents can have all the relevant self-controlling thoughts to create the proper intentions, but still fail to translate those thoughts into the corresponding actions. The potential source of this failure, as suggested by the authors, is the combination of observations that apathetic individuals exhibit more physical effort sensitivity, which is "associated with greater recruitment of regions previously associated with effort discounting", and "increased recruitment of neural resources at the response preparation level" – namely, intention forming (2016; 816). Increased or greater recruitment, in this context, refers to the amount of mental activity or effort exerted.

These observations collectively indicate that the cognitive processes needed to form the right intentions or thoughts are very costly (in terms of motivational resources) for the apathetic agent[14] and, since there are already limited resources available to such an agent, it appears that there just are not enough resources left to translate the costly intention into a corresponding action. In other words, for those who experience chronic diminished motivation, it is literally harder to act on their intentions, partly because all the motivational fuel is burnt up on forming the intention in the first place, but also because apathetic individuals need more motivational fuel (that they don't have) than normal agents to translate those intentions into action. In this sense, apathetic individuals - like the addicts - suffer from a weak brain, and intracranialist strategies, in virtue of placing all the burden of self-control on the brain, just simply don't apply well to these cases.

4.3 Is this problem really a problem? No, unless you need therapy

Taken together, this evidence suggests that the more liable an agent is to struggle with either form of motivational opposition – temptation or diminished motivation – the more likely she is to experience some cognitive deficit – cognitive blindness or the increased effort sensitivity, respectively.[15] It has been argued that intracranialist strategies of self-control are inefficient and ineffective for the agent who is experiencing some cognitive deficit, since either deficit significantly limits the possibility of the brain being responsible for one's own behavior. It should be noted that a proponent of intracranialist views could accept the claim that IA-based strategies are not so useful for the more extreme cases, but also point out that this claim alone is not enough to warrant a paradigm shift into situated views of self-control. It is obvious that more

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[12] Associated with intention forming

[13] Associated with motor preparation for executing an action

[14] This is the conclusion reached by Bonelle et al, who explicitly state that "Increased neural inefficiency with higher apathy traits could imply elevated "physiological costs" of action initiation, with a need to recruit more brain resource to perform at the same level as more motivated individuals"

[15] It is very likely that individuals who are struggling with chronic motivational opposition experience other cognitive deficits as well – these are just two examples that commonly occur.

extreme situations will be harder to overcome, such a proponent might say, and some situations might just be too hard for some to overcome at all.

This may be a valid point, but a point that paints an incredibly bleak picture for anyone who seeks professional help in overcoming some impulse control disorder. IA is the theoretical foundation of Cognitive Behavioral Therapy (CBT), which is the primary form of treatment in most rehabilitation clinics, adopted by many private psychotherapists as well, to treat impulse disorders and addictions, depression-based diminished motivation, behavioral apathy, anger management issues, post traumatic stress disorder, phobias, and other psychological disorders that produces maladaptive behavior. CBT typically takes several years of consistent sessions to produce positive results, and requires an agent to exercise relatively high degrees of effort for the entire duration of treatment. As argued in this section, the people who seek this type of treatment (i.e. those experiencing chronic motivational opposition) are the same people who either lack the access to the cognitive skills that CBT focuses on training, or can't afford to invest the effort required by this therapy. These reasons can explain why a patient undergoing CBT in a rehabilitation clinic has a 40-60% chance of relapse – the CBT road to success is too long, providing many opportunities for failure, and overwhelmingly demanding for one who is already weak willed. Despite the attempt by many rehabilitation clinics to advertise that "relapse is not failure"[16], relapse is likely to have the same demotivating effect as failure on one's desire to persevere, which is also already limited in those that are weak. It is hard to see how CBT can offer hope for anyone truly struggling to overcome some destructive and deeply ingrained habits.

There probably are still those who remain skeptical that the practical problem is enough to warrant abandoning IA. After all, just because some assumption leads to prescriptive failure in extreme cases, or does not apply to some particular demographic, no matter how large, does not necessarily mean that the assumption itself is wrong. In the following section, I will present evidence which suggests that IA is indeed false.

5. Is Intracranial Self-Control Accurate?

The assumption that underlies the Intracranialist Principle of Self-Control is the implicit belief that having relevant self-controlling thoughts entails that only the brain is responsible for these thoughts arising. In the previous section, I argued that this assumption provides very limited interventions and therapy designs for people who need help being more self-controlled. The bigger question, however, is whether this assumption is true. If it turns out that the brain is *not* solely responsible for self-control, then the scope of investigation within the self-control literature needs to be expanded to include whatever else is responsible as well.

In this section, I will argue that there is evidence which supports the claim that an agent's body, environment, and/or society play a crucial causal role in producing successful self-control. The studies discussed act as counterexamples to IA by showing instances where an agent has the relevant self-controlling thoughts, often demonstrated by the agent having behaved in the appropriate ways, but some extra-cranial factor - and not the brain - was the variable being

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[16] This seems to be an almost universal claim amongst rehabilitation clinics. A few examples include the American Addiction Centers, the National Institute of Drug Abuse, and the Partnership for Drug-Free Kids.

manipulated. Despite many of the examples discussed offering *indirect* evidence, the culmination of such examples strongly points to the inaccuracy of intracranialism, while also highlighting a virtually untapped source of research questions for empirical and philosophical investigation.

5.1 The body

An agent's physical body maintains a very intimate relationship with her mind.[17] For this reason, an agent's body is arguably the most reliable extra-cranial factor that can be manipulated to produce corresponding changes in her mind. There are many empirical examples where participants of a study were having the relevant self-controlling thoughts, as indicated by their appropriate behavior, yet the agent's body was the independent variable.

Possibly the most direct evidence for changes in the body affecting self-control is the set of experiments which show that muscle tension (i.e. either clenched fist or tightened calf muscle) significantly increases self-control in a variety of domains (Hung & Labroo, 2011). Participants who were clenching their muscles were able to attend to unwanted stimuli better, drank significantly more of a vinegar-based "health drink", withstood physical pain for longer, and made healthier snack choices than the relaxed controls. The authors of the study propose that this evidence supports the idea of embodied self-regulation, since a physical tweak reliably improves this ability.

Another experiment directly looking at the body's role in impulse control found that the need to urinate increases impulse control (Tuk et al., 2011). A follow-up study showed an association with the (moderate) need to defecate and increases in cognitive control, as well as inter temporal patience (Zhao et al., 2019). The need to expel waste isn't the only internal process that has a large impact on self-control - what the body intakes also matters. Eating a breakfast that is relatively balanced in carbohydrates and protein, for example, as opposed to having a high carbohydrates/low protein ration, decreases the likelihood of punishing behavior for minor social transgressions (Strang et al., 2017). Such studies reveal that diets don't just matter for general positivity or general energy, but that specific macro and micro nutrients that are ingested can have incredibly specific and nuanced effects on mind states.

Movement also appears to be an incredibly important factor for self-control. One study on adolescents found a link between complex coordination skills and academic achievement (Fernandes et al., 2016). In fact, motor coordination was the best predictor of academic achievement amongst the different factors assessed in the study. It is currently unknown why complex motor coordination is such a reliable predictor of academic achievement, but there seems to be something about coordinated movement that cultivates an achievement mindset. A separate study on the effects of chewing gum observed that students who were asked to regularly chew gum for two weeks got more of their academic work done than students who were asked to refrain from chewing gum for that time (Smith & Woods, 2012). The jaw movement likely works to relieve feelings of stress and anxiety, so chewing probably also facilitates focus on the task at

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[17] This claim is true for healthy, normal individuals. There are certain individuals who suffer from either physical and/or mental disorders that directly affect this relationship. Phantom limb syndrome, for example, marks a disturbed relationship between an agent's body and mind because this disorder occurs when an agent's amputated limb still creates sensations that the mind perceives.

hand. Correspondingly, sedentary behavior has been linked with increased levels of stress, anxiety, and depression (Lee & Kim, 2017). It appears as though specific types of movement contributes to creating the relevant mental states for self-control, whereas the lack of movement (i.e. sedentary behavior) produces the mental states that facilitate weakness of will. The important point is that in both cases, the movement or the lack thereof were effective causes of achievement or diminished motivation, respectively, and not the brain alone.

All these examples point to the body playing a highly significant role in the production of successful self-control. Following this line of reasoning, certain bodily deficits will likely result in the increased likelihood of weakness of will. It is not controversial to point out that bad diets and lack of physical health and fitness due to sedentary lifestyles have negative impact on cognition in general, so it also shouldn't be too crazy to propose that certain physical states are directly correlated with specific types of thoughts that an agent thinks.

5.2 The environment

The effects of an agent's immediate material environment on the mind states relevant for successful self-control is a relationship much less studied. Unfortunately, there just isn't as much empirical data supporting this claim, but only because this precise relationship has not been under much investigation. Instead, environmental factors have been primarily studied in regard to their effect on emotional states. There are certain studies that reveal an agent presumably thinking the relevant self-controlling thoughts, but some environmental factor participates in regulating those thoughts.

One of the studies that most clearly illustrates an important causal relationship between an agent's immediate environment and the relevant state of mind is based on previous work that being in a natural environment, or even simply looking at pictures of nature, has a restorative effect on cognitive processes, such as executive attention (Gamble et al., 2014). This particular study identifies a difference in the type of environment (i.e. natural or urban) that has this restorative effect, focusing on restoring *self-control resources*, depending on whether the person is neurotic or not; specifically, it was found that urban environment have a restorative effect on neurotic individuals, whereas natural environments are restorative for non-neurotic people (Newman & Brucks, 2016). The main point here is that certain environments have this capacity to significantly increase the likelihood of successful self-control by working to restore self-control resources. This kind of restoration presumably cannot happen at the same rate by means of the brain alone, but rather the agent has to interact with a particular type of environment to achieve this effect.

A somewhat controversial topic of research is the effects of color on behavior. While the research on this is very scattered and has mixed results (for a review see Elliot, 2015), there is some evidence from this body of literature that at least certain colors have a significant effect on certain behaviors relevant to self-control. One such case is the effect that color has on eating behavior, such as the color red reducing snacking behavior (Genschow et al., 2012); another is the avoidance tendency within achievement contexts, such as taking an intelligence test, that is elicited from viewing the color red (Elliot et al., 2007); lastly, blue lighting has been associated with higher performance on attention-based tasks (Lockley et al., 2006). Again, such studies are

far from forming the basis for any reliable behavioral stereotyping, especially since the meaning behind colors is heavily culturally constructed (e.g. red is a color of temptation in some cultures, yet a color of power and control in others). However, it is difficult to doubt that colors do have some impact on our mental states, as anyone who is choosing which color to paint their bedroom can attest to, thus this is a promising line of research to begin conducting in a more systematic way.

Related to self-control is focus and attention control, as these are two factors that can greatly influence success or failure in a self-control dilemma. There are various experiments that show the high impact of the types of things in one's immediate environment on focus and attention control. Even though the results of these experiments are not directly showing that the material environment is playing a causal role in producing successful self-control, the impact that these studies do demonstrate is suggestive that these effects can also extend to self-control. For example, cluttered environments have been linked with difficulties to focus and concentrate (McMains & Kastner, 2011). If messy environments distract people from focusing on their goals, then messy environments have the potential to facilitate weakness of will and, conversely, clean environments have the potential to facilitate self-control. Fragrance is another factor that contributes to different states of mind (for an extensive review on the effects of fragrance on psychophysiological activity, see Sowndhararajan & Kim, 2016): jasmine can increase feelings of wellbeing (Dade et al., 2002), lavender can reduce stress and perception of pain intensity (Kim et al., 2011), and peppermint has even been used to get people to exercise for longer (Raudenbush et al., 2002).

With the exclusion of the first study presented, regarding particular environments replenishing self-control resources, none of these experiments, by themselves, provide adequate justification for the idea that the immediate environment plays a causal role in producing successful self-control. Taken together, however, these experiments at the very least justify the need to further investigate this potential relationship between self-control and the agent's environment, so it is important not to dismiss the effect that environmental factors can actually have on producing specific behaviors.

5.3 The society

It should be no surprise that the quality and type of social connections can drastically alter someone's life in a myriad of ways, including the likelihood that an agent will be self-controlled. This is clearly exemplified in the practice of assigning sponsors in Alcoholics Anonymous and Narcotics Anonymous meetings, since the intention there is that two people going through the same experience can support each other to avoid relapse better than someone who cannot sympathize as well. There is evidence that certain self-controlling thoughts or states of mind cannot be thought without certain social factors in place.

Whether an agent will delay her gratification or not partially depends on social trust, since the agent has to believe that she will receive the long-awaited reward for her to be motivated to avoid the certain but smaller immediate reward (Michaelson et al., 2013). In this sense, no normal person would ever delay their gratification if there was no trust that she'll receive the greater reward, and there can be no trust if there are not certain social structures in

place to ensure that this transaction will be completed. In essence, this is how a typical job operates - a person delays the gratification of receiving their payment right away (most jobs have to wait two to four weeks in between getting paid for their work), but this system operates smoothly only because the employee trusts that the employer will write the check when the time comes. This trust is maintained by social organizations and structures such as third-party evaluations, government offices for providing support, insurance coverage, etc. A concept related to social trust is social support, which also has been shown to increase delay of gratification, specifically for individuals who have a hard time delaying their gratification (Liu et al., 2016). As noted by many philosophers, including Aristotle and Thomas Hobbes, human minds likely wouldn't be free to pursue longterm goals without social structures in place, instead being completely preoccupied with immediate satisfaction.

Empathy is often considered a social emotional process, since empathy consists in an agent taking on the emotional state of another individual. On the same note, oxytocin can be called a social hormone, since it is most known for reinforcing social bonds. Both empathy and oxytocin have been shown to be quite integral in successful self-control. One study reveals that disruption in the tempo-parietal junction (TPJ), a brain area largely responsible for cognitive empathy, decreases an agent's capacity to delay her gratification (Soutschek et al., 2016). The authors suggest that the same process used to make a person understand another's perspective works to make a person understand their future self's perspective. Some further support for this idea comes from another study which shows that the skills involved in comprehending other agents on one hand, and comprehending the self on the other, are interrelated and moreover, play an important role in the capacity to regulate emotions (Moriguchi et al., 2006). So far, there are only speculative explanations for why suspending activity in the TPJ has this diminishing effect on delay of gratification. One potential bridge between empathy and self-control is oxytocin, which is a hormone release during empathetic episodes. Obese men who were administered intranasal oxytocin showed increased activation in brain regions associated with cognitive control, as well as an altered motivational response to food related cues (Plessow et al., 2018). Similarly, Attention-Deficit and Hyperactivity Disorder and the impulsivity control issues characteristic of this disorder may be due to low levels of oxytocin (Demirci et al., 2016). Overall, it appears as though this social hormone is also highly critical for self-control.

Social factors play an important role in shaping the relevant mind states for successful self-control. These examples highlight the different types of social factors - from structures that reinforce trust to hormones that reinforce bonds - that can have a strong effect on the relevant thoughts. Society and social constructs have the power to modulate the relevant thoughts and, once again, the brain is highly unlikely to be solely responsible for successful self-control.

5.4 Justifying the rejection of intracranialism

In this section, I have presented several examples which collectively show that IA is false - there are cases where an agent has the relevant thoughts for self-control, but the brain alone was not responsible for this. Instead, some extra-cranial factor - bodily, environmental, or social - was playing a genuine role in producing either the appropriate behavior, the relevant self-controlling thoughts, or some mental state that is closely related to self-control (e.g. focus).

Admittedly, few of the studies mentioned in this section provide direct evidence for some extra-cranial factor being responsible for *self-control*, as opposed to some related state. Despite the fact that this relationship has not been systematically investigated, the other experiments presented should paint a hopeful picture for a situated perspective of self-control. Since it is the case that the body, the environment, or the society can play a causal role in shaping certain mind states related to or associated with self-control, then it isn't much of a logical leap to think that these extra-cranial factors can play a role in shaping the state of self-control itself. Repeating what was said throughout this section, there is plenty of evidence to justify a thorough empirical investigation of the exact roles that these factors play in producing particular behaviors. In the following section, I discuss what a situated perspective has to offer for the self-control literature.

6. Taking Stock and Moving Forward

Defining self-control as a mental ability severely limits the scope of strategies that could be utilized by people to achieve their goals, even in the face of temptation or when experiencing diminished motivation. Self-control appears to not be so much an ability, as it is a *system* consisting of several interconnected players that each play a role in producing the relevant mind states and behaviors. Understanding self-control will therefore require understanding each of these players and the precise roles that they play. Since situated views already assume that successful self-control will require specific coordination with the body, environment, and/or society, these views will be superior to any intracranialist position in not only the accuracy of predicting successful self-control, but will also have the advantage in designing therapies and making self-control more accessible for individuals suffering from impulse control disorders or chronic apathy.

The way in which self-control is portrayed from the intracranialist viewpoint makes this ability seem unfeasible in the synchronic sense. Let's return to one of the biggest questions within the literature, applied directly to intracranialism: how is an agent able to recruit the relevant cognitive processes for producing successful self-control *at the same moment* that she currently is experiencing strong motivational opposition (i.e. either in the form of a powerful impulse or a dismal lack of motivational resources)? Because this problem is so difficult to answer, some have taken the position that it is indeed impossible for an agent to recruit the right cognitive processes to fight motivational opposition. Kennett and Smith (1996) certainly take this position by arguing that self-control consists in training a predisposition to reflexively think the relevant thoughts, and Mele (1992) also recognizes that there is too much resistance to fight the opposition head-on, thus he recommends to refocus attention to a different goal. These are philosophical accounts that detail the theoretical inconsistencies which make make (intracranialist) self-control unfeasible in the face of opposition. Others have presented arguments based on empirical evidence that intracranialist self-control is unfeasible.

One such argument asserts that construing self-control as an ability consisting of effortful inhibition of impulses is a limited and incorrect way to describe what most people actually do in self-control dilemmas (Fujita, 2011). The argument reveals that three common self-controlling strategies are: avoiding situations where temptation is present, establishing heuristic-based habits that are triggered by the object of temptation, or using cognitive reappraisal to reconsider the

motivational salience of the object of temptation. This example highlights that self-control is less a matter of cognitive effort being directed towards changing a weak-willed state of mind, and more a matter of diachronic strategies like situation selection and training helpful habitual reactions.

A more explicit rejection of intracranialist self-control comes from a study which found that "…effortful self-control was consistently unrelated to goal attainment" (Milyavskaya & Inzlicht, 2017). Instead, goal attainment happens when individuals avoided experiencing temptations altogether because actively resisting or controlling temptations created a feeling of depletion or fatigue, which acted as resistance for achieving one's goals. Conversely, not fighting temptations conserves an agent's resources and energy, which she can then channel towards her goal pursuit and attainment.

A situated version of self-control avoids these problems in virtue of its broader scope regarding the types of strategies that can be utilized and how these strategies can be implemented in the face of opposition. Situated self-control is more feasible in these situations where motivational opposition is present, because while the mind (i.e. one's attention) is primarily consumed with focusing on the opposition, the body, for example, can still be manipulated in ways that produce the relevant thoughts and behaviors. Consider the power that a clenched fist has on self-control (Hung & Labroo, 2011), and how the hand spontaneously clenches when the brain perceives a difficult situation that requires endurance (e.g. having to endure the pain of going out into extremely cold temperatures when leaving the house in the winter months). Situated self-control will likely feel less effortful precisely because situated strategies offload that strain onto extra-cranial factors. These types of strategies are easier to implement and maintain, since the agent can rely on her behavior being shaped by external triggers instead of her own cognitive efforts.

So far, I have argued that self-control theorists - regardless of which discipline they hail from, whether philosophy, psychology, neuroscience, sociology, or some other academic department - ought to abandon the intracranialist assumption and instead adopt a situated perspective in order to make their respective theories of self-control both more useful and more accurate. I have remained agnostic on what type of situated view (e.g. embodied, embedded, extended, enacted, or distributed) gives the best account of self-control. That is a separate matter of debate. The main point here is that the self-control literature has its back metaphorically against the wall trying to explain how it is possible to be successfully self-controlled in the face of motivational opposition. The most promising solution that is within sight at the moment is to turn self-control's biggest enemies - the external triggers that automatically cause certain behaviors - into its greatest allies, by focusing on discovering the ways that these reliable triggers favor self-control. Making this switch requires that researchers expand their focus of investigation and make further efforts to understand the ways in which bodily processes or states, immediate material environments, and social contexts have positive effects on the relevant thoughts that matter for successful self-control.

Works Cited

Agroskin, D., Klackl, J., & Jonas, E. (2014). The Self-Liking Brain: A VBM Study on the Structural Substrate of Self-Esteem. *PLOS One, 9,* 1-8.

Bonelle, V., Manohar, S., Behrens, T., & Husain, M. (2016). Individual Differences in Premotor Brain Systems Underlie Behavioral Apathy. *Cerebral Cortex, 26,* 807-819.

Burnette, J. L., O'Boyle, E. H., Van Epps, E. M., Pollack, J. M., & Finkel, E. J. (2013). Mindsets Matter: A Meta-Analytic Review of Implicit Theories and Self-Regulation. *Psychological Bulletin, 139,* 655-701.

Clark, A., & Chalmers, D. (1998). The extended mind. *Analysis, 58,* 7-19.

Connor, T. D. (2014). Self-control, willpower and the problem of diminished motivation. Philosophical Studies: An International Journal for Philosophy in the Analytic Tradition, 168, 783- 796.

Dade, L. A., Zatorre, R. J., & Jones-Gotman, M. (2002). Olfactory learning: Convergent findings from lesion and brain imaging studies in humans. *Brain, 125,* 86-101.

Demirci, E., Özmen, S., & Öztop, D. B. (2016). Relationship between Impulsivity and Serum Oxytocin in Male Children and Adolescents with Attention-Deficit and Hyperactivity Disorder: A Preliminary Study. *Arch Neuropsychiatry, 53,* 291-295.

Duckworth, A. L., & Quinn, P. D. (2009). Development and Validation of the Short Grit Scale (Grit- S). *Journal of Personality Assessment, 91,* 166-174.

Elliot, A. J. (2015). Color and psychological functioning: a review of theoretical and empirical work. *Frontiers in Psychology, 6,* 1-8.

Elliot, A. J., Maier, M. A., Moller, A. C., Friedman, R., & Meinhardt, J. (2007). Color and psychological functioning: the effect of red on performance attainment. *Journal of Experimental Psychology: General, 136,* 154-168.

Fernandes, V. R., Ribeiro, M. L. S., Melo, T., de Tarso Maciel-Pinheiro, P., Guimaraes, T. T., Araujo, N. B., Ribeiro, S., & Deslandes, A. C. (2016). Motor Coordination Correlates with Academic Achievement and Cognitive Function in Children. *Frontiers in Psychology, 7,* 1-8.

Fujita, K. (2011). On Conceptualizing Self-Control as More Than the Effortful Inhibition of Impulses. *Personality and Social Psychology Review, 15,* 352-366.

Gamble, K. R., Howard, J. H., & Howard, D. V. (2014). Not Just Scenery: Viewing Nature Pictures Improves Executive Attention in Older Adults. *Experimental Aging Research, 40,* 513-530.

Genschow, O., Reutner, L., & Wänke, M. (2012). The color red reduces snack food and soft drink intake. *Appetite, 58,* 699-702.

Heath, J., & Anderson, J. (2010). Procrastination and the Extended Will.

Hung, I. W., & Labroo, A. A. (2011). From Firm Muscles to Firm Willpower: Understanding the Role of Embodied Cognition in Self-Regulation. *Journal of Consumer Research, 37,* 1046-1064.

Kennett, J., & Smith, M. (1996). Frog and Toad Lose Control. *Analysis, 56,* 63-73.

Kim, S., Kim, H. J., Yeo, J. S., Hong, S. J., Lee, J. M., & Jeon, Y. (2011). The effects of lavender oil on stress, bispectral index values, and needle insertion pain in volunteers. *Journal of Alternative and Complementary Medicine, 17,* 823-826.

Lee, E., & Kim, Y. (2017). Effect of university students' sedentary behavior on stress, anxiety, and depression. *Perspectives in Psychiatric Care, 55,* 164-169.

Liu, X., Wang, L., & Liao, J. (2016). Enabling Delay of Gratification Behavior in Those Not So Predisposed: The Moderating Role of Social Support. *Frontiers in Psychology, 7,* 1-12.

Lockley, S. W., Evans, E. E., Scheer, F. A., Brainard, G. C., Czeisler, C. A., & Aeschbach, D. (2006). Short-wavelength sensitivity for the direct effects of light on alertness, vigilance, and the waking electroencephalogram in humans. *Sleep, 29,* 161-168.

McMains, S., & Kastner, S. (2011). Interactions of top-down and bottom-up mechanisms in human visual cortex. *Journal of Neuroscience, 31,* 587-597.

Mele, A. R. (1992). Akrasia, Self-Control, and Second-Order Desires. *Nous, 26,* 281-302.

Mele, A. R. (2012). Backsliding: Understanding Weakness of Will. New York: Oxford Univeristy Press.

Michaelson, L., de la Vega, A., Chatham, C. H., & Munakata, Y. (2013). Delaying gratification depends on social trust. Frontiers in Psychology, 4, 1-7.

Milyavskaya, M., & Inzlicht, M. (2017). What's So Great About Self-Control? Examining the Importance of Effortful Self-Control and Temptation in Predicting Real-Life Depletion and Goal Attainment. *Social Psychological and Personality Science, 8,* 603-611.

Mischel, W. (2015). The Marshmallow Test: Understanding Self-Control and How to Master It. London: Transworld Publishers.

Moriguchi, Y., Ohnishi, T., Lane, R. D., Maeda, M., Mori, T., Nemoto, K., Matsuda, H., & Komaki, G. (2006). Impaired self-awareness and theory of mind: An fMRI study of mentalizing in alexithymia. *NeuroImage, 32,* 1472-1482.

Murray, J. E., Belin-Rauscent, A., Simon, M., Giuliano, C., Benoit-Marand, M, Everitt, B. J., &

Belin, D. (2015). Basolateral and central amygdala differentially recruit and maintain dorsolateral striatum-dependent cocaine-seeking habits. *Nature Communications, 6,* 1-9.

Newman, K. P., & Brucks, M. (2016). When are natural and urban environments restorative? The impact of environmental compatibility on self-control restoration. *Journal of Consumer Psychology, 26,* 1-7.

Raudenbush, B., Corley, N, & Eppich, W. (2001). Enhancing athletic performance through administration of peppermint odor. *Journal of Sports & Exercise Psychology, 23,* 156-160.

Raudenbush, B., Meyer, B., & Eppich, B. (2002). The effects of odors on objective and subjective measures of athletic performance. *International Sports Journal, 6,* 1-15.

Ryan, R. M., & Deci, E. L. (2000) Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being. *American Psychologist, 55,* 68-78.

Smith, A. P., & Woods, M. (2012). Effects of chewing gum on the stress and work of university students. *Appetite, 58,* 1037-1040.

Soutschek, A., Ruff, C. C., Strombach, T., Kalenscher, T., & Tobler, P. N. (2016). Brain stimulation reveals crucial role of overcoming self-centerdness in self-control. *Science Advances, 2,* 1-8.

Strang, S., Hoeber, C., Uhl, O., Koletzko, B., Münte, T. F., Lehnert, H., Dolan, R. J., Schmid, S. M., & Park, S. Q. (2017). Impact of nutrition on social decision making. *PNAS, 114,* 6510-6514.

Stephan, A., Walter, S., & Wilutzky, W. (2014). Emotions beyond brain and body. *Philosophical*

Psychology, 27, 65-81.

Sownndhararajan, K., & Kim, S. (2016). Influence of Fragrances on Human Psychophysiological Activity: With Special Reference to Human Electroencephalographic Response. *Science Pharmaceutica, 84,* 724-751.

Plessow, F., Marengi, D. A., Perry, S. K., Felicione, J. M., Franklin, R., Holmes, T. M., Holsen, L. M., Makris, N., Deckersbach, T., & Lawson, E. A. (2018) Effects of Intranasal Oxytocin on the Blood Oxygenation Level-Dependent Signal in Food Motivation and Cognitive Control Pathways in Overweight and Obese Men. *Neuropsychopharmacology, 43,* 638-645.

Tracy, J. (2017). Pride: The Secret of Success. Boston: Houghton Mifflin Harcourt.

Tuk, M. A., Trampe, D., & Warlop, L. (2011). Inhibitory Spillover: Increased Urination Urgency Facilitates Impulse Control in Unrelated Domains. *Psychological Science, 22,* 627-633.

Vandellen, M., Knowles, M. L., Krusemark, E., Sabet, R. F., Campbell, W. K., McDowell, J. E., & Clementz, B. A. (2012). Trait Self-esteem Moderates Decreases in Self-control Following Rejection: An Information-processing Account. *European Journal of Personality, 26,* 123-132.

Vierkant, T. (2014). Is Willpower Just Another Way of Tying Oneself to the Mast? *Review of Philosophy and Psychology, 6,* 779-790.

Walter, S. (2014). Situated Cognition: A Field Guide to Some Open Conceptual and Ontological Issues. *Review of Philosophy and Psychology, 5,* 241-263.

Zhao, D., Corsetti, M., Moeini-Jazani, M., Weltens, N., Tuk, M., Jan, T., Warlop, L, & Van Oudenhove, L. (2019). Defecatory urge increases cognitive control and intertemporal patience in healthy volunteers. *Neurogastroenterology & Motility, 31.*

Putting the Mind Back Together:
A Situated Model as an Alternative to Dual-Process Theories of Self-Control

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Abstract

Dual-process theories are based on the argument that the mind is split into two distinct processes, and are the dominant standard within self-control literature. A prominent example of such a position is the Divided Mind view (Sripada, 2014), which posits that there exist two motivational compartments - the rational and the emotional - and that self-control is a proprietary action belonging exclusively to the rational part of the brain.

A fairly recent shift in the cognitive sciences is to view the mind as not being solely encapsulated within the brain, but rather to necessarily involve external factors, such as the body, the immediate environment, and/or social networks. This alternative perspective started with the theory of situated cognition (e.g. Clark & Chalmers, 1998; Walter, 2014), and has been applied to more specific cognitive processes such as affectivity (Stephan et al., 2014; Colombetti & Roberts, 2014) and self-control (e.g. Hung & Labroo, 2011; Vierkant, 2014).

The goal of this paper is to present a situated model of goal-oriented behavior as an alternative to dual-process theories of self-control. In order to make this point, I will use the Divided Mind View (2014) as the representative of dual-process theories of self-control and present two challenges that this theory cannot readily account for: (1) the role of emotions in self-control, and (2) the role of situated factors in self-control. I will then introduce the situated model of goal-oriented behavior as an alternative to dual-process views, as this model does not split the mind and is able to account for both the role of emotions and the role of situated factors. The virtue of such a model, aside from easily accounting for the challenges raised for the Divided Mind View, is that this model provides alternative strategies for agents who find themselves in self-control dilemmas and have a hard time implementing the narrow set of strategies provided by the dual-process views. In other words, successful self-control becomes more accessible by putting the mind back together.

"Most of those who have written about the affects… seem to conceive man in Nature as a dominion within a dominion. For they believe that man disturbs, rather than follows, the order of Nature, that he has absolute power over his actions, and that he is determined only by himself."

- Benedict Spinoza, The Ethics (Preface of Book III)

1. Introduction

The fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) reveals that approximately 10.5% of the general population suffers from an impulse control disorder, a condition in which a person has severe difficulties in controlling her behavior. The fifth edition of this manual, the DSM-V, includes an entire chapter on disorders characterized by failures of self-control. The typical treatment for these disorders involves therapies focused on training deliberate intervention in one's own thought patterns, although such therapies are often not very effective and often take years of sessions before any results are observed. These therapies are based on the principle that the mind is divided into two different motivational processes and that self-control is exclusive to the process responsible for slow and deliberate thinking.

Dual-process theories, the dominant standard within the self-control literature, are based on the argument that the mind is split into two distinct processes, and are accompanied by a claim of control asymmetry whereby only one of the processes is responsible for producing successful self-control. A prominent example of such a position is the Divided Mind view (Sripada, 2014), which posits that there exist two motivational compartments - the rational and the emotional - and that self-control is a proprietary action belonging exclusively to the rational part of the brain.

A fairly recent shift in the cognitive sciences is to view the mind as not being solely encapsulated within the brain, but rather to necessarily involve external factors, such as the body, the immediate environment, and/or social networks. This alternative perspective started with the theory of situated cognition (e.g. Clark & Chalmers, 1998; Walter, 2014), and has been applied to more specific cognitive processes such as affectivity (Stephan et al., 2014; Colombetti & Roberts, 2014) and self-control (e.g. Hung & Labroo, 2011; Vierkant, 2014). A situated theory of self-control would argue that this ability, albeit being mental in nature, extends beyond the brain.

The goal of this paper is to present a situated model of goal-oriented behavior as an alternative to dual-process theories of self-control. This alternative model includes the physical and emotional states of the agent as necessary for producing the relevant behavior, thereby introducing two new factors that can be the source of a self-control strategy when motivational opposition threatens the goal-oriented behavior. In order to make this point, I will use the Divided Mind view (2014) as the representative of dual-process theories of self-control and present two challenges that this theory cannot readily account for: (1) the role of emotions in self-control, and (2) the role of situated factors in self-control. I will then introduce the situated model of goal-oriented behavior as an alternative to dual-process views, as this model does not split the mind in regard to control asymmetry and is able to account for both the roles of emotions and situated factors. The virtue of such a model, aside from easily accounting for the

challenges raised for the Divided Mind view, is that this model provides alternative strategies for agents who find themselves in self-control dilemmas and have a hard time implementing the narrow set of strategies provided by the dual-process views. In other words, successful self-control becomes more accessible by putting the mind back together.

2. Synchronic Self-Control and Motivational Opposition

A very general definition of self-control is the ability to regulate one's own thoughts, emotions, and/or behaviors. The reason why an agent would want or need to regulate her own thoughts, emotions, and behaviors is in order to pursue some goal that she has, or act upon a better judgment. A better judgment or goal, in this context, is a sincere all-things-considered decision about what is the best course of action for the agent at the moment that the decision is formed. An agent's goal-oriented behavior is thus the action(s) that she takes to pursue the goal or act on her better judgment. The main reason why an agent would need to engage in self-control is if her better judgment or goal is being threatened by some form of motivational opposition; this type of self-control consists in deploying some strategy that will allow the goal-oriented behavior to persist in the face of this opposition.

In this section, I will briefly explain what is motivational opposition and make a distinctions between two types of motivational opposition that are discussed throughout the self-control literature. I will also make a distinction between two types of self-control. Making these distinctions is important for the sake of clarifying the discussions and arguments in the remainder of this paper.

2.2 Two types of motivational opposition

There are two types of oppositions that can prevent an agent from engaging in goal-oriented behavior: external and internal. External opposition includes any physical barriers that prevent the agent from acting upon her better judgments. Physical barriers come in the form of objects or events that prevent the agent from pursuing her goal, despite her being fully motivated to do so. An example of external opposition would be an agent who is fully motivated to achieve her goal of running a marathon, but she is tied up in a locked room and thus cannot actually run.

Internal opposition, on the other hand, prevents the agent from pursuing her goals or acting upon her better judgments by creating *motivational conflicts* within the agent's mind. These mental barriers appear in the form of reasons that the agent perceives to act contrary to her better judgment or to simply not act on her better judgment at all. Overcoming internal opposition requires self-control, since the problem is motivational in nature rather than being a physical obstacle.

Internal opposition can itself be broken down into two types: temptations and diminished motivation. Temptation cases involve the wayward desire to do something contrary to one's own goal or better judgment. Such cases involve competing motivation, in that the motivation to satisfy the wayward desire is so strong that it competes for control of behavior with the motivation to pursue the goal. Classic examples of temptations are drugs for recovering addicts, chocolate cake and other fattening foods for dieters attempting to lose weight, and exciting

booze-filled parties for college students who have important assignments due. The presence of such temptations requires that the agent exercise self-control in order to not stray from pursuing the relevant goals. However, another form of internal motivational opposition that also requires self-control is diminished motivation, characterized by the lack of the desire to do anything, including pursuing one's goals (Connor, 2014). Diminished motivation cases do not involve competing motivation, but rather the lack of motivation altogether. A clear example of diminished motivation is the behavioral apathy that typically accompanies clinical depression. A less extreme example is sheer laziness, such as when an agent judges that she should, say, do the dishes, but cannot peel herself off of the couch to actually wash the dirty plates in her sink.

While the overwhelming majority of self-control theories restrict their scope of inquiry to temptation cases, a good theory of self-control ought to be able to prescribe strategies to overcome both temptation cases and diminished motivation cases.[18]

2.1 Two types of self-control

Whether an agent engages in goal-oriented behavior before or at the same time as she experiences some form of motivational opposition marks the difference between two types of self-control: diachronic and synchronic.

Diachronic self-control refers to instances where the agent regulates her own thoughts, emotions, and/or behaviors *before* motivational opposition arises. This type of self-control consists in deploying strategies in anticipation of some sort of opposition arising in the near future. One of the most common examples of this type of self-control is when a dieter removes all junk food from her home in anticipation that she will be tempted to break her diet when she sees the snacks at a later time. Another example of diachronic self-control is to hang up motivating pictures of physically fit and attractive people in one's workout space at home in anticipation of experiencing the lack of motivation to work out later.

Synchronic self-control refers to instances where the agent regulates her own thoughts, emotions, and/or behaviors *at the same time* that she experiences motivational opposition. Perhaps the most popular example of synchronic self-control is when a dieter refuses to eat a slice of chocolate that is tempting her to break her diet. In a diminished motivation case, an example of synchronic self-control might involve a clinically depressed agent pushing herself to get out of bed and go to work despite having no desire or energy to do so.

The majority of theories within this body of literature focus on attempting to explain instances of synchronic self-control, with much less focus being directed towards diachronic self-control. One reason why synchronic self-control receives more attention is because it is typically much harder to be self-controlled in the face of motivational opposition than it is to be self-controlled in anticipation of motivational opposition.

Since this paper is concerned with the practical import of self-control theories, particularly regarding the effectiveness and efficiency of the types of strategies that can be

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[18] Given that the majority of views focus exclusively on temptation cases, most of the discussions in this paper will also focus on these cases. However, the situated model of goal-oriented behavior that is presented in section 5 applies to both temptation cases and diminished motivation cases.

prescribed by such views for agents who struggle with motivational opposition, the following discussions and arguments will focus on synchronic self-control.

The following section presents a prominent view of how synchronic self-control is possible and since the rest of the paper will be based upon responding to this view, all mentions of self-control henceforth will refer to the synchronic type.

3. Splitting the Mind

Self-control is a mental capacity. At the same time, the impulsive threat to one's goals (i.e. a temptation) is a mental event. For every view which assumes that the mind - including mental capacities and mental events - is solely encapsulated within the brain, a dual-process theory becomes part and parcel. This is perhaps the easiest way to make sense of how the *cause* of goal-oriented behavior and the *threat* to goal oriented behavior can both be in the brain at the same time. Dual-process theories applied to self-control postulate two separate systems that motivate behavior - a quick automatic system, which processes information and motivates the corresponding action without requiring conscious awareness, and a slow deliberate system that does require conscious awareness (Sripada, 2014; Evans, 2003; Kahneman, 2012).

Utilizing a dual-process perspective to explain a self-control dilemma creates a breeding ground for control asymmetry: the deliberate reason-based mental processes becomes the part of the mind that *controls* actions, while the automatic impulse-based mental process becomes the part of the mind that *compels* actions.

In this section, I present the Divided Mind view (Sripada, 2014), which is a dual-process theory based view that makes precisely this distinction, namely, that reason is the controlling part that facilities self-control and emotion is the compelling part that threatens self-control. I will then briefly describe a more general dual-process theory in order to highlight that although this paper raises challenges for the Divided Mind view, this theory is being used as a representative of all theories of self-control that have a dual-process theoretical foundation and thus the challenges apply to all such theories.

3.1 The Divided Mind View

Chandra Sripada (2014) introduces the Divided Mind view (henceforth, DMV) as a way to account for cases of "full-blooded willpower[19]", that is, instances of a self-control dilemma where the agent performs an intentional action to prevent herself from indulging in some wayward desire that opposes her goals (48). Accounting for full-blooded willpower is necessary, according to Sripada, because two prominent views of self-control (i.e. those purported by Alfred Mele, 1992, as well as Jeannette Kennett and Michael Smith, 1996) preclude "stronger forms of

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[19] Some have argued that self-control and willpower are distinct capacities (e.g. Holton, 2003). Sripada, however, uses the terms willpower and self-control interchangeably, and the discussions within this paper shall do the same.

synchronic self-control" (2014, 48)[20]. The DMV is designed, according to Sripada, to account for these stronger forms of synchronic self-control (i.e. full-blooded willpower).

The fundamental premise of DMV is that the mind is divided into two motivational "compartments": the deliberative motivational system and the emotional motivational system. Both motivational systems produce desires to perform particular actions (i.e. action-desires), but each system produces its own species of action-desires, and does so in different ways.

The deliberative motivational system, Sripada explains, is comprised of the various cognitive processes that implement practical reason, that is, the weighing of reasons (50). The product of practical reason is a practical judgment, or an all-things-considered decision regarding the best course of action available to the agent. This practical judgment, according to Sripada, motivates action in one of two ways: either indirectly, by mediating intentions, or directly, by creating a practical action-desire. Overall, the deliberative motivational system functions in a slow and controlled manner to assess all relevant information and carefully form the right judgment regarding which action is in the agent's best interest.

The emotional motivational system, on the other hand, involves processes associated with emotions, drives, and cravings. This system produces emotional action-desires that arise from automatic emotional appraisals. Emotions, Sripada contends, are "triggered responses to certain prototypical sorts of events of concern to the person" (50). This triggered response is characterized by "a suite of coordinated cognitive and physiological changes", which, in turn, create "motivations to pursue certain characteristic sorts of behavior" (50). In sum, an emotional action-desire is created rapidly through an automatic process that does not require conscious awareness: the stimulus almost instantly causes the cascade of changes, and the changes reflexively cause a specific action. Importantly, Sripada argues that the fact that an emotional action-desire can be recalcitrant – persisting in its motivational force despite the practical judgment that this action-desire is the worse option available to the agent – is evidence that these two motivational systems are independent of each other.

Willpower, Sripada continues, is a proprietary action exclusively initiated and maintained by the deliberate motivational system because the "exercise of willpower has the effect of attenuating, blocking or in some other way modifying the motivational properties of an action-desire produced by the emotional motivation compartment" (51). In other words, the emotional motivation system is responsible for creating the temptation to act contrary to one's goals, while the deliberate motivational system fights that temptation so that the motivation to be self-controlled can prevail.

The deliberate motivational system initiates and maintains willpower by providing its own set of causal powers for suppressing these wayward temptations. When a goal and a temptation undergo a motivational contest, Sripada explains, the temptation will always win

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[20] How these two views preclude stronger forms of self-control is irrelevant to this paper, but I will briefly explain the accusation for interested readers. According to Sripada, Mele's view of self-control is "ancilliary" in the sense that self-control occurs when an agent begins satisfying some wayward desire or temptation, but then stops themselves from continuing to satisfy the desire fully. Kennett and Smith present a "non-actional" view, in the sense that they argue that any instance of successful self-control cannot be a deliberate action but is rather an unmotivated reaction that arises from a trained predisposition. Neither view, Sripada argues, accounts for "full-blooded willpower", that is, an instance where an agent is successfully self-controlled intentionally and deliberately (contra the non-actional view) but before she even begins to satisfy her wayward desire (contra the ancillary view).

because it will presumably always have a higher desire-power; this is a claim assumed to be true for self-control dilemmas. However, Sripada continues, when willpower enters the picture, the contest between the goal and the temptation is no longer a purely motivational contest, but rather becomes a regulation-mediated contest. When the strife between the goal and the temptation is a regulation-mediated contest, then the independent set of causal powers possessed by willpower - Sripada calls the value of these causal powers reason-power - add an extra boost of motivation to the better judgment, allowing the original practical judgment to beat the temptation. DMV thus characterizes emotions as the source of self-control problems, and reason as the answer to those problems.[21]

Importantly, Sripada emphasizes that "dividing the mind into motivational compartments *in some way or other* is a necessary condition for the existence of full-blooded exertions of willpower" (2014, 49-50). In other words, Sripada is claiming that a dual-process view is necessary to make sense of the robust notion of self-control, whether that dual-process view makes the kind of distinction that he makes (i.e. reason and emotion), or some other kind of division. This claim reflects my earlier point that the intracranialist assumption of self-control, namely, that self-control is constrained to the borders of the brain, creates a necessity for dividing the mind in some way or another in order to be able to account for the existence of successful self-control.

3.2 More general dual-process theory

DMV is a specific version of a dual-process theory that is tailored to explain an agent's ability to be self-controlled. This version makes the distinction between two motivational systems, the deliberate motivational system and the emotional motivational system. Sripada points out that even if this distinction turns out to be false, a dual-process distinction will nevertheless survive as the only viable explanation of how self-control is possible. Most, if not all, dual-process theories that carve out room for explaining self-control or self-control-like behavior will likely also endorse a control asymmetry.

A more general dual-process theory makes a distinction between two cognitive systems, simply named System 1 and System 2. System 1 is the universally share cognitive system that humans and other animals shares, as it includes instinctual behaviors that are innately programmed into our minds; this system operates quickly and automatically, and only the final product of this system becomes available to consciousness (Evans, 2003). Conversely, system 2 is believed to be uniquely human since it facilitates abstract hypothetical thinking; this system operates slowly and is sequential in nature, making use of the working memory system, and the typically the entirety of its processing is available within conscious awareness (Evans, 2003).

While this particular type of dual-process theory is not strictly a theory of self-control, there is some room carved out within this System 1 and System 2 distinction for explaining self-control-like behavior. Evans (2003) posits that "… psychologists need to focus on the interaction of the two systems and the extent to which *volitional process in System 2 can be used to inhibit*

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[21] Here, some readers might feel as if Sripada's position is presented as a strawman, thus it is worthwhile to point out that Sripada himself admits that the DMV is meant to capture the ancient divide between reason and emotions (pg.49).

the strong pragmatic tendencies to response in inference and judgment that come from System 1, especially where the latter are known to result in cognitive biases" (458, my emphasis). The point here is that the will - the closest correlate to self-control that this theory discusses - is a process reserved System 2, whereas System 1 is the one that needs to be inhibited and controlled. The control asymmetry is thus also prevalent in this more general dual-process theory, with the slow and deliberate cognitive process being the one that does the controlling and the quick and automatic cognitive process being the one that must be controlled.

It is important to recognize this inherent control asymmetry because the following section raises certain explanatory challenges that pertain to this idea that self-control is a proprietary action. DMV is used as a representative view as this is the clearest example of a dual-process theory aimed directly at explaining the phenomenon of self-control, but all theories of self-control that have dual-process roots seem to share this idea that automatic and subconscious cognitive processes cannot genuinely produce successful self-control. The challenges raised, therefore, apply to dual-process theories of self-control in general, despite being framed as challenges directed at the DMV version of a dual-process distinction.

4. Two Explanatory Challenges for Dual-Process Views

Sripada introduces the DMV as an alternative to two prominent views of self-control because, as he argues, they preclude "stronger forms of synchronic self-control" (2014, 48). However, the same challenge can be raised for Sripada's own view: "there may be still stronger forms of synchronic self-control that" a divided mind view precludes (48). Sripada's notion of self-control as inhibiting emotional action-desires cannot account for the causal role that emotions can play in successful self-control, or for the causal role that situated factors (i.e. the body, the immediate environment, and social networks) appear to play in successful self-control. Dual-process views in general will have a hard time account for either of these causes of self-control, as both are traditionally lumped up in the "automatic" category of motivation.

In this section, I will first explain the role that emotions very likely play in synchronic self-control by making an analogical argument with the role that emotions play in moral motivation. I will also briefly describe some empirical evidence that empathy plays a vital role in successful self-control. Then, I will briefly introduce some empirical evidence that shows the role of situated factors in successful self-control. Dual-process theories such as DMV will have a hard time accounting for any of this empirical evidence.

4.1 Accounting for the role of emotions

To show that emotion-based willpower can potentially work to overcome temptation, it is important to consider another body of literature that is concerned with overcoming temptation - the moral motivation literature. Theories of moral motivation have, for the most part, accepted that emotions can genuinely participate in producing the right sorts of (moral) behaviors (e.g. Haidt, 2003; Hardy, 2006; Tangney, Stuewig & Mashek 2006). Similarly, theories of self-control are involved in explaining how to produce the right sorts of *practical* behaviors. There are at least three significant similarities - function, process, and emotions recruited - between moral

motivation and self-control motivation. Identifying these similarities allows for an analogical argument in support of the conclusion that emotions can genuinely participate in successful self-control over temptation.

The general function of both moral and self-control motivation is to produce goal-oriented behavior, that is, actions that are performed in order to achieve something that is judged as good. Whether the good in question is a moral good or a practical good is a trivial distinction in this context - what matters is that both types of motivation function to achieve some sort of perceived good.[22] Importantly, achieving good things is often accompanied by a certain degree of difficulty and struggle, so both moral motivation and self-control motivation function not just to maintain goal-oriented behaviors, but must also sometimes function as defense mechanisms for when difficulties and struggles arise.

The process by which either the moral or the self-controlling goal is achieved is through delaying one's own gratification. In instances of successful self-control through delay of gratification, an agent forgoes a smaller but immediate (or sooner) reward in exchange for a larger reward at some future time. It is quite obvious that successful self-control in the face of temptation is gratifying only at a later time, when the force of the temptation is no longer being felt by the agent. While there are many examples where morally good behavior is instantly gratifying, such as the high moral praise and gratitude received for risking one's own life to save another, the more mundane and common cases of moral behavior are typically not instantly gratifying. Telling the truth or being honest, for example, often involve saying something that will hurt, offend, or otherwise negatively affect another person.[23] While telling the truth despite the unpleasant circumstances is deemed as morally good, the gratification of doing so is rarely felt at the moment, but rather while reflecting back on that moment at a later time. Correspondingly, common immoral behaviors - such as cheating, lying, stealing, etc. - are usually instantly gratifying, with the negative consequences occurring at a later time. Overall, overcoming temptation - whether it is the temptation to break one's diet by indulging in a slice of chocolate cake or the temptation to lie in order to preserve a false sense of social harmony - involves not taking the easy instantly-gratifying road, but rather facing an unpleasant situation in order to feel good about oneself later. In this sense, many moral and self-controlled behaviors involve the process of delaying gratification.

The emotions that are recruited for moral motivation are typically self-conscious emotions, such as shame or pride (Hardy, 2006). Empathy, although arguably not an emotion itself but rather a process by which we feel the emotions of others, is also very important for moral behavior (Eisenberg & Mussen, 1978; Hoffman, 2001; Churchland, 2012). While there are

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[22] It should be noted that all instances of self-control involve practical goals, but not all practical goals require self-control. Some practical goals do not involve judgments about something being ultimately good, or better, or the best (e.g. choosing to clean one's house on Tuesday when one's schedule is equally clear on Wednesday), whereas all self-control goals are based on a value judgment. So, while a moral goal is based on a judgment about the best moral course of action, a self-control goal is based on a judgment about the best practical course of action.

[23] The claim is not that *all* instances of telling the truth (e.g. uttering "grass is usually green" or "the Earth revolves around the sun") often have these negative social consequences. Rather, the claim here is that for all instances of an explicit moral judgment that "I ought to tell the truth in this situation", many of those instances tend to involve perceived negative social consequences of being honest in that situation.

currently limited empirical studies which confirm that self-conscious emotions participate in self-control, there is evidence that empathy is vital for delay of gratification: when activity in the temporoparietal junction, a brain area largely responsible for cognitive empathy, is temporarily suspended through transcranial magnetic stimulation, individuals become significantly worse at delaying their gratification (Soutschek et al., 2016). The authors argue that lack of self-control is essentially attributed to a bias for the present self, as opposed to empathizing with the future self. If empathy is just as important for self-control motivation as it is for moral motivation, then perhaps self-conscious emotions that promote moral behavior are also necessary for self-control. Pride, for example, has been suggested to be important for practical goal-oriented behavior (Tracy, 2018).

In sum, the claim that emotions can genuinely participate in producing morally good behavior in the face of "the temptation to sin" is not controversial for theories of moral motivation. Since moral motivation and self-control motivation share the same function, process, and recruit the same emotions, then it ought not be controversial to make the claim that emotions can genuinely participate in producing self-controlling behavior in the face of temptation.[24] However, Sripada is very clear that according to the DMV, emotions cannot genuinely participating in producing successful self-control, as this is a proprietary action exclusive to the deliberate motivational system. For this reason, the DMV cannot account for any instance of emotions actively working to increase the likelihood of successful self-control in any genuinely causal way.

4.2 Accounting for the role of situated factors

With the rise of situated cognition, more and more empirical evidence for the intimate relationship between the mind and factors external to the brain is emerging. These relationships are now being studied in very specific contexts, such as situated cognition of emotion or, more relevant to the current discussion, situated cognition of self-control. There is some empirical evidence that an agent's body, immediate environment, and social networks can play a vital role in producing either the relevant mental states for self-control, or the behavior itself.

A set of experiments, for example, demonstrates that muscle tension - either a clenched fist or a tightened calf muscle - significantly increases the likelihood of self-control in various domains (Hung & Labroo, 2011). These experiments found that muscle tension made participants able to attend to unwanted stimuli better, drink significant amounts of a disgusting vinegar solution, withstand physical pain for longer durations of time, and make healthier spontaneous decisions regarding which snacks to consume. A different experiment, which won the Ig Nobel prize, reveals that the urge to urinate increases impulse control (Tuk et al., 2011). A follow-up study shows that the (moderate) need to defecate also appears to increase cognitive control, as well as inter temporal patience (Zhao et al., 2019). These studies illustrate the concept of embodied self-control, where the appropriate behavior is not dependent upon the deliberate motivational system but rather can be achieved by manipulating bodily states.

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[24] The claim here is not whether emotions actually *do* or *do not* participate in self-control, but rather that emotions *can* participate in self-control and investigating this matter is worthwhile.

When it comes to the relationship between an agent's immediate environment and her goal-oriented behavior, the evidence is not quite as direct as with the body. However, there are still a few studies which suggest that certain environmental factors can play a causal role in producing the right sort of mental state for self-control. One such study is based on previous work that being in nature, or even just looking at pictures of nature, has a restorative effect on several cognitive processes, such as executive attention (Gamble et al., 2014); this study distinguishes between two types of environments - natural or urban - that have this restorative effect on two types of persons - non-neurotic or neurotic, respectively (Newman & Brucks, 2016). In other words, natural environments have a restorative effect for non-neurotic people but do not work quite as well for neurotic individuals, who experience the restorative effects when being exposed to an urban environment instead. Importantly, this study focuses on the restorative effects specifically on self-control resources. If an agent's immediate environment - whether natural or urban - can have a restorative effect on depleted self-control resources, then the environment can be said to play a vital role in significantly increasing the likelihood of successful self-control.

The quality of social networks can drastically impact many dimensions of an agent's life, and this includes her capacity to be self-controlled. Social trust is crucial for delaying gratification (Michaelson et al., 2013). This makes intuitive sense considering that most instances of a delayed reward are only guaranteed because of the social structure in which we live.[25] A related concept is social support, which has also been associated with an increase in the ability to delay gratification, especially for people who are not so good at this ability to begin with (Liu et al., 2016). On a similar note, it has already been mentioned in section 3.1 that cognitive empathy appears to be crucial for the ability to delay gratification (Soutschek et al., 2016). The bridge between empathy and self-control that allows the former to have this effect on the latter might be oxytocin, the hormone that is released during empathetic episodes. Oxytocin is often referred to as the social hormone, since its function appears to be to reinforce social bonds to specific individuals. A study found that obese men who are administered oxytocin experience increased activation in brain regions linked with cognitive control; these men also exhibit an altered motivational response to food related cues (Plessow et al., 2018). Following this line of research, another study found that the impulsivity control issues that occur for agents who have been diagnosed with Attention-Deficit and Hyperactivity Disorder may be attributed to low levels of oxytocin (Demirci et al., 2016). In sum, these studies suggest that the social dimension of an individual's life has a significant relationship with the capacity to be self-controlled.

Certainly, DMV cannot deny the empirical evidence that these automatic processes genuinely contribute to successful self-control. At the same time, this view (and other dual-process based theories of self-control) will have a difficult time accounting for the role that any of these factors play in increasing the likelihood of successful self-control. This difficulty is due to the fact that DMV places all the burden of successful self-control on the deliberate motivational system. All of the processes mentioned in this section circumvent the deliberate

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[25] If, for example, we lived in a country where the life expectancy is 25 years of age, then there is little point to delay the gratification of smoking a cigarette now in exchange for the health benefits one will experience in the future.

motivational system and instead are more akin to impulses because of their automatic and non-conscious processing.

In the following section, the situated model of goal-oriented is presented as an alternative to dual-process theories of self-control such as DMV. This system-based model integrates both emotional processes and situational factors into its basic framework, thus it avoids the explanatory challenges that have been raised for dual-process theories such as DMV.

5. An Alternative Model

Dual-process theories, while certainly being dominant within the self-control literature, also face a multitude of empirical and conceptual problems, including problems distinct from the ones raised in this paper (Fujita et al., 2018). Dividing the mind is a natural tendency when assuming intracranialism, that is, implying that self-control and motivational opposition occur solely within the confines of the cranium. Putting the mind back together circumvents the challenges raised against the divided mind views, but also requires to expand the notion of self-control beyond the brain. By adopting a situated perspective, one where self-control, as a mental ability, is assumed to involve the brain, but also the body, the immediate environment, and social networks, we can substitute dual-process views with a more holistic system view.

In this section, I introduce the situated model of goal-oriented behavior as an alternative to dual-process views of self-control. In this model, the mind is discussed as having two dimensions (i.e. perceptual and emotional), although these two dimensions do not stand in opposition of each other or facilitate any kind of control asymmetry. Instead, the mind is just one feature of a self-control system that involves several members operating in tandem. I first explain how the various features of this system work together to produce goal-oriented behavior in optimal conditions, without the presence of motivational opposition. I then describe what happens when motivational opposition does arise, and how this model offers alternative strategies for overcoming motivational opposition that work to offload the burden from the brain and increase the likelihood of successful self-control.

5.1 Situated model of goal-oriented behavior

The situated model of goal-oriented behavior (henceforth, the situated model) involves several elements that operate in an interdependent way to translate a particular goal into the corresponding goal-oriented behavior. The goal-oriented behavior can be any action performed in *pursuit of the goal* (e.g. remaining on a diet to pursue the goal of being able to fit into a particular size of jeans), or any action that *achieves the goal* itself (e.g. completing an assignment on a particular due date), depending on the kind of goal the agent holds (i.e. ranging from the more concrete and immediate to the more abstract and future-based).

Before an agent can intentionally perform the relevant goal-oriented behavior, she must be in the relevant mental state. The relevant mental state has two dimensions: the perceptual and the emotional. The perceptual dimension involves any implicit beliefs or perceptions regarding her own self. The relevant implicit beliefs or perceptions that produce the appropriate goal-oriented behavior include: perceiving oneself as autonomous and competent (Ryan & Deci,

2000); being gritty, which consist in a recognition of one's own passion(s) and being perseverant in the face of longterm challenges (Duckworth, 2016; Duckworth & Quinn, 2009); believing that one's skills and abilities are malleable and able to be improved (Burnette et al., 2013; Dweck, 2017); having high self-esteem (Vandellen et al., 2012; Agroskin et al., 2014); and acknowledging one's own achievements (Tracy, 2016). Conversely, if an agent perceives herself to have low autonomy, as incompetent, as having no passion or reasons to be persistent, believing that her skills are fixed and unchangeable, having generally low self-esteem and believing that she has never achieved anything worthwhile, then she will not be in a position to *intentionally* initiate the appropriate goal-oriented behavior. How can one pursue a goal without the belief that one can actually do it?
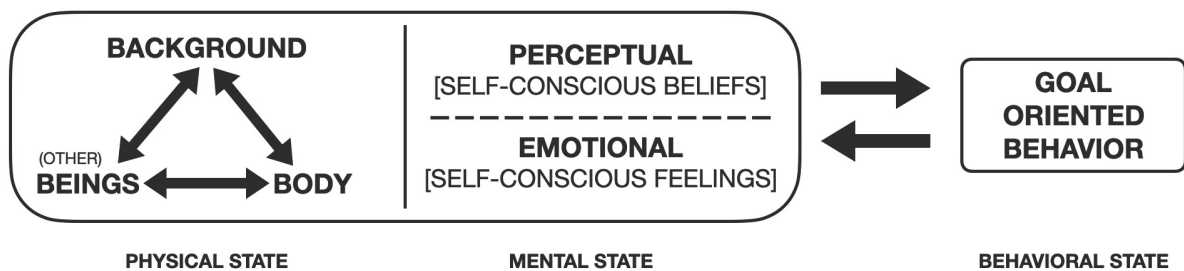
The emotional dimension of the agent's relevant mental state refers to the affective feeling that reflects the beliefs within the perceptual dimension. This dimension contains self-conscious emotions, that is, emotions that arise in response to reflecting on the self (Lewis, 2011). Self-conscious emotions include embarrassment, jealousy, empathy, shame, guilt, hubris, and pride, although it is not yet clear whether all of these emotions actually participate in directly motivating goal-oriented behavior. The positive relationship between pride and goal-oriented behavior has received significant empirical attention (Tracy, 2016). It should be noted here that these studies which reveal the role that pride plays in directly motivating goal-oriented behavior make a distinction between authentic pride and hubristic pride. Pride is a positive emotion that is felt when one privately reflects upon one's own accomplishments or positive qualities. Hubris, on the other hand, is a public display of fake pride that is expressed in order to compensate for some sort of deficiency that one perceives about oneself. It is not very surprising that authentic pride has been correlated with self-control, as the beliefs that matter for goal-oriented behavior (e.g. positive beliefs regarding one's own autonomy, competence, resilience, etc.) are precisely the type of beliefs that an authentically proud agent is likely to hold about herself. Similarly, some studies investigate the relationship between shame and goal-oriented behavior. Such studies reveal that both anticipated and occurrent shame is associated with *failures* of self-control (Patrick et al., 2009; Leach & Cidam, 2015). Unfortunately, the list of research conducted to test the relationship between self-control and self-conscious emotions is quite short, and further investigation is required. The observations that pride and shame both impact self-control, however, should be sufficient reason to warrant such investigations.

According to the situated model, the relevant perception of self, and the corresponding self-conscious emotions, are constituted by an interplay between three extra-cranial factors, which I refer to as the three B's: the body, the background, and other beings. The three B's comprise the physical state of the agent. The body includes the agent's brain, nervous system, organs, limbs, internal bodily processes (e.g. breathing, blood pressure, hormone regulation, etc.), and anything else that can be said to belong to a human body. The agent's background refers to her immediate environment, including objects or tools that she can interact with and utilize. Other beings are the living organisms involved in the agent's social networks, including other human beings and animals.

There is a considerable amount of empirical evidence which shows that manipulating one of the three B's has a significant effect on the relevant mental states (i.e. either emotion or perception); there is also some evidence which shows that manipulating one of the three B's has

an effect directly on the self-controlling behavior. Certain bodily states, such as hormones (e.g. Ali et al., 2018), breathing rates (e.g. Philippot & Blairy, 2010), posture (e.g. Carney et al., 2010; Carney et al., 2015), nutrition (e.g. Strang et al., 2017), facial expressions (e.g. Soussignan, 2002), and movements (e.g. Casasanto & Dijkstra, 2010) causally impact mental states associated with goal-achievement. Specific to self-controlling behavior, clenched muscles (Hung & Labroo, 2011) and the urge to expel waste (Tuk et al., 2011; Zhao et al., 2019) directly affect the capacity to be self-controlled. Similarly, certain backgrounds, that is, features of an agent's immediate environment, such as certain colors (for a review, see Elliot, 2015), fragrances (for a review, see Sowndhararajan & Kim, 2016), and cluttered work spaces (McMains & Kastner, 2011) also have causal influence over certain relevant mental states. For self-control in particular, natural environments (Gamble et al., 2014) or urban environments (Newman & Brucks, 2016) have been shown to have a restorative effect on vital self-control resources. Lastly, the beings with whom an agent shares relationships and social interactions also matter for specific mental states, as evident by the significant effects of living in socioeconomically disadvantaged neighborhoods (Hackman et al., 2010), being married (Holt-Lunstad et al., 2008), and having pets (Brooks et al., 2018). Directly applicable to self-control are the concepts of social trust (Michaelson et al., 2013) and social support (Liu et al., 2016). To sum up, an agent's overall physical state (i.e. the interplay between the three B's) has the power to create or reinforce a particular mental state (i.e. perceptions and emotions), which then, in turn, causes a subsequent behavioral state (i.e. the goal-oriented behavior). In this sense, the mental state acts as a bridge between the physical state and the behavioral state of the agent within this process of motivating goal-oriented behavior.

The Situated Model of Goal-Oriented Behavior

Once the agent reaches the behavioral state, the causal chain reverses direction. Successfully performing the goal-oriented behavior creates or reinforces the mental state of the agent (i.e. implicit beliefs about the self and certain self-conscious emotions) and produces relevant changes in the physical state of the agent. Perhaps the most salient changes happen in the agent's body: brain activity changes, hormones are released, posture is adjusted, etc. There could be some observable changes with how an agent interacts with or perceives her environment; perhaps she begins to notice more vividly pleasant stimuli such as colors or smells, or just generally have a more positive appreciation of her surroundings. It is certainly very likely

that there will be changes in how the agent interacts with other beings, such as exuding more confidence and being more outgoing, or a diffusion of social awkwardness during interactions.

The situated model depicts how a goal is translated into a goal-oriented behavior in the absence of any opposition. However, quite often motivational opposition arises and disrupt this process. By identifying where within this process that motivational opposition arises, a situated solution can be implemented to overcome the opposition while offloading the bulk of the pressure from the brain having to do all the self-controlling work.

5.2 Overcoming motivational opposition

When motivational opposition arises, it originates somewhere within the three B's. Temptation, for example, usually occurs when an agent's background contains some object that triggers a wayward desire (e.g. chocolate cakes for dieters, cigarettes for agents who are trying to quit smoking, the "watch next episode" button flaunted by Netflix, etc.). Diminished motivation often occurs because of imbalances within bodily states (e.g. not enough sleep, diet that lacks energizing nutrients, hormonal fluctuations, etc.). However, temptation can also occur because of imbalances within bodily states (e.g. craving cake is more common when one experiences low blood sugar) and diminished motivation can occur because of one's background (e.g. trying to work when one is snuggled up in a comfy sleep-inducing bed with the television tuned to an interesting show). Beings with which one consorts can also cause either type of opposition (e.g. attractive young ladies and gentlemen being a source of temptation for married folks, or lazy friends that coax us to lay around on the couch and not do much of anything).

When motivational opposition arises within the three B's, the corresponding mental state that is produced most likely involves negative appraisals of self and corresponding negative self-conscious emotions (e.g. perceiving low competence and the subsequent shame in the lack of one's own capacity to produce changes), and thus drastically increases the likelihood of weak-willed behaviors (i.e. performing any action that is contrary to one's goal). While having an imbalance with just one B will have a lower probability of producing a negative mental state, an imbalance in two or all three B's raises the stakes. For example, if an agent's body is off due to poor sleep, bad nutrition, and lack of exercise, but her background is set up with positive stimuli and the beings in her life are highly supportive, there is a smaller chance that she will have the negative perceptions and emotions that lead to weak-willed behavior. However, if this agent also finds herself within an environment filled with temptation triggers and her social relationships poorly support her goals, then it is highly unlikely - perhaps even impossible - that she will have the relevant positive mental state that is required to produce goal-oriented behavior. Thus, increases in the imbalance of an agent's physical state results in an increasingly negative mental state, and produces weak-willed behavior that is in direct opposition to goal achievement.

In order to fix this imbalance and increase the probability of achieving the goal by producing the appropriate goal-oriented behavior, the relevant mental state needs to be reestablished. However, as mentioned before, the most efficient and effective way to reestablish the proper mental state is not to target the mental state by itself, but to change it through the factors that skewed it to begin with, namely, by reestablishing order amongst the three B's.

When an agent's goal is already being threatened by motivational opposition, the easiest "B" to access is the body. Making relevant changes in one's immediate environment or social networks can be incredibly difficult when in the throes of fighting some occurrent motivational opposition, but an agent always has access to changing certain aspects of her bodily state (e.g. posture, facial expression, or breathing pattern). Manipulating particular bodily states can be sufficient to overcome the threat to the goal by recalibrating the appropriate mental state. Once the threat is overcome and the agent is back to pursuing or achieving her goal, then the other B's can be rebalanced in order to prepare for and guard against future threats. Rebalancing one's background can be achieved by either removing potential temptation triggers (e.g. throwing away all unhealthy snacks if one is on a diet) or adding some environmental "triggers of strength" (e.g. pictures of beautiful thin people, or motivational posters). The effects caused by beings in one's life can also be rebalanced by either severing social ties with certain unhelpful individuals (e.g. recovering addicts ending relationships with other drug users), or creating relationships with those that offer support (e.g. attending weekly meetings with other recovering addicts).

Manipulating one's own bodily state while experiencing some sort of motivational opposition can be performed deliberately, if the agent is consciously aware that she is in the midst of this self-control dilemma, or such bodily changes can occur reflexively. There are already certain bodily reactions that are instinctual for humans, such as tensing one's muscles when pain is either being anticipated or experienced in order to increase endurance, but it also isn't difficult to train such reactions. Muscle memory can be trained in as little as two thirty-minute sessions (Celnik et al., 2006). Moreover, there is even evidence which suggests that muscle memory can be trained through action observation alone (Stefan et al., 2005). This can be an extremely useful alternative strategy for when an agent isn't capable of deliberately manipulating her own mental state directly, since the relevant mental changes can still be indirectly achieved through the body's subconscious reactions.

The situated model is an alternative to DMV, as the former facilitates very different strategies for self-control than the latter. However, just because a model is an alternative doesn't necessarily make it the superior one. The following section outlines some reasons for why the situated model is superior to dual-process theories of self-control such as DMV.

6. Is The Situated Model Superior to DMV?

The situated model is designed to account for the roles that emotions and situational factors play in successful self-control. DMV is unable to account for these roles: the model explicitly rejects emotions as being able to genuinely participate in producing self-control; the model also implicitly rejects situational factors as being able to genuinely participate in producing self-control, since conscious awareness is not required for these situational factors to have a causal impact on behavior. The situated model is superior to DMV in being able to account for these roles, but there are two other salient reasons why the situated model is superior to DMV.

In this section, I will explain these two additional reasons for why the situated model is superior to DMV. The first is based on empirical evidence that agents who are successful in

achieving their goals are not ones who recruit self-control in the face of motivational opposition, but rather those who avoid the opposition altogether. This evidence has led some to reject the importance for self-control. The second reason points to empirical evidence which reveals that the brains of agents who need self-control the most (e.g. those with impulse control disorders) are unable to recruit the deliberate motivational system in moments when motivational opposition is present. Taken together, these two reasons show that the narrow conception of self-control purported by DMV is not very effective to help people overcome motivational opposition and achieve their goals.

6.1 Rejecting the importance of self-control

DMV adopts a narrow definition of self-control as basically the effortful inhibition of impulses. The American Psychological Association defines self-control in a similar way, as the ability to resist short term temptations (Weir, 2012). It has been argued, both in this paper and by other authors (e.g. Fujita, 2011) that this definition is too narrow. There also exists empirical data suggesting that this definition is too narrow and doesn't capture what actually happens when people achieve their goals.

A study investigating the relationship between the effortful inhibition of impulses and actual goal achievement "found that effortful self-control used to inhibit impulses (i.e., resisting desires) did not play a role in goal pursuit in daily life" (Milyavskaya & Inzlicht, 2017). The study recruited students with self-identified goals and using an experience sampling method, gathered data throughout the day for the duration of a week. Past of the information gathered is when the participants experienced a temptation, measured as a strong desire with a high level of conflict for their self-identified goals, and whether the participants recruited self-control, measured by the degree to which they tried to resist the temptation. The study reveals that exercising self-control did not increase the likelihood of accomplishing one's goals, but instead, the factor that best predicts whether a person's goals will be accomplished is the avoidance of temptation altogether. These results led the authors to suggest that "effective self-regulation may be effortless rather than requiring active self-control" and ultimately reject the importance of self-control defined as the effortful inhibition of impulses.

The situated model, on the other hand, implies a much broader notion of self-control and, by extension, allows a larger variety of strategies to be designed and prescribed for overcoming motivational opposition. Self-control, on this model, doesn't have to be effortful, but can instead rely on more habit-like automatic responses that achieve the same results. How much effort an agent *exerts* is non-veridical to how much effort the agent *feels* she is exerting (e.g. Bayne & Levy, 2006; Csikszentmihalyi, 1990), so one can perform the relevant actions to achieve self-control (e.g. manipulating one's own bodily states) while experiencing little to no feelings of struggle. In other words, the situated model allows for instances of self-control that are themselves effortless impulses rather than demanding that self-control is always an effortful inhibition of impulses.

To sum up, the narrow definition of self-control as the effortful inhibition of impulses is at odds with empirical evidence which shows that goal-achievement is not the product of attempting to inhibit temptations head-on. The situated model, in virtue of implying a broader

notion of self-control, avoids rejecting the importance of self-control for achieving goals. Another reason to reject the narrow definition of self-control arises from evidence that individuals who suffer from chronic failures of self-control, such as drug addicts, have brains that function in such a way that it is difficult for them to recruit the deliberative motivational system in moments of high stress, namely, when faced with the object of their addiction.

6.2 Impulsive brains

DMV posits that the deliberate motivational system will always be the one to conquer any impulsive action-desires, since self-control is a proprietary action belonging only to this type of system. With this control asymmetry in place, it is difficult to explain how individuals who experience chronic self-control failures, such as those suffering from impulse control disorders, can and do overcome strong impulses when attempting to kick their bad habits.

Impulse control disorders vary and include behavioral control problems such as obsessive compulsive disorder and post traumatic stress disorder. An incredibly common impulse control disorder is addiction. A statistical report published in 2015 reveals that 240 million people have an addiction to alcohol, over a billion people have an addiction to smoking, and about 15 million people are addicted to injection drugs (Gowing et al., 2015). That is over 1/7th of the global population at the time these statistics were gathered. The treatment for addiction, as for most impulse control disorders, is typically some sort of behavioral therapy, which essentially consists in training the deliberative motivational system to be stronger when agents face the objects of their various addictions. Every addict who undergoes cognitive behavioral therapy, for example, has a 40-60% chance of relapse (McLellan et al., 2000). These statistics and the continued prevalence of addictions are indicative of the ineffectiveness of such therapies for most individuals.

One study provides insight as to why these therapies tend to fail through the discovery of a "backdoor pathway" in the brain that processes cravings for drugs (Murray et al., 2015). This pathway completely circumvents the prefrontal cortex, thereby making the craving and subsequent drug seeking behavior unfold on a subconscious level. If the agent is not consciously aware that she is craving drugs or engaging in drug seeking behavior, then the deliberate motivational system cannot be recruited to fight the temptation. So, in the case of recovering addicts, how can we explain what happens for those who *are* successfully self-controlled when experiencing these strong subconscious impulses?

The most likely answer is that these agents recruited some sort of habit-based strategy. One example of such a strategy is training implementation intentions, which are conditional triggers that increase the likelihood of some behavior when this previously identified trigger is encountered (Gollwitzer & Sheeran, 2006). A recovering alcoholic, for instance, can form the intention to call her sponsor every time she finds herself in front of a tempting bottle of whiskey, so she habitually reaches for her phone instead of for the bottle when she starts craving the drink. Implementation intentions work akin to impulses, thus consciously aware regulation is not required. DMV is not equipped to explain such cases in a straightforward way, if at all, whereas he situated model can easily account for these instances.

DMV offers a very limited notion of self-control and, in turn, can only prescribe strategies that are ineffective and inefficient for the people that need them most, namely, those struggling with chronic failures of self-control. The success of a recovered addict is likely more attributed to training the right sorts of automatic responses, such as utilizing implementation intentions, rather than by getting lucky in terms of somehow gaining momentary access to the deliberate motivational system. When an addiction hijacks an individual's brain, perhaps the best strategy is not to try using the deliberate motivational system in vain (at least not at the beginning), but rather to fight impulsive habitual fire with impulsive habitual fire by training the right sorts of subconscious reactions that achieve the desired result.

7. Conclusion

Dual-process theories of self-control dominate the self-control literature. These views split the mind into two distinct processes and argue that self-control belongs exclusively to one of these processes: the slow and deliberate process. These views exclude the possibility of an instance of self-control being automatic and impulsive. This leads to a very narrow definition of self-control as the ability to inhibit impulses.

In this paper, I have raised several explanatory challenges for such views, using the Divided Mind view (Sripada, 2014) as the paradigm example of a dual-process theory of self-control. The Divided Mind view cannot account for the role that emotions can genuinely play in successful self-control, and this view will have a hard time accounting for the role that situated factors (i.e. the body, the immediate environment, and social networks) do play in successful self-control.

As an alternative to dual-process theories of self-control, I presented the situated model of self-control and argued that this model is superior to the dual-process theories because of the broader notion of self-control that this model implies. The virtue of adopting a broader notion of self-control is a practical one, in that doing so allows for much more flexibility and creativity in designing therapies and strategies to overcome the staggering levels of motivational opposition that we are faced with on a daily basis. While normal individuals have a hard enough time being self-controlled throughout their daily lives, the clinical population of people being diagnosed with impulse control disorders is steadily rising. Splitting the mind might seem like an attractive solution for the purpose of building an interesting theory, but putting the mind back together is a necessary practical solution for a very serious problem that persists in our everyday lives.

Works Cited

Agroskin, D., Klackl, J., & Jonas, E. (2014). The Self-Liking Brain: A VBM Study on the Structural Substrate of Self-Esteem. *PLoS ONE, 9,* 1-8.

Ali S. A., Begum T., & Reza F. (2018). Hormonal influences on cognitive function. *Malaysian Journal of Medical Science, 25,* 31–41.

Bayne, T., & Levy, N. (2006) The Feeling of Doing: Deconstructing the Phenomenology of Agency, in Sebanz, N., Prinz, W. (eds.) Disorders of Volition, Cambridge, MA: MIT Press, 49–68.

Brooks, H. L., Rushton, K., Lovell, K., Bee, P., Walker, L., Grant, L., & Rogers, A. (2018). The power of support from companion animals for people living with mental health problems: a systematic review and narrative synthesis of the evidence. *BMC Psychiatry, 18,* 1-12.

Burnette, J. L., O'Boyle, E. H., VanEpps, E. M., Pollack, J.M., & Finkel, E. J. (2013). Mind-sets matter: A meta-analytic review of implicit theories and self-regulation. *Psychological Bulletin, 139,* 655-701.

Carney, D. R., Cuddy, A. J. C., & Yap, A. J. (2010). Power Posing: Brief Nonverbal Displays Affect Neuroendocrine Levels and Risk Tolerance. *Psychological Science, 21,* 1363-1368.

Carney, D. R., Cuddy, A. J. C., & Yap, A. J. (2015). Review and Summary of Research on the Embodied Effects of Expansive (vs. Contractive) Nonverbal Displays. *Psychological Science, 26,* 657-663.

Casasanto, D., & Dijkstra, K. (2010). Motor Action and Emotional Memory. *Cognition, 115,* 179-185.

Celnik, P., Stefan, K., Hummel, F., Duque, J., Classen, J., & Cohen, L. G. (2006). Encoding a motor memory in the older adult by action observation. *Neuroimage, 29,* 677-684.

Churchland, P. (2012). *Braintrust: What Neuroscience Tells Us About Morality.* New Jersey: Princeton University Press.

Clark, A., & Chalmers, D. (1998). The extended mind. Analysis, 58, 7-19.

Colombetti & Roberts

Connor, T. D. (2013). Self-control, willpower and the problem of diminished motivation. *Philosophical Studies, 168,* 783-796.

Csikszentmihalyi, M. (1990) Flow: The Psychology of Optimal Experience. New York: Harper & Row.

Demirci, E., Özmen, S., & Öztop, D. B. (2016). Relationship between Impulsivity and Serum Oxytocin in Male Children and Adolescents with Attention-Deficit and Hyperactivity Disorder: A Preliminary Study. *Arch Neuropsychiatry, 53,* 291-295.

Duckworth, A. (2016). *Grit: Why Passion and Resilience are the Secrets to Success.* New York: Scribner/Simon & Schuster.

Duckworth, A. L., & Quinn, P. D. (2009). Development and Validation of the Short Grit Scale (Grit- S). *Journal of Personality Assessment, 91,* 166-174.

Dweck. C. (2017). *Mindset: Changing the Way You Think to Fulfill Your Potential.* London: Little, Brown Book Group.

Eisenberg, N., & Mussen, P. (1978). Empathy and moral development in adolescence. *Developmental Psychology, 14,* 185-186.

Elliot, A. J. (2015). Color and psychological functioning: a review of theoretical and empirical work. *Frontiers in Psychology, 6,* 1-8.

Evans, J. St. B. T. (2003). In two minds: dual-process accounts of reasoning. *Trends in Cognitive Sciences, 7,* 454-459.

Fernandes, V. R., Ribeiro, M. L. S., Melo, T., de Tarso Maciel-Pinheiro, P., Guimarães, T. T., Araújo N. B., Ribeiro, S., & Deslandes, A. C. (2016). Motor Coordination Correlates with Academic Achievement and Cognitive Functioning Children. *Frontiers in Psychology, 7,* 1-8.

Fujita, K. (2011). On Conceptualizing Self-Control as More Than the Effortful Inhibition of Impulses. *Personality and Social Psychology Review, 15,* 352-366.

Fujita, K., Carnevale, J. J., & Trope, Y. (2018). Understanding Self-Control as a Whole vs. Part Dynamic. *Neuroethics, 11,* 283–296.

Gamble, K. R., Howard, J. H., & Howard, D. V. (2014). Not Just Scenery: Viewing Nature Pictures Improves Executive Attention in Older Adults. *Experimental Aging Research, 40,* 513-530.

Gollwitzer, P. M., & Sheeran, P. (2006). Implementation Intentions and Goal Achievement: A Meta Analysis of Effects and Processes. *Advances in Experimental Social Psychology, 38,* 69-119.

Gowing, L. R., Ali, R. L., Allsop, S., Marsden, J., Turf, E. E., West, R., & Witton, J. (2015) Global statistics on addictive behaviours: 2014 status report. *Addiction, 110,* 904-919.

Hackman, D. A., Farah, M. J., & Meany, M. J. (2010). Socioeconomic status and the brain: mechanistic insights from human and animal research. *National Review of Neuroscience, 11,* 651–659.

Haidt, J. (2001). The Emotional Dog and Its Rational Tail: A Social Intuitionist Approach to Moral Judgment. *Psychological Review, 108,* 814-834.

Hardy, S. A. (2006). Identity, Reasoning, and Emotion: An Empirical Comparison of Three Sources of Moral Motivation. *Motivation and Emotion, 30,* 205-213.

Hoffman, M. L. (2001). *Empathy and Moral Development.* Cambridge: Cambridge University Press.

Holt-Lunstad, J., Birmingham, W., Jones, B.Q., (2008). Is There Something Unique about Marriage? The Relative Impact of Marital Status, Relationship Quality, and Network Social Support on Ambulatory Blood Pressure and Mental Health. *Annals of Behavioral Medicine, 35,* 239–244.

Holton, R. (2003). How is Strength of Will Possible? In S. Stroud & C. Tappolet (Eds.), *Weakness of Will and Practical Irrationality* (pp. 39-67). New York: Oxford University Press.

Hung, I., & Labroo, A. (2011). From Firm Muscles to Firm Willpower: Understanding the Role of Embodied Cognition in Self-Regulation. *Journal of Consumer Research, 37,* 1046 - 1064.

Kahneman, D. (2012). *Thinking, Fast and Slow.* New York: Farrar, Straus and Giroux.

Kennett, J., & Smith, M. (1996) Frog and Toad lose control. *Analysis, 56,* 63-73.

Leach, C. W., & Cidam, A. (2015). When is shame linked to constructive approach orientation? A meta-analysis. *Journal of Personality and Social Psychology, 109*, 983–1002.

Lewis, M. (2011). The Self-Conscious Emotions. *Encyclopedia on Early Childhood Developement.* http://www.child-encyclopedia.com/sites/default/files/textes-experts/en/638/the-self-conscious-emotions.pdf

Liu, X., Wang, L., & Liao, J. (2016). Enabling Delay of Gratification Behavior in Those Not So Predisposed: The Moderating Role of Social Support. *Frontiers in Psychology, 7,* 1-12.

McLellan, A. T., Lewis, D. C., O'Brien, C. P., & Kleber, H. D. (2000). Drug dependence, a chronic medical illness: implications for treatment, insurance, and outcomes evaluation. *JAMA, 284,* 1689–1695.

McMains, S., & Kastner, S. (2011). Interactions of top-down and bottom-up mechanisms in human visual cortex. *Journal of Neuroscience, 31,* 587-597.

Mele, A. R. (1992). Akrasia, Self-Control, and Second-Order Desires. *Noûs, 26,* 281-302.

Michaelson, L., de la Vega, A., Chatham, C. H., & Munakata, Y. (2013). Delaying gratification depends on social trust. Frontiers in Psychology, 4, 1-7.

Milyavskaya, M., & Inzlicht, M. (2017). What's So Great About Self-Control? Examining the Importance of Effortful Self-Control and Temptation in Predicting Real-Life Depletion and Goal Attainment. *Social Psychological and Personality Science, 8,* 603-611.

Murray, J. E., Belin-Rauscent, A., Simon, M., Giuliano, C., Benoit-Marand, M, Everitt, B. J., & Belin, D. (2015). Basolateral and central amygdala differentially recruit and maintain dorsolateral striatum-dependent cocaine-seeking habits. *Nature Communications, 6,* 1-9.

Newman, K. P., & Brucks, M. (2016). When are natural and urban environments restorative? The impact of environmental compatibility on self-control restoration. *Journal of Consumer Psychology, 26,* 1-7.

Patrick, V. M., Chun, H. H., & Macinnis, D. J. (2009). Affective forecasting and self-control: Why anticipating pride wins over anticipating shame in a self-regulation context. *Journal of Consumer Psychology, 19,* 537-545

Philippot, P. & Blairy, S. (2010). Respiratory feedback in the generation of emotion. *Cognition and Emotion, 5,* 605-627.

Plessow, F., Marengi, D. A., Perry, S. K., Felicione, J. M., Franklin, R., Holmes, T. M., Holsen, L. M., Makris, N., Deckersbach, T., & Lawson, E. A. (2018) Effects of Intranasal Oxytocin on the Blood Oxygenation Level-Dependent Signal in Food Motivation and Cognitive Control Pathways in Overweight and Obese Men. *Neuropsychopharmacology, 43,* 638-645.

Ryan, R. M. & Deci, E. L. (2000). Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being. *American Psychologist, 55,* 68-78.

Soutschek, A., Ruff C. C., Stromback, T., Kalenscher, T., & Tobler, P. N. (2016). Brain stimulation reveals crucial role of overcoming self-centeredness in self-control. *Science Advances, 2, 1-8.*

Soussigan, R. (2002). Duchenne Smile, Emotional Experience, and Autonomic Reactivity: A Test of the Facial Feedback Hypothesis. *Emotion, 2,* 52-74.

Sownndhararajan, K., & Kim, S. (2016). Influence of Fragrances on Human Psychophysiological Activity: With Special Reference to Human Electroencephalographic Response. *Science Pharmaceutica, 84,* 724-751.

Sripada, C. S. (2014). How is Willpower Possible? The Puzzle of Synchronic Self-Control and the Divided Mind. *Noûs, 48,* 41-74.

Stefan, K., Cohen, L. G., Duque, J., Mazzocchino, R., Celnik, P., Sawaki, L., Ungerleider, L., & Classen, J. (2005). Formation of a motor memory by action observation. *The Journal of Neuroscience, 25,* 9339-9346.

Stephan, A., Walter, S., & Wilutzky, W. (2014). Emotions beyond brain and body. *Philosophical Psychology, 27,* 65-81.

Strang, S., Hoeber, C., Uhl, O., Koletzko, B., Münte, T. F., Lehnert, H., Dolan, R. J., Schmid, S. M., & Park, S. Q. (2017). Impact of nutrition on social decision making. *PNAS, 114,* 6510-6514.

Tangney, J. P., Stuewig, J., & Mashek, D. J. (2007). Moral Emotions and Moral Behavior. *Annual Review of Psychology, 58,* 345-372.

Tracy, J. (2016). *Pride: The Secret of Success.* New York: Houghton Mifflin Harcourt.

Tuk, M. A., Trampe, D., & Warlop, L. (2011). Inhibitory Spillover: Increased Urination Urgency Facilitates Impulse Control in Unrelated Domains. *Psychological Science, 22,* 627-633.

Vandellen, M., Knowles, M. L., Krusemark, E., Sabet, R. F., Campbell, W. K., McDowell, J. E., & Clementz, B. A. (2012). Trait Self-esteem Moderates Decreases in Self-Control Following Rejection: An Information-processing Account. *European Journal of Personality, 26,* 123-132.

Veenstra, L., Schneider, I. K., & Koole, S. L. (2017). Embodied mood regulation: the impact of body posture on mood recovery, negative thoughts, and mood-congruent recall. *Cognition and Emotion, 31,* 1361-1376.

Vierkant, T. (2014). Is Willpower Just Another Way of Tying Oneself to the Mast? *Review of Philosophy and Psychology, 6,* 779-790.

Walter, S. (2014). Situated Cognition: A Field Guide to Some Open Conceptual and Ontological Issues. *Review of Philosophy and Psychology, 5,* 241-263.

Weir, K. (2012). *What You Need to Know About Willpower: The Psychological Science of Self-Control.* Retrieved from www.apa.org/helpcenter/willpower.pdf.

Zhao, D., Corsetti, M., Moeini-Jazani, M., Weltens, N., Tuk, M., Jan, T., Warlop, L, & Van Oudenhove, L. (2019). Defecatory urge increases cognitive control and intertemporal patience in healthy volunteers. *Neurogastroenterology & Motility, 31.*

Fighting Fire with Fiero: Using Pride to Overcome Self-Control Dilemmas

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Abstract

The self-control literature rarely treats emotions as a phenomenon that is useful for sticking with one's commitments and better judgments. Most self-control theorists categorize an emotion as a compelling force, which, at worst, must be avoided at all costs, and, at best, can be a mere influence. For those compelling emotions which can potentially be influential, only low-arousal emotions are typically accepted as useful for successful self-control. In light of a recent movement to conceive self-control as a situated phenomenon (Heath & Anderson, 2010; Hung & Labroo, 2011), the time has come to reconsider the role that emotions can (and do) play in self-control. Empathy, for example, has been associated with the ability to delay gratification (Soutschek et al., 2016). It is worthwhile to investigate potential candidates for a self-control emotion.

The aim of this paper is to argue that emotions deserve to be bona-fide members of the self-control system and that a species of pride may very well be considered a self-control emotion. More specifically, this paper will suggest that fiero - a version of pride that is experienced when an agent triumphs over a great challenge - can potentially be utilized as a strategy to overcome temptation in a self-control dilemma.

The physical expression of pride in general is innate (Tracy & Matsumoto, 2008), and fiero specifically works to motivate the desire to overcome additional challenges. Furthermore, empirical evidence suggests that fiero can potentially be induced by mimicking the behavioral markers of this emotion (i.e., clenched fists, raised arms, fierce face, etc.). Taken together, these observations indicate that inducing a feeling of fiero might be sufficient to motivate an agent to overcome some motivational opposition and be successfully self-controlled. The arguments in this paper represent a call to action for empirical researchers and philosophers to systematically investigate the role that emotions play in producing successful self-control.

"Victorious warriors win first and then go to war, while defeated warriors go to war first and then seek to win."

<div align="right">- Sun Tzu, The Art of War</div>

1. Introduction

Self-control is a highly reputed and coveted skill, as it allows an agent to regulate her own thoughts, emotions, and behaviors in order to achieve her deeply desired goals. In relation to this ability, emotion has been typically seen as a mere helpful but unnecessary influence for successful self-control at best, and as the arch nemesis of self-control at worst. However, contemporary emotions researchers are starting to emphasize the important role that emotions can genuinely play in producing successful self-control.

Empathy, for example, has been associated with an important component of self-control, namely, the ability to delay gratification (Soutscheck et al., 2016). Positive emotions comprising a good mood in general has also been linked with successful self-control (Tice, 2007). The current top candidate for being considered a self-control emotion is pride, since the feeling of pride both inspires us to create high-achievement goals for ourselves, as well as motivates the pursuit of those higher goals (Tracy, 2016). In this sense, the emotion that an agent feels after accomplishing a great challenge can be repurposed as a self-control strategy by being invoked before a challenge, thereby acting as a motivator to successfully achieve the task at hand. However, pride is a somewhat general emotion, whereas self-control is a specific behavior, so perhaps a more specific version of pride might be better suited as a self-control emotion.

In this paper, I will argue that a species of pride may very well be considered a self-control emotion. More specifically, this paper will suggest that fiero - a version of pride that is experienced when an agent triumphs over a great challenge - can potentially be utilized as a strategy to overcome temptation in a self-control dilemma. In order to do so, I will first clarify the notion of self-control, as well as introduce the situated model of goal-oriented behavior to act as an anchor for the arguments in the rest of the paper (section 2); next, I will present the evidence that pride in general is associated with self-control and describe fiero, a specific version of pride that can be potentially utilized in a strategy to fight wayward temptations (section 3); lastly, I will present both empirical and anecdotal evidence which suggests that fiero can be used to fight wayward temptations. Taken together, these arguments indicate that inducing a feeling of fiero might be sufficient to motivate an agent to overcome a wayward temptation and be successfully self-controlled. Moreover, these arguments highlight the need for further research to systematically investigate the role of emotions for producing successful self-control.

2. Self-Control

Self-control is the ability to regulate or manipulate one's own thoughts, emotions and behaviors. When goal-oriented behavior is thwarted by some sort of motivational challenge or opposition, self-control is the ability to fight this challenge and overcome the opposition in order to allow the goal-oriented behavior to persist.

In this section, I will describe self-control dilemmas, namely, situations where an agent's motivation to pursue her goals is threatened. I will then present the situated model of self-control, which portrays goal-oriented behavior as the byproduct of an interplay between an agent's physical and mental states, as this model will be the anchor for the arguments presented throughout the rest of the paper. Lastly, I will explain the role that perceptions play in generating successful self-control in the form of overcoming these dilemmas in order to set the stage for introducing the role of emotions in successful self-control.

2.1 Self-control dilemmas

There are two types of self-control: diachronic and synchronic. Diachronic self-control refers to strategies that are initiated before any threat to one's goals is experiences (e.g. throwing out all smoking paraphernalia when deciding to quit cigarettes, before the temptation to smoke a cigarette even arises), whereas an instance of synchronic self-control involves deploying strategies to fight a direct threat to one's goals (e.g. declining a cigarette from a friend at a party, despite craving to smoke). Temptation to pursue some contrary intention is often considered the most common threat to one's goals.[26] Examples of goal-threatening temptations include chocolate cakes for dieters, cigarette puffs for health-conscious quitters, comfy couches for the shamefully obese, attractive coworkers for monogamous relationships, and wild parties for assignment deadlines. Explaining how synchronic self-control in the face of temptation is possible in certainly one of the most popular investigations within the self-control literature, and this paper will follow suit in that the rest of the arguments presented will focus specifically on the synchronic form of self-control, with temptation as the paradigm example of a threat to goals.

In a self-control dilemma, where an agent experiences a threat to her goal(s), she is essentially undergoing a case of cognitive dissonance. This phenomenon occurs when an agent holds two or more contradictory or inconsistent beliefs, desires, or judgments. For a case of cognitive dissonance to truly qualify as a self-control dilemma, the motivational saliency or strength of the goal has to approximately be within the same range of intensity as the motivational saliency or strength of the contrary temptation. The dilemma, in other words, is marked by this confusion or indecisiveness of what to do next, or which goal to pursue (i.e. the original one, or the wayward desire), because both have a strong motivational pull. When the agent finally acts, and that action in pursuit of the original goal, then she is successfully self-controlled. However, if the agent's action is in pursuit of the temptation, then she is weak-willed.

Another way to conceive of the dilemma is that the agent who is experiencing it is engaged in an internal *competition*, where some goal that she holds and some contrary temptation that she feels are in *battle* with one another, and that overcoming the temptation is seen as a great *challenge*. This way of conceiving a self-control dilemma as a great challenge works to better frame the specific role that perception clearly plays in successfully achieving one's own goals.

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[26] Other examples of threats to goals is diminished motivation, such as laziness and lethargy (Connor, 2012) and procrastination (Heath & Anderson, 2010).

2.2 The situated model of goal-oriented behavior

The situated model of goal-oriented behavior is designed to capture how goal-oriented behavior is produced based on empirical evidence that reveals the importance of perceptions, emotions, and situated factors (i.e. the body, the immediate environment, and social networks) for such behavior.[27] The model depicts several elements that are responsible for producing goal-oriented behavior, and a malfunction in one or more of these elements disrupts the corresponding behavior. The situated model of goal-oriented behavior depicts a system of elements that must function in interrelated harmony in order to produce the appropriate behavior. Below is a figure of this system-based model.

The Situated Model of Goal-Oriented Behavior
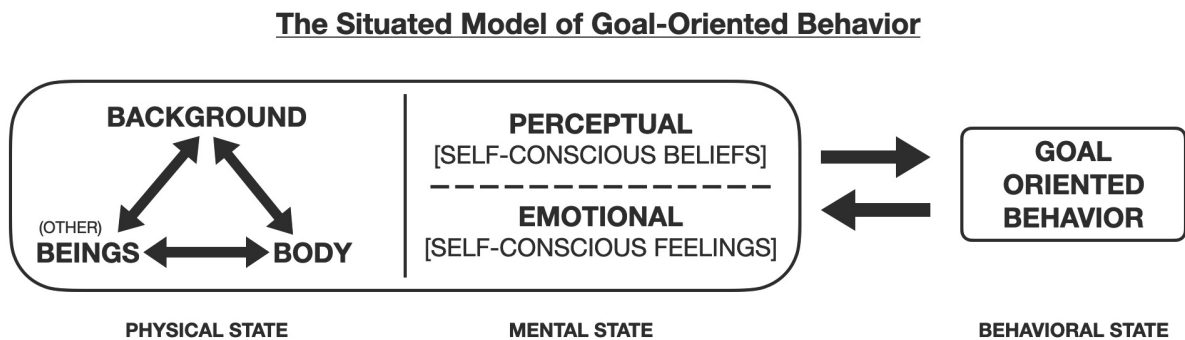
Self-control consists in regulating one's own thoughts, emotions, and behaviors, but this model adds regulating one's own physical state to that list. In manipulating any of the elements responsible for goal-oriented behavior in a way that allows the behavior to be performed despite the temptation to do otherwise, an agent can be said to be self-controlled. The model, therefore, identifies several potential sources of self-control. The traditional conception of self-control involves manipulating one's own perceptions or emotions in order to achieve the desired behavior. However, according to this model, another strategy available to the agent is to manipulate her own physical state in the relevant ways in order to achieve the desired behavior. Manipulating the physical state results in changes within the mental state, which, in turn, affects the corresponding behavioral state. In this sense, the mental state acts as a sort of bridge between the physical state and the behavioral state.

The physical state of the agent involves three factors: the body, the background (i.e. the agent's immediate environment), and (other) beings (i.e. the agent's social networks). The mental state of the agent has two dimensions: the perceptual and the emotional. The following section explains the perceptual dimension that matters for goal-oriented behavior.

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[27] I will not present the empirical evidence which supports the model in this section. This evidence will be presented throughout the paper in following sections.

2.3 Perceptions matter for successful self-control

One of the most well accepted and uncontroversial assumptions within most, if not all, theories of self-control is that perceptions matter. More specifically, the kinds of perceptions that enter an agent's consciousness can make or break successful self-control in any given dilemma. The perceptions that play a vital role in producing successful self-control involve beliefs about the self.

The Self-Determination Theory (Ryan & Deci, 2000) is built upon a large body of empirical evidence that demonstrates the crucial importance of an agent perceiving herself as both autonomous and competent in order to be self-motivated.[28] Similarly, subjectively perceiving one's own strength (Hiemstra & Yperen, 2015) and one's own resilience (Jones & Tanner, 2016) have been linked with increased self-regulation. Grit, which is defined as the combination of perseverance and passion, is a reliable indicator of achievement in a variety of different domains, including academic and non-academic (Duckworth, 2016). Perceiving the flexibility of one's own strength by having the implicit belief that one's self-control can increase with practice (or decrease with lack thereof) has been implicated in successful goal-achievement (Burnette et al, 2013; Dweck, 2017). On a more general note, it has been repeatedly argued that self-esteem is highly important for successful self-motivation (Agroskin et al., 2014; Vandellen et al., 2012).

One noticeable similarity amongst these beliefs that cause self-control is that, taken together, they are the same beliefs that a person who has a deep sense of pride perceives about herself. A genuinely proud person is one who is very likely to often perceive herself as autonomous, competent, strong, resilient, gritty, and flexible, as well as generally maintain pretty high levels of self-esteem. The following section reviews some empirical evidence that supports the argument that (authentic) pride is a precursor to goal-oriented behavior, and makes a finer grained distinction of a specific species of pride that can be utilized to overcome a self-control dilemma.

3. Identifying a Self-Control Emotion

The emotional dimension of the situated model of goal-oriented behavior reflects the perceptual dimension. Since the perceptual dimension involves self-conscious beliefs, that is, beliefs about the self such as one's own autonomy and competence, the emotional dimension involves self-conscious emotions. Self-conscious emotions arise in response to reflecting upon the self; there are several self-conscious emotions, including pride, hubris, shame, embarrassment, jealousy, and guilt (Lewis, 2011). Pride is perhaps the best candidate from this list to be considered as a self-control emotion.

The point that a (genuinely) proud agent is much more likely to be successfully self-controlled is by no means a new or original claim. Contemporary emotions theorists have already

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[28] The Self-Determination Theory also argues that relatedness is important for self-motivation, however the authors acknowledge that there is significantly more empirical evidence to support autonomy and competence as the perceptions that increase self-motivation, with less evidence supporting relatedness.

formulated arguments regarding the role that pride plays in motivating goal-oriented behavior. However, when it comes to being self-controlled in the face of a strong temptation, a specific species of pride called fiero might be a more appropriately fitting motivator to overcome this self-control dilemma than just a general sense of pride.

In this section, I will briefly outline the evolution of the argument that pride is, in essence, the emotion that motivates goal-oriented behavior. I will then introduce fiero and explain how fiero is a more apt fit for motivating specifically *synchronic* self-control.

3.1 Pride as motivation for goal-directed behavior

Aristotle was the first known philosopher to argue that pride motivates high achievement behavior, as he insightfully points our that a "person is proud if he both is and thinks himself to be worthy of great things… in sum, pride is a crown of the virtues; it is not found without them, and it makes them greater" (Nichomachean Ethics, Book IV). This emotion, according to Aristotle, has two elements: it is *reactive,* in that an agent feels proud when she has accumulated the virtues and is worthy of great things, but it is also *proactive*, in the sense that pride motivates the further cultivation and maintenance of virtue.[29]

The idea that pride, or any emotion, has the regulatory capacity[30] to manipulate other thoughts, emotions, and behaviors has been fairly dormant within the self-control literature until relatively recent years. Pride has been largely considered as a sin and a vice, until authentic pride has been explicitly distinguished from hubristic pride, that is, an instance of faking pride in order to compensate for or cover up some perceived deficiencies within oneself (Tracy, 2016). In contemporary debates, any researcher working on pride agrees that authentic or genuine pride is directly linked to self-control and goal-achievement (Carver et al., 2010; Tracy; 2016), with many theorists arguing that goal-achievement[31] isn't even an intelligible behavior without the existence of pride (Tracy, 2016).

Another important feature of pride is that there is considerable evidence to support the claim that this is a biologically innate emotion, one that is universally shared. The feeling of pride, for example, is expressed through a particular facial expression (Shiota et al., 2003). Similarly, the feeling of pride is also expressed through a particular body posture and certain characteristic movements, which are expressed even by congenitally blind people, as observed in winners of Olympic competitions featuring blind competitors (Tracy and Matsumoto, 2008). It is difficult to deny that feeling pride and feeling motivated to achieve one's goals are related, however it is likely the case that not pride, but rather a specific version of pride, called fiero, is a more suitable candidate to be considered a "self-control emotion" that motivates goal-oriented behavior in the face of a temptation to do otherwise.

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[29] Aristotle's view on pride doesn't do any work for the arguments in this paper other than being an inspirational starting point.

[30] The term "regulatory capacity" is meant to imply a contrast with "coercive capacity"

[31] Goal-achievement here refers to "higher" intrinsic goals, such as to be kind, self-disciplined, or to end world hunger, rather than extrinsic goals such as satisfying hunger or thirst.

3.2 Fiero

Fiero is a term first coined by Italian psychologist Isabella Poggi, but this emotion hasn't been catalogued in detail until Paul Ekman (2007), one of the leading psychologists in emotional expression, decided to include a description of fiero while explaining the different varieties of positive emotions that humans can experience. According to Ekman, an agent feels fiero when she "has stretched to accomplish something difficult and the feeling about having done so and succeeded is very enjoyable and quite unique" (2007, p.196). The main difference between pride and fiero, therefore, is that pride is felt in response to achievement in general, whereas fiero is a response to a specific kind of achievement, one that was accomplished *despite an extreme and vigorous challenge.*

Fiero can be observed most commonly within competitive arenas (e.g. the Olympics, sports matches, and video games), however the competition does not have to be public, in that fiero can be felt when one has privately overcome a challenging obstacle, such as when a student completes an arduous and difficult essay while home by herself (Ekman, 2007). Similarly to pride, fiero can be both reactive and proactive. This emotion is reactive, in the sense that it arises as a response to perceiving oneself as having achieved some great and difficult accomplishment. The reaction typically is expressed the moment that the challenge is over (e.g. the moment the first place runner crosses the finish line). Fiero also has the potential to be proactive, meaning that fiero has the capacity to motivate future accomplishment as well (McGonigal, 2011). When a tennis player feels fiero, for example, after defeating the final opponent in Wimbledon (one of the most prestigious tennis tournaments worldwide), it shouldn't be controversial to presume that she feels as if she can accomplish anything, at least for the duration of her "winner's high". In fact, people often feel the need to "pump up" when preparing to perform in some way, such as delivering an important presentation at work, and it is very likely that the state which "pumping up" is intended to create is indeed a feeling of fiero.

The physical expression of fiero is quite specific. In its most extreme expression, fiero is marked by a wide open posture, arms typically raised above one's head and hands balled up into fists; the facial expression that accompanies this emotion is often an interesting blend of furrowed eyebrows, which usually acts as an indicator of certain negative emotions (e.g. anger or disgust), and a wide, genuine smile, which is the classic signal of positive emotion (e.g. joy or excitement). Furthermore, there is often a characteristic vocalization included in this expression, usually in the form of controlled yelling, cheering, whooping, or simply screaming "yes" repeatedly. The intensity of this emotion is usually very high, as most individuals who experience fiero do not remain stationary and instead move around rapidly, often jumping up and down or even engaging in a "victory dance". Interestingly, this characteristic movement tends to emphasize the other physical markers of expanded body posture, arms up and out, hands clenched, etc. that comprise the physical expression of fiero.

Considering that self-control dilemmas as essentially competitions between an agent's goals and some temptation to do otherwise (e.g. stay on a diet and eat some chocolate cake), as proposed at the end of section 2.1, proactive fiero has significantly high potential for motivating successful self-control. The following section reviews some empirical evidence that bolsters the

suggestion that fiero has the potential to significantly increase the likelihood of successful self-control.

4. Evidence of Fiero Motivating Successful Self-Control

Thus far, it has been argued that fiero can *theoretically* function as a self-control emotion by acting as motivation when one's goals are competing with some temptation. However, there is also some empirical evidence to support the claim that fiero can actually function as a self-control emotion.

In this section, I will break down the physical expression of fiero into five major components, and offer empirical evidence which suggests that each of these physical expression components either directly promotes goal-oriented behavior, or creates the kinds of relevant perceptions that produce successful self-control. I will also raise two interesting real-life examples of the fiero expression preceding great achievements: one example involves the All Blacks, New Zealand's rugby team, and the other example includes the Maori warriors, an indigenous group also hailing from New Zealand.

4.1 Empirical evidence of fiero motivating self-control

The physical expression of fiero has been outlined in detail in section 3.2, but the general expression can be broken down into five distinct components: (1) expanded body posture, (2) clenched fists, (3) "fierce" facial expression (i.e. furrowed brows with smile), (4) specific patterns of vocalizations and breathing, and (5) movement. While there are no experiments which investigate the impact that the expression of fiero as a whole has on self-motivated behavior and goal-achievement, there have been studies independently conducted on each of the five distinct components that comprise this expression.

The effects of an expanded posture on an agent's self-image and behavior has been a hot topic of debate for a few years now. Expanded posture includes straightening one's spine and pushing one's shoulders back in order to open up the chest, while a slouched posture involves a bend of either the upper spine (near the shoulder blades) or the lower spine (right above the hips), or both, and thus involves collapsing the chest cavity inwards. An expanded posture has been shown to increase confidence and perhaps even directly affect cortisol levels, which regulate our stress response, although the latter has been a somewhat controversial finding (Carney et al., 2010; 2015). Importantly, it has been shown that it is indeed the physical posture itself that matters more than the assumed subjective power role that typically accompanies the posture (Huang et al., 2011). On a similar note, actual achievement elicited a stronger sense of pride when agents were standing upright when receiving the news of their victory (Stepper & Strack, 1993). Expanded posture has also been implicated in the ability to recover faster from negative experiences (Veenstra et al., 2017). These types of studies reveal the important role of a straight and expanded posture on both achievement-based behavior, as well as the subjective perceptions of one's own achievements.

Clenched fists, or clenched muscles in general, have been demonstrated to significantly increase self-control in a variety of different domains (Hung & Labroo, 2011). A series of four

experiments reveal that clenched fists, or calf muscles, increase the capacity of participants to attend to unpleasant stimuli, persevere through physical pain, withstand drinking a disgusting "health drink", and make healthier food choices at a snack bar.

The evidence that supports the effects of a "fierce" facial expression (i.e. furrowed brows with smile) are admittedly much more speculative. However, there is some pretty clear evidence that both smiles and furrowed brows have an impact on the kinds of emotions that an agent experiences. A genuine smile, for example, has been demonstrated to increase a positive state of mind (Soussignan, 2002). When an agent smiles during a self-control dilemma, the corresponding positive state of mind might act as a reinforcer of a positive appraisal of one's own power. Similarly, studies corroborate that furrowed brows are expressive of negative emotions (e.g. anger), and that furrowing one's brows can also induce a negative state of mind (Larsen et al., 1992; Duclos & Laird, 2001). It is more difficult, however, to imagine the function of negative emotion for successful self-control. To give a purely intuitive answer, I imagine that the role which negative emotions play in promoting successful self-control is in directing a negative appraisal towards the opponent, which, in the case of self-control dilemmas, is the object of temptation. In other words, when one is frowning at one's competitor, there is a sense of anger or disgust (or perhaps a mix of the two) being directed at the opponent, thus motivating the agent to "get rid of" the source of those negative emotions by winning this competition. Again, this is merely a suspicion, but the main point is that this is an interesting and important avenue of investigation for scientists who are interested in uncovering the specific roles that emotions, whether negative or positive, play in successful self-control.

Vocalization and breathing, two related processes, have also been established as playing a role in producing certain physiological and cognitive states associated with successful self-control. Vocalizing at a particular rhythmic beat, such as when reciting yoga mantras or prayers like the Ava Maria, stabilizes heartbeat, blood pressure, and breathing patterns, and induces the corresponding relaxed and focused cognitive states (Bernardi et al., 2001). Breathing alone, without audible vocalization, appears to be directly linked to certain emotional state; more specifically, at least four distinct breathing patterns have been identified to correspond with anger, sadness, fear, and joy, where each emotion is expressed by its particular breathing pattern, but also adopting the particular breathing pattern arouses the corresponding emotion (Philippot & Blairy, 2010). In a different context, a study has found that university students who were explicitly instructed to chew gum for the duration of two weeks were more successful than their non-gum-chewing counterparts, in that the gum chewers got more academic work done during those two weeks (Smith & Woods, 2012). Since both chewing and vocalization require jaw movements, perhaps the same mechanisms that produce goal-achievement motivation for gum chewers is in play for audible vocalization.

The last component of the fiero expression is movement. Since fiero is a very arousing and high intensity emotion, there is often a surge of energy that accompanies this emotion, thus many expressions of fiero involve jumping up and down, or resemble a "victory dance". Movement also has important effects on both cognitive states and behaviors. Upwards motion, for example, is associated with being able to better perceive positivity, whereas downwards motions are implicitly associated with negativity (Casasanto & Dijkstra, 2010). Considering that part of the fiero expression is arms outstretched above one's head, it is likely that this upwards

motion has some relationship with the positive state of mind. More straightforward research reveals that motor movement directly affects academic achievement, as well as cognitive function, in children, to the point where academic achievement can be reliably predicted by observing a child's engagement in motor movement (Fernandes et al., 2016).

In sum, the studies cited in this section collectively make the case that each of the components of the physical expression of fiero has the power to strongly impact goal-oriented states of mind and the relevant goal-pursuing behaviors. The following sections shares some anecdotal evidence of expressions of fiero observed in real life as a precursor to overcoming great challenges.

4.2 Anecdotal evidence of fiero motivating self-control

There exist at least two related real life examples of the entire expression of fiero, utilizing all five main components, preceding great achievement in some sort of challenging physical competition.

The first of the two examples is of the All Blacks, which is the New Zealand national rugby team. The All Blacks are particularly famous for two reasons. First of all, this rugby team is highly successful in comparison to their competitors. The All Blacks are the most consistently top ranked team, having have held the number one rank of professional rugby teams worldwide for approximately 85% of the time that the ranking system has existed. They are the only rugby team in the history of the Rugby World Cup to win three times, and the only rugby team to be defending champions of the Rugby World Cup (they had two consecutive wins in 2011 and 2015). 1999 was the only year of the Rugby World Cup competition in which they did not finish in the top three. These major achievements have spanned over three decades. Overall, it is fairly safe to say that the All Blacks are a highly impressive team when it comes to their achievements in the world of professional rugby. The All Blacks' second claim to fame is that the team performs a dance known as the Haka before almost every game. The Haka is comprised of very forceful, strong, and rigidly rhythmic movements, along with chanting and aggressive vocalization. The Haka is also incredibly reminiscent of the physical expression of fiero, utilizing all five components of the fiero expression outlined in section 4.1.

The Haka is a dance first used by the Maori warriors of New Zealand, used for many rituals, but perhaps most famously the dance was performed before going to war. The Maori warriors were known for their fierce battles and their consistent victories. These soldiers were highly motivated during the battles, advancing and attacking their opponents head-on with no fear. The Maori were also known for certain post-war activities in which they would engage, which arguable requires a lot of self-motivation: they would shrink the heads of their fallen victims, eat the flesh of the fallen leaders of their opposition, and carve their faces as a testament of their victories.

This is very circumstantial evidence, and the correlation between the Haka and the subsequent achievements should not be mistaken for causation. However, taking into account the consideration of the empirical evidence presented in section 4.2, in conjunction with the observation that performing the Haka is a habit for these highly successful groups (i.e. the All

Blacks and the Maori warriors), compels an intriguing hypothesis that deserves attention and further empirical testing.

5. Conclusion

This paper engages with the debate of the role that pride plays in motivating goal-oriented behavior and essentially working to produce successful self-control in the face of threats. While pride is the current top contender for consideration as a self-control emotion, granting that such an emotion does exist, there is reason to suspect that pride by itself is too general to be a self-control emotion. Instead, it has been argued that a specific version of pride, fiero, is a more suitable candidate to be a self-control emotion. The main reason is that fiero is a reaction to specifically achieving some difficult goal in the face of a great challenge, but also has the power to be proactive by motivating goal-achievement, even in the face of great challenge. Similarly, self-control is nothing more than motivating goal-achievement, even in the face of great challenge (e.g. a strong and vivid temptation to do otherwise).

Even though the arguments made in this paper are highly circumstantial, in that they depend heavily on the assumption that emotions are even capable of genuinely participating in successful self-control, this suggestion nevertheless has significant practical import. Suggesting that fiero is the self-control emotion and that an agent can utilize this emotion to increase the likelihood of successful self-control by embodying the physical expression of fiero opens up the possibility for empirical testing. Future research is needed to test this model, and the underlying goal of this paper is to explain why such research is needed and that such an investigation would be worthwhile.

More importantly, suggesting that embodying an emotion has the capacity to improve self-control also opens up a whole new avenue of therapy design aimed at overcoming habitually consistent self-control dilemmas, such as treating drug addiction. While most other therapies focus solely on fighting those vividly hot temptations with cool and calm thoughts, the suggestion here is that another perfectly viable strategy is simply to fight fire with fiero.

Works Cited

Agroskin, D., Klackl, J., & Jonas, E. (2014). The Self-Liking Brain: A VBM Study on the Structural Substrate of Self-Esteem. *PLoS ONE, 9,* 1-8.

Bernardi, L., Sleight, P., Bandinelli, G., Cencetti, S., Fattorini, L., Wdowczyc-Szulc, J., & Lagi, A. (2001). Effect of rosary prayer and yoga mantras on autonomic cardiovascular rhythms: comparative study. *BMJ, 323,* 1446-1449.

Burnette, J. L., O'Boyle, E. H., VanEpps, E. M., Pollack, J.M., & Finkel, E. J. (2013). Mind-sets matter: A meta-analytic review of implicit theories and self-regulation. *Psychological Bulletin, 139,* 655-701.

Carney, D. R., Cuddy, A. J. C., & Yap, A. J. (2010). Power Posing: Brief Nonverbal Displays Affect Neuroendocrine Levels and Risk Tolerance. *Psychological Science, 21,* 1363-1368.

Carney, D. R., Cuddy, A. J. C., & Yap, A. J. (2015). Review and Summary of Research on the Embodied Effects of Expansive (vs. Contractive) Nonverbal Displays. *Psychological Science, 26,* 657-663.

Carver, C. S., Sinclair, S., & Johnson, S. L. (2010). Authentic and hubristic pride: Differential relations to aspects of goal regulation, affect, and self-control. *Journal of Research in Personality, 44, 698*-703.

Casasanto, D., & Dijkstra, K. (2010). Motor Action and Emotional Memory. *Cognition, 115,* 179-185.

Connor, T. D. (2013). Self-control, willpower and the problem of diminished motivation. *Philosophical Studies, 168,* 783-796.

Duckworth, A. (2016). *Grit: Why Passion and Resilience are the Secrets to Success.* New York: Scribner/Simon & Schuster.

Duclos S. E., & Laird, J. D. (2001). The deliberate control of emotional experience through control of expressions. *Cognition and Emotion, 15,* 27-56.

Dweck. C. (2017). *Mindset: Changing the Way You Think to Fulfill Your Potential.* London: Little, Brown Book Group.

Ekman, Paul. (2007). Emotions Revealed: Recognizing Faces and Feelings to Improve Communication and Emotional Life. New York: Henry Holt.

Fernandes, V. R., Ribeiro, M. L. S., Melo, T., de Tarso Maciel-Pinheiro, P., Guimarães, T. T., Araújo N. B., Ribeiro, S., & Deslandes, A. C. (2016). Motor Coordination Correlates with Academic Achievement and Cognitive Functioning Children. *Frontiers in Psychology, 7,* 1-8.

Heath, J., & Anderson, J. (2010). Procrastination and the Extended Will. In C. Andreou & M. White (eds.), *The Thief of Time: Philosophical Essays on Procrastination* (pp. 233-252). New York: Oxford University Press.

Hiemstra, D., & Yperen, N. W. V. (2015). The effects of strength-based versus deficit-based self-regulated learning strategies on students' effort intentions. *Motivation and Emotion, 39, 656-668.*

Huang, L., Galinsky, A. D., Gruenfeld, D. H., & Guillory, L. E. (2011). Powerful Postures Versus Powerful Roles: Which is the Proximate Correlate of Thought and Behavior? *Psychological Science, 22,* 95-102.

Hung, I., & Labroo, A. (2011). From Firm Muscles to Firm Willpower: Understanding the Role

of Embodied Cognition in Self-Regulation. *Journal of Consumer Research, 37,* 1046 - 1064.

Jones, L. & Tanner, T. (2016). Measuring 'Subjective Resilience'. *Overseas Development Institute.* https://www.odi.org/publications/9631-measuring-subjective-resilience-using-peoples-perceptions-quantify-household-resilience

Larsen, R. J., Kasimatis, M., & Frey, K. (1992). Facilitating the furrowed brow: An unobtrusive test of the facial feedback hypothesis applied to unpleasant affect. *Cognition and Emotion, 6,* 321–338.

Lewis, M. (2011). The Self-Conscious Emotions. *Encyclopedia on Early Childhood Developement.* http://www.child-encyclopedia.com/sites/default/files/textes-experts/en/638/the-self-conscious-emotions.pdf

McGonigal, J. (2011). Reality Is Broken: Why Games Make Us Better and How They Can Change the World. London: Jonathan Cape.

Philippot, P. & Blairy, S. (2010). Respiratory feedback in the generation of emotion. *Cognition and Emotion, 5,* 605-627.

Ryan, R. M. & Deci, E. L. (2000). Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being. *American Psychologist, 55,* 68-78.

Shiota, M. N., Campos, B., &Keltner, D. (2003). The faces of positive emotion: prototype displays of awe, amusement, and pride. *Ann N Y Acad Sci., 1000,* 296–299.

Smith, A. P., & Woods, M. (2012). Effects of chewing gum on the stress and work of university students. *Appetite, 58,* 1037-1040.

Soutschek, A., Ruff C. C., Stromback, T., Kalenscher, T., & Tobler, P. N. (2016). Brain stimulation reveals crucial role of overcoming self-centeredness in self-control. *Science Advances, 2, 1-8.*

Soussigan, R. (2002). Duchenne Smile, Emotional Experience, and Autonomic Reactivity: A Test of the Facial Feedback Hypothesis. *Emotion, 2,* 52-74.

Stepper, S., & Strack, F. (1993). Proprioceptive determinants of emotional and nonemotional feelings. *Journal of Personality and Social Psychology, 64,* 211–220.

Tice, D. M., Baumeister, R. F., Shmueli, D., & Muraven, M. (2007). Restoring the self: Positive affect helps improve self-regulation following ego depletion. *Journal of Experimental Social Psychology, 43,* 379–384.

Tracy, J. (2016). *Pride: The Secret of Success.* New York: Houghton Mifflin Harcourt.

Tracy, J. & Matsumoto, D. (2008). The spontaneous expression of pride and shame: evidence for biologically innate nonverbal displays. *Proceedings of the National Academy of Sciences, 105,* 11655-11660.

Vandellen, M., Knowles, M. L., Krusemark, E., Sabet, R. F., Campbell, W. K., McDowell, J. E., & Clementz, B. A. (2012). Trait Self-esteem Moderates Decreases in Self-Control Following Rejection: An Information-processing Account. *European Journal of Personality, 26,* 123-132.

Veenstra, L., Schneider, I. K., & Koole, S. L. (2017). Embodied mood regulation: the impact of body posture on mood recovery, negative thoughts, and mood-congruent recall. *Cognition and Emotion, 31,* 1361-1376.

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