

Annual Review of Criminology

Self-Control and Crime: Beyond Gottfredson & Hirschi's Theory

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Annu. Rev. Criminol. 2020. 3:43–73

First published as a Review in Advance on
October 4, 2019

The *Annual Review of Criminology* is online at
criminol.annualreviews.org

<https://doi.org/10.1146/annurev-criminol-011419-041344>

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Keywords

self-control, impulsivity, dual-influence model, control motivation, adolescent imbalance model, time perspective

Abstract

Over the past several decades, Gottfredson & Hirschi's self-control theory (SCT) has dominated research on self-control and crime. In this review, I assess the current state of self-control knowledge and encourage the field to move beyond SCT, as its peculiar conceptualization of self-control and the causal model present challenges for integrative scholarship. Drawing heavily on scholarship outside criminology, I clarify the definition of self-control; describe the malleable nature of trait self-control; highlight its situational variability as state self-control; and consider the multiplicity of contextual, situational, and individual factors that affect its operation in relation to crime. This specification of contingencies and the interplay between impulse strength and control efforts in the process of self-control is intended as a springboard for research moving beyond SCT and its key premise that self-control (ability) is sufficient to explain individual variation in crime (i.e., is tantamount to criminality). Finally, I address what I see as important areas for further study in light of current knowledge.

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INTRODUCTION

Nearly 30 years ago, Gottfredson & Hirschi (G&H) published their self-control theory (SCT) in *A General Theory of Crime* (1990). Although not the first to focus on the role of internal controls in crime causation (e.g., Nye 1958, Reiss 1951) or highlight the role of self-control on behavior (e.g., Ainslie 1975, Logue 1988, Mischel et al. 1989, Rachlin 1974), G&H elevated the concept of self-control to the forefront of criminological thought and stimulated an extraordinary and sustained amount of research on self-control and crime. For illustration, *A General Theory of Crime* was the most widely cited work in the top 20 criminology journals in the first five years following its publication (Cohn & Farrington 1999). By the end of 2011, the book had been cited roughly 4,500 times (Google Scholar), and this count more than doubled to 12,000 cites by the end of 2018 (Google Scholar). Hundreds of studies have explicitly tested elements of SCT, reporting widespread support for its central claim—that low self-control is a major cause of crime. This work has been covered in several authoritative reviews (Burt 2015, Goode 2008, Hay & Meldrum 2016), quantitative effect sizes have been estimated in meta-analyses (Pratt & Cullen 2000, Vazsonyi et al. 2017), and nary a month goes by without another published test of the theory. Self-control is widely, and largely uncontroversially, considered to be one of the strongest known correlates of crime,¹ a claim invariably referencing G&H's text, now a criminological classic.

Indisputably, G&H's theory has significantly contributed to the advancement of criminological knowledge. Yet the success, even dominance, of SCT in criminology has tethered the field to a unique conception of self-control and the causal model of its operation. Within criminology, SCT has gained a near monopoly on the concept of self-control, such that almost everything associated with self-control and crime is seen as falling under the purview of SCT. However, the past 30 years has also seen an explosion of research on self-control in other disciplines. This work has illuminated the multifaceted and dynamic nature of self-control processes as well as their developmental precursors and neurobiological underpinnings (e.g., Casey 2015; Hofmann et al. 2012; Steinberg et al. 2008; Vohs & Baumeister 2004, 2016). Unfortunately, the integration of these findings into criminology has been hindered by the field's allegiance to SCT, including its theoretical assumptions, peculiar conception of self-control, and explanatory propositions, some of which have been clearly contradicted by empirical evidence. With the aim of overcoming impediments to scientific integration and advancing theorizing on self-control in criminology, this review assesses the current state of self-control knowledge and encourages the field to move beyond SCT. Moving beyond SCT will enhance our ability to explain for whom, when, and how self-control is related to crime.

With this aim, this review proceeds as follows. First, I briefly describe SCT and discuss (primarily criminological) research assessing the theory. Recognizing the existence of thorough reviews, I cover this voluminous scholarship relatively concisely, identifying key themes and referencing emblematic pieces. My focus is explicitly critical rather than laudatory, evaluating the empirical validity of SCT and detailing its explanatory limitations. Next, I turn to conceptual issues that present challenges to integration by confronting the conceptual clutter (Morrison & Grammer 2016), or the so-called jingle-jangle problem (Block 1995, Kelley 1927) around self-control concepts. I propose relabeling G&H's key construct and the adoption of a widely shared definition of self-control as the effortful inhibition of an impulse for immediate gratification in the service

¹Scholars have argued, for example, that low self-control is one of the best, strongest, and most reliable predictors of criminal and delinquent behaviors (e.g., Antonaccio & Tittle 2008, Pratt & Cullen 2000); "its relationship to delinquent involvement is a 'fact' for which extant theories must take account" (Unnever et al. 2003, p. 483); and "future research omitting self-control from its empirical analysis risks being misspecified" (Pratt & Cullen 2000, p. 952).

of long-term, higher-order goals (e.g., Duckworth & Steinberg 2015). In this view, self-control is a specific type of self-regulation involving a complex interplay of situational stimuli and individual dispositions. This reconceptualization requires uprooting empirically invalidated assumptions underlying SCT and replacing these untenable assumptions with insights from elaborated dual-influence models (e.g., Duckworth & Steinberg 2015, Metcalfe & Mischel 1999). Drawing primarily on scholarship outside criminology, I describe the relatively stable, yet malleable, nature of trait self-control; highlight its situational variability as state self-control; and consider the multiplicity of contextual, situational, and individual factors that affect the operation of self-control as it relates to crime. This specification of contingencies and motivational factors in the operation of self-control is intended as a jumping-off point for research moving beyond SCT and its key premise that self-control ability is sufficient for explaining criminality. Finally, I address what I see as important areas for further study in light of current knowledge. Given space constraints, I cover a delimited amount of territory focusing on issues that I view as most pressing in this domain. Much more can and should be said, but I offer these as starting points for discussion.

GOTTFREDSON & HIRSCHI'S SELF-CONTROL THEORY

In their tour de force, Gottfredson & Hirschi (1990) challenged the field with a bold theory of criminal propensity rooted in classical theory assumptions of hedonistic rationality and universal (high) motivation to the immediate, simple pleasures received from crime. Although crime has a natural allure, G&H recognize that the benefits from crime are usually fleeting and minor and risk severe, albeit delayed, negative consequences. G&H thus theorize that after weighing costs and benefits, rational individuals should forgo crime. The question the theory addresses is why people offend given that “the balance of the total control structure favors conformity, even among offenders” (Gottfredson & Hirschi 1990, p. 86)? In other words, how can a rational, hedonistic actor choose an objectively more painful act?²

The answer, according to SCT, is found in differences in time perspectives in cost consideration at the point of decision-making. SCT is “a theory built on the idea that [the decision to commit] crime is governed by its short-term, immediate benefits, without consideration of long-term costs” (Gottfredson & Hirschi 1990, p. 33). In SCT, people with low self-control remain rational and hedonistic, but are myopic; their criminal and analogous actions reflect nothing more than a lack of foresight or consideration of delayed consequences (Felson & Osgood 2008). According to G&H, people with high self-control consider the full consequences of their acts, recognize that crime risks more pain than gain, and thus are deterred by the delayed formal and informal consequences of crime. Conversely, “people with low self-control [are] people inclined to follow momentary impulse without consideration of the long-term costs of such behavior” (Gottfredson & Hirschi 1990, pp. 190–91). Self-control is thus the key individual variable accounting for variation in crime and is defined as “the tendency of individuals to pursue short-term gratification without consideration of the long-term consequences of their acts” (Gottfredson & Hirschi 1990, p. 177), making low self-control tantamount to criminality and providing “a theory of the ‘motivated’ offender” (Nagin & Paternoster 1993, p. 470).

Although Gottfredson & Hirschi (1990) did not provide instructions for operationalizing their key concept (e.g., Akers 1991, Barlow 1991), a section in their book titled “The Elements of

²Hirschi & Gottfredson (1994, p. 4) raise this question explicitly: “The mystery is, rather, how some people can ignore or misapprehend the automatic consequences of their behavior, both positive and negative, and thus continue to act as though these consequences did not exist.”

Self-Control” has been used as a guide for self-control measures (i.e., Grasmick et al. 1993). These elements or characteristics describe what Gottfredson & Hirschi (1990) theorize people who commit crime (and have low self-control) are like.³ In general, G&H state, “people who lack self-control will tend to be impulsive, insensitive, physical (as opposed to mental), risk-taking, shortsighted, and nonverbal, and they will tend therefore to engage in criminal and analogous acts” (Gottfredson & Hirschi 1990, p. 90). Furthermore, G&H assert that “there is considerable tendency for these traits to come together in the same people, and since the traits tend to persist through life, it seems reasonable to consider them as comprising a stable construct useful in the explanation of crime” (Gottfredson & Hirschi 1990, pp. 90–91).

Turning to the source of variation in self-control, Gottfredson & Hirschi (1990) “adopted a ‘child-rearing model’ to account for the origins of (failure to learn) self-control” (Hirschi 2004, p. 541). Assuming that low self-control is the natural human condition (no special learning or motivation to crime needed), SCT proposes that effective parenting, which is driven by affection for the child and consists of monitoring, identification, and punishment of misbehavior, is sufficient to instill (high) self-control in children. Importantly, however, the critical period for the development of self-control is the first 8–10 years of life. After childhood, according to G&H, between-individual levels of self-control are fixed, and those who failed to develop self-control are doomed to “a life of misery for a moment’s pleasure” (Hirschi 2004, p. 540). For those individuals fortunate to be effectively parented and develop sufficient self-control, “socialization is a task that, once successfully accomplished, appears to be largely irreversible” (Gottfredson & Hirschi 1990, p. 107). Thus, against competing theoretical causes of crime, which posit that changes in parenting, peers, or life circumstances post-childhood can influence criminality (e.g., Sampson & Laub 1993, Simons & Burt 2011), SCT asserts that criminality is fixed at age 10 and that these putative social causes are in fact manifestations of self-control and thus events without causal significance (Gottfredson & Hirschi 1990, p. 119). In addition to stable criminality following childhood, SCT proposes versatility in crime and analogous acts, given that all crimes offer immediate pleasure at the expense of long-term costs.

RESEARCH ON SELF-CONTROL THEORY

Empirical assessments of SCT are plentiful, and at present, key theoretical postulates have all received sufficient empirical attention to assess their validity. Before discussing the key themes from this large body of research and their implications for the empirical validity of SCT, I should add a word about measurement.

From its inception, there has been a debate around the operationalization of self-control (e.g., Akers 1991, Barlow 1991, Piquero 2008). As mentioned above, most criminological tests of SCT utilize personality/attitudinal measures of self-control operationalized based on the elements of self-control, including the most widely used measure, the so-called Grasmick et al. scale, and measures created in its image. Despite its predominance, several scholars (including Hirschi) have argued that this measure does not accurately capture G&H’s conception of self-control—of

³These characteristics include a tendency to “respond to tangible stimuli in the immediate environment” (impulsivity) and have a “concrete ‘here and now’ orientation” (present orientation); prefer “easy or simple gratification of desires;” “lack diligence, tenacity, or persistence in a course of action (preference for simple tasks and lack of persistence);” be “adventuresome, active, and physical;” act “indifferent or insensitive to the suffering and needs of others” (insensitive, self-centered); and have “minimal tolerance for frustration and little ability to respond to conflict through verbal rather than physical means” (Gottfredson & Hirschi 1990, pp. 89–90).

variability in people's consideration of the long-term consequences of their acts (e.g., Burt 2012, Grasmick et al. 1993, Hirschi 2004, Marcus 2004).⁴ Given space constraints, the existence of several thorough discussions of the validity of common SCT measures, and, most importantly, the fact that I propose a shift away from SCT's model of self-control, I forbear any further discussion of the conceptual validity of these measures. (Interested readers should consult the above-cited pieces for more information.)

Self-Control as Criminality

Turning to the central premise of SCT, that self-control is a primary cause of individual differences in offending, empirical support is copious. In particular, a wealth of research shows that low self-control is strongly associated with delinquency and street crimes, measured cross-sectionally and longitudinally, using both self-reports and official criminal records and controlling for criminal opportunity (for reviews, see Burt 2015, Hay & Meldrum 2016, Tittle et al. 2003). Meta-analyses covering the first and second decades of research on SCT report effect sizes of $r > 0.20$, after controlling for competing theoretical and relevant demographic variables, qualifying self-control as "one of the strongest known correlates of crime" (Pratt & Cullen 2000, p. 952; Vazsonyi et al. 2017). Although surveys of youth engaged in relatively minor crimes predominate, self-control has been found to be significantly associated with crime among a variety of different populations (e.g., adult, adolescent, incarcerated, from various countries) with different outcomes (e.g., delinquency, crime, imprudent behavior, violent offending convictions) (see Tittle et al. 2003, Vazsonyi et al. 2017). In total, the evidence clearly suggests a strong negative relationship between higher self-control and delinquency, street crimes, substance use, and analogous shortsighted behaviors.

Like other microlevel criminology theories, research assessing SCT is dominated by attitudinal self-report surveys and reports of prior delinquency, much of it minor, inconsequential, and statistically normal. Furthermore, we have very limited knowledge of the theorized effects of self-control in situ as a decision-making factor. Thus, the putative causal role of self-control as consideration of delayed (negative) consequences at the point of criminal decision-making is, as yet, largely untested.⁵ In sum, scholarship evinces that self-control is associated with crime, but when, how, and why are not particularly clear despite ample research on the topic. As I discuss below, making headway on these issues—gaining a more complete and realistic picture of the role of self-control in crime—requires a more precise and multifaceted conception of self-control that recognizes both motivations and restraints.

Development of Self-Control

Focusing on self-control development and consistent with SCT, research suggests that caregivers have a particularly strong influence on children's self-control (e.g., Hope et al. 2003, Perrone et al. 2004). However, as Hay (2001) prominently noted, children's levels of self-control are shaped not only by caregiver demandingness (as effective parenting) but also caregiver responsiveness in terms

⁴Indeed, arguing against measures based on the elements section, Hirschi (2004, p. 542) acknowledged that they had erred in this discussion: "we can now see the errors introduced by our excursion into psychology and by the measures of self-control stemming from it."

⁵At least one assessment of this contention suggests that the effects of the Grasmick et al. measure of self-control on crime are not mediated by consideration of delayed sanctions (Tittle & Botchkovar 2005; see also Nagin & Paternoster 1993, Piquero & Tibbetts 1996). A few other studies that purport to test this key mechanism are limited in that SCT does not argue that people with low self-control cannot consider delayed consequences in cold situations or when asked to do so in response to hypothetical vignettes but rather that they do not do so in the moment when making choices (Piquero & Bouffard 2007).

of warmth, support, and positive reinforcement (Baumrind 1966, Jacobsen et al. 1997). Subsequent research has demonstrated that children whose parents are both disciplining and supportive [a style Baumrind (1966) labeled authoritative] have higher self-control, all else equal, than those whose parents are authoritarian (disciplining but not supportive), permissive (supportive but not disciplining), or neglectful (e.g., Burt et al. 2006, Vazsonyi & Belliston 2007, Vazsonyi & Huang 2010).

Importantly, caregiving practices are not the only influence on self-control development. Instead, research evinces that neighborhood, peers, teachers, schools, and even wider social contexts shape levels, between-individual differences, and changes in self-control among children and adolescents (e.g., Burt et al. 2006, Meldrum 2008, Pratt et al. 2004, Simons & Burt 2011, Teasdale & Silver 2009, Turner et al. 2005). In general, research suggests that traumatic, stressful life events, such as witnessing violence or experiencing criminal victimization, and adverse experiences, such as harsh or abusive parenting and racial discrimination, are associated with lower self-control (e.g., Agnew et al. 2011, Burt & Simons 2015, Burt et al. 2017, Monahan et al. 2015, Sharkey et al. 2012). Conversely, positive and supportive conditions, such as increased attachment to teachers and involvement with prosocial peers, are associated with higher self-control (e.g., Burt et al. 2006, Meldrum 2008). In sum, caregivers unequivocally have a—if not the—most significant influence on children’s self-control development during the formative years; however, other social–environmental cues and experiences that inculcate lessons about support, safety, and predictability as well as the wisdom of delaying gratification also shape self-control.

Stability of Self-Control

Turning to SCT’s stability postulate, scholarship reveals plainly that self-control is not stable after childhood (8–10 years old) but that within-individual levels and between-individual rankings of self-control continue to change through adolescence and into (at least early) adulthood (e.g., Hay & Forrest 2006, Na & Paternoster 2012, Ray et al. 2013, Winfree et al. 2006). For example, in their examination of self-control stability after SCT’s critical period of development, Burt et al. (2014) found that the proportion of reliable stability from wave 1 (10–12 years old) to wave 6 (23–25 years old) was a paltry 0.10. Studies using semiparametric group-based trajectory models (SPGMs) to estimate similar developmental pathways suggest much greater (approximate) between-individual stability for many (~40–60%); however, these generally stable trajectories exist alongside trajectories with significant fluctuations, including individual losses, gains, and oscillations in levels of self-control (e.g., Burt et al. 2014, Hay & Forrest 2006, Ray et al. 2013). Furthermore, SPGMs provide highly conservative estimates of between-individual stability, as they ignore (considerable) within-group fluctuations in rankings. Importantly, evidence suggests that observed self-control changes are not due to measurement error and are nontrivial in the sense that they are sizeable, consequential for crimes, and influenced by changes in the social factors just discussed (e.g., Burt et al. 2014, Hay et al. 2010, Na & Paternoster 2012). Thus, SCT’s stability proposition has been falsified, and self-control appears analogous to personality traits, which “are open systems that can be influenced by the environment at any age” (Roberts et al. 2008, p. 384).

To be sure, childhood appears to be an important or sensitive period for self-control development. Furthermore, longitudinal studies suggest that some individuals do appear to have relatively stable low or high self-control, with the latter group generally bigger than the former. However, it is not clear how much of this stability and/or predictive ability is due to persistent heterogeneity versus state dependence (Nagin & Paternoster 1991, 2000), including the cumulative or cascading effects of low or high self-control (e.g., early self-control deficits beget academic, peer, and institutional difficulties that knife off opportunities for improving circumstances; e.g., Nagin &

Paternoster 1994). There is no doubt that low self-control has numerous social consequences; however, these consequences are not events without causal significance.

Social Consequences of Self-Control

Several studies have addressed SCT's social consequences of self-control proposition, which postulates that events after age 10 are manifestations of self-control and only spuriously related to crime. To cut to the chase, the most accurate conclusion about self-control and social consequences is that the relationship is reciprocal (e.g., Evans et al. 1997, Thornberry et al. 1991, Wright et al. 1999). Through intertwined mechanisms of interactional and cumulative continuity, an individual's self-control (along with numerous other factors and chance) influences socialization factors such as caregiving (e.g., child effects on parenting) (Lytton 1990, Jang & Smith 1997, Scaramella et al. 2002) and selects or funnels individuals into different contexts and situations consistent with their preferences, which, in turn, sustains dispositions such as self-control (e.g., Evans et al. 1997, Simons et al. 2014, Wright et al. 1999). At the same time, self-control is but one of many factors that influences selection into social situations and various outcomes, and research shows that changes in social relationships, occupations, and other life alterations can effect change in self-control and crime across the life course (Burt et al. 2017, Sampson & Laub 1997).

For example, individuals with lower self-control tend to select into more dangerous situations (e.g., stumbling home drunk late at night alone) and are more often criminally victimized (e.g., Schreck et al. 2006; see Pratt et al. 2013 for a meta-analysis), and crime victimization is associated with decreases in self-control (e.g., Agnew et al. 2011, Monahan et al. 2015). Likewise, a copious and still growing body of research underscores the snowballing deleterious effects of justice system involvement on legitimate opportunity structures, especially educational and employment opportunities (e.g., Pager 2003, Sampson & Laub 1997), and relationships with family members (e.g., Stewart et al. 2002, Western 2018). Conversely, the successful exercise of self-control can result in positive reinforcements, including top marks as well as teacher and caregiver praise, and thereby provide a more supportive context for further enhancing self-control (Vohs & Ciarocco 2004). As with most things in human social life, early advantages tend to beget further advantages, and disadvantages accumulate and can entrench individuals in difficult situations, even as the possibility for change remains ever present. More research on the circumstances, timing, and effects of individual differences in susceptibility to social changes is needed to better understand conditions most conducive to self-control change (for better or worse) as well as the factors that underlie observed stability, which include social consequences of self-control.

Genetic Influences, Social Interventions, and Biological Maturation

Several scholars have challenged SCT's child-rearing model, arguing that self-control differences are largely a function of intergenerational transmission of genes rather than parenting practices (e.g., Beaver et al. 2007, Wright & Beaver 2005). Notably, Gottfredson & Hirschi (1990, p. 96) did not deny biological/genetic differences but rather argued that "[innate] individual differences may have an impact on the prospects for effective socialization (or adequate control). Effective socialization is, however, always possible whatever the configuration of individual traits." Thus, SCT maintains that early developing biological or genetic differences may make parenting more difficult, but socialization differences are ultimately the major cause of differences in self-control.

The accumulated evidence over the past few decades suggests that G&H's arguments about biological influences are oversimplified. Some children appear to suffer from neurobiological deficits in response to genetic variation and/or early-life environmental exposures (e.g., lead, nicotine),

which shape differences in executive functions, including working memory, attention shifting and concentration, episodic memory encoding, and learning contingencies that shape automaticity, among others (Ernst et al. 2001, Muller et al. 2018, Toro et al. 2008, Winter & Sampson 2017), and are linked to increased crime (Gibson et al. 2000, Stretesky & Lynch 2004). Furthermore, denying any genetic influences on the multitude of psychobiological factors that shape self-control processes, such as reward sensitivity and cognitive control (e.g., dopaminergic and serotonergic functioning) (Carver et al. 2009, Chambers et al. 2003, DeYoung 2013) and punishment- or threat-sensitivity (e.g., amygdala reactivity), is, at the present state of knowledge, indefensible (e.g., Forbes et al. 2009, Sapolsky 2017). That said, the evidence in support of the claim that parenting does not matter is flawed (e.g., Burt & Simons 2014), and the argument that “biogenic factors are largely responsible for the development of self-control” (Beaver et al. 2007, p. 1345) fails to acknowledge the “porousness of the biological to the social” (Meloni 2014, p. 6). In other words, counterposing a biological against a socialization model of self-control is misleading because life experiences affect development through biological mechanisms, including the wiring of our brain (e.g., Casey 2015). Thus, the idea that “low self-control is a brain-based disorder” (DeLisi 2015, p. 172), although implying (in this case, explicitly asserting) innateness and unchangeability, actually says nothing about cause or fixity. (And of course self-control processes are brain-based; where else would they be?)

Furthermore, strong evidence contradicting genetic-determinist explanations and in support of social influences can be observed in studies of self-control interventions. Numerous studies using randomized, controlled designs demonstrate positive changes in self-control in response to interventions in childhood, especially school-based programs designed to enhance educational achievement (see Ursache et al. 2012) and decrease conduct problems/delinquency (see Piquero et al. 2010, 2016). Although fewer in number, interventions to enhance parenting and/or self-control skills have also been found to effect significant and sustained change after age 10 (e.g., Brody et al. 2005).

Although, in my view, evidence convincingly debunks the claim that self-control differences are largely due to innate biological differences, this does not mean that biological factors are irrelevant. Not only do biological factors mediate the effects of social influences on enduring dispositions and behavioral outcomes, but also recent scholarship in developmental neuroscience suggests that normative age-graded changes in neural circuitry may shed light on one of the brute facts of criminology: the age-crime curve, which is characteristic (at least) of Western industrialized (individualistic) countries (Hirschi & Gottfredson 1993, Steffensmeier et al. 2017). However, incorporating these advances requires moving beyond SCT’s singular focus on consideration of consequences to recognize variation in impulse strength and control motivation, factors that are assumed to be invariant or largely irrelevant to crime in SCT. I now turn to a consideration of these assumptions.

BRIEF EVALUATION OF SELF-CONTROL THEORY’S ASSUMPTIONS AND MEASUREMENT

Unequal Motivation

SCT, like all theories, is grounded on assumptions, several of which have come under direct empirical scrutiny. Focusing first on motivation, the evidence is clear that SCT’s assumption of invariant motivation to (or temptation by pleasures from) crime is untenable (Tittle & Botchkovar 2005). Instead, individual differences in preferences (e.g., sensation seeking, tastes, desires), normative beliefs and personal standards, constraints and perceived costs, goals, opportunities, peer reinforcements, and other factors influence variation in the general motivation to commit crimes, the

perceived pleasures and gains from different types of crimes, and the situational incentives to crime (e.g., Burt & Simons 2013, Jacobs & Wright 1999, Nagin & Paternoster 1993, Tittle et al. 2004). We are not all equally tempted by opportunities to use LSD, shoplift, vandalize, or exact violent revenge on someone who harmed our reputation (Felson & Osgood 2008, Geis 2000). Motivation to crime is a variable: It varies across context and situations, between individuals, and for different types of crime, and it impacts offending in part by influencing the effects of self-control on offending (e.g., Burt & Simons 2013, Tittle & Botchkovar 2005).

Calculated Crime

Research also suggests that G&H's assumptions about the nature of crime—as unplanned, impulsive acts in the face of opportunity with little loss and less gain—do not accurately reflect the reality of crime as we know it. Certainly, many street crimes and perhaps most delinquency result from individuals' failing to recognize and weigh costly delayed consequences against meager immediate gains in criminal decision-making. However, as several scholars have articulated, some crimes, especially elite white-collar and corporate crimes, involve careful deliberation and a prioritization of long-term gains, which can be relatively substantial (Benson & Moore 1992, Geis 2000, Simpson 2013). Furthermore, research suggests that not just elite but also some forms of street crimes, such as drug dealing, involve at least a modicum of self-control and can be lucrative endeavors, especially when compared to the available alternatives (e.g., Fagan & Freeman 1999, McCarthy & Hagan 2001, Levitt & Venkatesh 2000). In the words of Bandura (1996, p. 20), "It takes proficient [self-control] to be a successful burglar, terrorist, unscrupulous businessperson, or corrupt politician."

Even seemingly nonutilitarian street violence can, in some circumstances, be motivated by long-term considerations. Although much street violence tends to erupt from ostensibly minor disputes, some of this seemingly impulsive, senseless violence in highly disadvantaged contexts is driven by a desire for respect, a currency that provides status and safety in the future (e.g., Anderson 1990, 1999).⁶ To be sure, the point of these examples is not to suggest that many crimes do not result from impulsive decision-making, but rather it is to show that the assumption that consideration of long-term costs leads inevitably to noncrime because crime invariably risks more pain than gain cannot be reconciled with the reality of crime. It is empirically invalid to assume that crimes result from failing to consider the long-term consequences or that crime cannot be utility maximizing in the streets or the suites. SCT's overriding assumptions that conformity maximizes utility and crime does not pay in the long-run reflect a middle-class bias that ignores the windfalls from elite crimes and the limited opportunity structures facing the truly disadvantaged.

Situational Variability, Domain Specificity, and Irrationality

SCT presumes a domain-general self-control ability (e.g., Muraven et al. 2006, Tittle et al. 2004). Although situations may vary in their opportunities for immediate gratification, SCT assumes a relatively constant temporal extension in the future in cost-benefit calculations shaping action choices that maximize utility. In this view, an individual with relatively high self-control who cognitively extends his consequence consideration beyond the immediate situation well into the future

⁶Thick descriptions of the lives and focal concerns of youths in dangerous, disadvantaged neighborhoods underscore the reality that for some the choice to carry a weapon or to respond to a challenge with physical force is made against the backdrop of a temporally extended view recognizing the long-term costs of loss of respect from backing down from an aggressive provocation or insult (e.g., Anderson 1990, 1999).

would carry this tendency with him to school, to work, out on the weekend, and when making decisions about dessert and when to go to bed; he makes rational choices based on the calculations from the relatively temporally extended consequences he considers.

Given the highly conditional nature of human behavior, along with the reality that different situational contingencies influence even such fundamental deliberative processes as how much time we have to consider consequences (e.g., deciding whether to run the light just turning red when running late to work versus considering for several days whether to report your extra income on your taxes), this casting of self-control as an unconditional general capacity, with situation-specific variance as merely noise or error, is oversimplified. Research suggests that in many choice situations relevant to crime, people are not acting with a situationally stable steady reservoir of (trait) self-control. Instead, situational precursors (e.g., prior exertions of self-control, general fatigue) and characteristics (e.g., emotional situations; alcohol involvement) nullify (or moderate) the influence of self-control capacity or ability, producing variation in state self-control (e.g., Muraven et al. 1998, 1999; Baumeister et al. 2018).

Future criminological research might beneficially focus on these situational departures from a person's general self-control capacity to better illuminate when self-control matters for crime and how situational variations in psychological processes underlie domain-specific outcomes in interaction with individual dispositions. One potentially fruitful approach involves identifying situation-behavior profiles in decision-making and impulsive action (e.g., Mischel et al. 2002, Tsukayama et al. 2013).⁷ Focusing on alcohol use, for example, most people are perhaps all too aware of the fact that inebriation influences normal decision-making processes, and we know that much crime, including serious violence, occurs under the influence of alcohol (e.g., Jacobs & Wright 1999, Pridemore 2004). Steele & Josephs' (1990) well-known and empirically supported alcohol myopia model explicates how the state of inebriation alters people's normal decision-making and self-control capacities. Specifically, this work shows that acute alcohol consumption narrows attention to salient situational cues, impairs cognitive processing and cost considerations, and therefore increases disinhibition and self-control failures (for an excellent review, see Giancola et al. 2010).

Another example of situation-behavior profiles (as patterned decrements in self-control) is found in research on emotional duress. Ample research suggests that people's self-control abilities deteriorate when under high-arousal emotional distress and in emotionally charged situations (e.g., Leith & Baumeister 1996, Tice et al. 2001).⁸ Emotionally charged situations seem to alter or hijack our normal (cool) reasoning capacities (e.g., Kahneman 2011, Mischel et al. 1973). Among other influences, emotional distress can decrease individuals' typical self-control by promoting a short-term prioritization of affect regulation over long-term goals (i.e., If you feel bad, do it!) (Tice et al. 2001).

Normal reasoning processes facilitating self-control are also altered in response to immediate threats. Specifically, cues of threat can bypass our normal deliberative [primarily prefrontal cortex (PFC)] neurocircuits to facilitate immediate, defensive reactions through a rapid-response pathway (Miller & Cohen 2001). Bypassing these deliberative circuits facilitates immediate, unthinking

⁷This is not to suggest that understanding general tendencies is not important or justified. It is. Rather it is to suggest that understanding domain- or situation-specific self-control processes and breakdowns is potentially important, even necessary, given their relevance to criminal behavior. After all, we have legal categories of crime with mitigated culpability due to departure from normal reasoning processes (e.g., voluntary manslaughter).

⁸In contrast, Clore et al. (1994; also Leith & Baumeister 1996) found that low-arousal forms of emotional duress produce more extensive processing of information, which also impaired self-control in some cases by promoting rumination rather than effective action (see also Agnew 2006).

survival responses. For example, when an out-of-control car is veering toward the sidewalk, one can push a child and dive out of the way before even cognizing the situation. However, this response speed comes at the expense of accuracy, producing circumstances where we may rapidly respond to a perceived threat (a gun) and respond defensively (shoot the person multiple times) before engaging our more accurate, deliberative neurocircuitry, which recognizes that the gun was actually a cell phone (Sapolsky 2017). In these situations, which fortunately appear to be rare for many of us, action as rapid response occurs without any rational cost–benefit calculations at all.

As these examples illustrate, when people drink heavily, are under extreme and chronic distress, and/or perceive a serious threat—all situations when irrational and/or shortsighted behaviors disproportionately occur—they are often operating without the full use of their self-control facilities. Compounding the problem, evidence suggests that repeating these situation–response patterns over time contributes to lower levels of self-control, perhaps especially in adolescence, as the underlying neurobiological pathways are potentiated (Casey 2015, Quinn et al. 2011). In sum, SCT’s assumption of a domain-general, situationally invariant level of self-control that influences cost–benefit calculations and rational choices as an unconditional generality does not capture the complex reality of human behavior in response to situational contingencies. Ample evidence that such departures from deliberative decision-making processes are involved in a nontrivial amount of criminal behavior behooves us to move away from the SCT model of domain generality to focus on understanding these situation–behavior profiles and connecting them to situational self-control processes.

The Elements Measures of Self-Control: Recasting as a Criminality Personality Typology

Amid the ongoing measurement debate, several studies have assessed the unidimensionality of the elements of self-control in the Grasmick et al. scale (and similar ones). Although not unequivocal, psychometric analyses suggest that the elements of self-control are multidimensional, such that they do not come together in the same people to compose a latent personality trait (e.g., Arnekleiv et al. 1993, Burt & Simons 2013, Longshore et al. 1996). Research has also shown that these various elements of self-control differentially predict crime and different types of crime (e.g., Arnekleiv et al. 1993, Greenberg et al. 2002, Pfefferbaum & Wood 1994).

These findings are consistent with scholarship in personality psychology showing that these elements are associated with different (and independent) facets of personality (e.g., Marcus 2004, Morizot & Le Blanc 2005, Romero et al. 2003). The unidimensionality of the elements of self-control is also contradicted by research in developmental psychology and neuroscience. For example, a growing body of scholarship suggests that impulsivity, as a tendency to act without thinking (Pickering & Gray 1999), is distinct from risk or sensation seeking, as a preference for intense or novel stimuli (Forbes & Dahl 2010, Zuckerman 1994), and these distinct personality traits have distinct neurobiological underpinnings and developmental timetables (Casey 2015, Ernst et al. 2006, Steinberg et al. 2008).

Thus, a wealth of evidence suggests that treating the elements of self-control as a unidimensional latent construct is unwise (Burt et al. 2014). To be sure, this constellation of elements is currently one of the strongest correlates of crime, and thus may be usefully considered a criminal personality typology, but one that is neither consistent with SCT assumptions nor reflective of G&H’s conceptual definition of self-control (Burt et al. 2014, Hirschi 2004, Marcus 2004). Moving forward, a recognition that this elemental self-control personality does not reflect self-control in general or as conceptualized in SCT is in order.

MOVING FORWARD: RECONCEPTUALIZING SELF-CONTROL QUA SELF-CONTROL

The concept of self-control has a long history, one that is generally overlooked in criminology. Dating back to Socrates, Plato, and Aristotle, and later Freud [1949 (1933)] and James [1950 (1890)], renowned scholars have been intrigued by humans' sophisticated abilities to delay gratification in the service of abstract long-term goals. Contemporary scholarship, especially in psychology, sparked by Mischel and colleagues' famous marshmallow experiments from the 1960s (e.g., Bandura & Mischel 1965, Mischel & Baker 1975, Mischel & Ebbesen 1970), has elucidated the different psychological processes underlying self-control (Baumeister et al. 1998, 2007; Carver & Scheier 1981; Kotabe & Hofmann 2015; Rachlin 2000). Until recently, this work focused largely on volitional control processes; however, more recent scholarship incorporates empirically evident variability in motivational processes, including individual variation in impulse strength (e.g., Duckworth & Steinberg 2015, Hofmann et al. 2009, Steinberg et al. 2008). Yet this large and growing collection of facts and insights from psychology, bolstered by mechanistic insights from neuroscience, has remained on the periphery of criminological work on self-control, which usually starts and stops with G&H's SCT.

As noted, the most significant challenge to integrating this scholarship into criminology is conceptual inconsistency. What G&H define as self-control is not consistent with its colloquial usage or common scientific definition (Duckworth et al. 2019, Rachlin 1974, Vohs & Baumeister 2004). With a few exceptions (Burt & Simons 2013, Wikström & Trieber 2007), criminologists have largely overlooked self-control's jingle-jangle problem,⁹ treating differences between self-control, impulsivity, ego control, self-regulation, delay discounting, willpower, risk seeking, executive functions, and reward seeking, among others, as largely superfluous (e.g., Hay & Meldrum 2016, Moffitt et al. 2011). The concept of self-control has actually been lost in the exuberance around SCT. Here, I build on recent scholarship decomposing self-control processes to clearly define self-control and differentiate between these concepts. I do so fully recognizing that residual differences in definitions remain, and yet a general consensus across a broad literature exists (e.g., Duckworth et al. 2019).

After covering definitional issues, I illustrate how these psychological processes shape differences in self-control and discuss their added value in understanding crime. In particular, this refined conceptualization allows for the consideration of the interplay between impulse strength and control efforts as dueling influences on criminal decision-making. This conceptualization also facilitates criminological recognition of several themes of recent researching, including that self-controlled behavior is distinct from the underlying psychological processes and that failure to consider competing psychological processes (dueling impulsogenic and control/volitional processes) can lead to faulty conclusions about the causes of self-control failures (e.g., Duckworth & Steinberg 2015, Kotabe & Hofmann 2015). Aptly describing these competing forces, Sir T.S. Clouston remarked, "The driver may be so weak that he cannot control well-broken horses, or the horses may be so hard-mouthed that no driver can pull them up" [cited by James 1950 (1890), p. 540]. Finally, I zoom out and discuss challenges and fruitful lines of research on self-control,

⁹Identified by Professor Aikens (credited in Block 1995) as an impediment to scientific progress, the so-called jingle problem refers to the use of the same conceptual label (self-control) to describe different processes. The jangle problem denotes the use of different conceptual labels (self-control, delay discounting, self-regulation) in different models or disciplines to describe the same concept (Kelley 1927). The consequence of the jingle-jangle problem is both the muddying of empirical findings and research inefficiency due to the operation of research on the same topic in parallel, impairing communication and the integration of state-of-the-science knowledge across disciplines into a coherent model.

emphasizing the fact that although understanding intrapsychic mechanisms is important, self-control does not operate in a social vacuum. Instead, social structural, contextual, interactional, and individual factors function as codeterminants of self-control outcomes (Bandura 1996, Mischel & Ayduk 2004, Simons & Burt 2011). I conclude by identifying several underexplored avenues for future research on self-control and crime.

Defining Self-Control

Self-control is variously considered an act, a capacity, and a depletable resource, but uniting these different usages is the key idea of resisting a desire or hedonic impulse, momentarily perceived as more gratifying, in the service of more valuable long-term goals and standards (Duckworth et al. 2019, Duckworth & Steinberg 2015, Kotabe & Hofmann 2015). Self-control—a subset of self-regulation—is the effortful inhibition of a prepotent, immediately rewarding response following a choice situation known as a self-control conflict. The conflict is the intrapsychic recognition of the incompatibility of a lower-order situational goal as a desire for immediate pleasure (a second piece of cake, going to a rave instead of studying for a test) and a more highly valued long-term goal (health/slimness, good grades/successful career/no criminal record). This presumes that higher-order goals, as relatively cool cognitive representations of desired end states, rewards, or achievements, are organized hierarchically (Kruglanski et al. 2002, Powers 1973).¹⁰

Despite goal hierarchies, intrapsychic conflict arises because of the temporal aspect, namely the universal tendency among humans (and other animals) to display steep temporal discounting of rewards and punishments (Ainslie 1975, Logue 1988, Rachlin 1974). Life is uncertain and unpredictable, and tomorrow is not assured, so to a degree that differs between individuals and across situations, we discount later rewards and punishments (Chisholm 1999, Mischel et al. 1989). Consequently, lower-order goals spike in relative value when they are in the immediate present as higher-order goals remain in the distant future (Ainslie 2001). Self-control conflict is thus this particular choice dilemma defined by a clash of situational impulses for smaller-sooner rewards against larger-later rewards or delayed punishments.¹¹ As Rachlin (1974, p. 94) averred, “Take the temporal issue away and the issue of self-control goes away as well.... If the unpleasantness and pleasantness are completely contemporaneous, self-control is not involved.” Psychologists studying self-control have long recognized that self-control is a now versus later issue (Ainslie 1975, Logue 1988, Rachlin 1974). Supporting this idea, recent research shows that trait self-control is associated with how well people deal with self-control conflicts but not with how they deal with other motivational conflicts, suggesting that self-control conflict is a unique temporal dilemma (Hofmann et al. 2014). This distinction between self-control and other conflicts is further supported by neuroimaging research (e.g., Casey et al. 2010, Somerville et al. 2010).

Thus, as an act, self-control (also called willpower, effortful inhibition, or ego control) is the behavioral forgoing of immediate gratification or the effortful restraining of oneself against immediate temptation in the service of more enduringly valued goals (Duckworth & Steinberg 2015,

¹⁰Higher-order goals are invariably associated with valued goals or personal standards as end states that motivate instrumental action (Moskowitz & Grant 2009). Higher-order goals, such as to be a good citizen and honest businessperson, can motivate action that either purely inhibits action (e.g., do not claim fake deductions) or motivates different action (do report all of your income to the IRS) (Kotabe & Hofmann 2015).

¹¹This model pitting immediate gratification against larger-later rewards also applies to punishment (smaller-sooner versus larger-later) and the response to negatively valenced impulse signals (unease, danger) that have to be overcome in the service of long-term goals, such as the urge to jump out of the dentist chair or to not get on a hot, cramped airplane to get to a conference (see Baumeister & Vohs 2004, Hofmann et al. 2009, Trope & Fishbach 2000).

Kotabe & Hofmann 2015). Self-control failures are unsuccessful efforts to forgo temptation. As a general capacity, self-control is an individual's overall ability or tendency to resist immediate temptations for long-term goals, all else equal, analogous to the weight and reps a person can usually bench press.¹² Finally, as a depletable resource, as conceptualized in the strength model that highlights situational variability, self-control is conceived as a limited-capacity resource, akin to a muscle, that is depleted/fatigued and can experience failure with repeated short-term exertions but can be strengthened over time with moderate practice and sufficient recovery (e.g., Baumeister et al. 1998, Muraven et al. 2006).

Quite obviously, SCT's conceptualization of self-control as consideration of future consequences is not tantamount to this widely shared conception of self-control (Burt & Simons 2013, Wikström & Treiber 2007), and these differences are not superfluous.¹³ Self-control may be exerted in response to recognizing more highly valued goals or long-term costs, but recognizing costs is a necessary but insufficient step in the process leading to successful self-control. Acting on impulse without consideration or deliberation (i.e., impulsive behavior) can lead to unwanted behaviors or violations of self-standards resulting from a failure to recognize a self-control conflict, but the act may not be problematic, (i.e., if the act does not violate the individual's standards or conflict with long-term goals). If there is no impulse-goal conflict, then self-control is not involved. Gottfredson & Hirschi's theorized concept of low self-control captures lack of foresight leading to impulsivity rather than self-control failure because temporal conflict is never identified.

In addition, self-control failure cannot be inferred from criminal or otherwise risky or unhealthy behavior. If Harvey believes that as a star maker he deserves sexual access to his actress employees, such that his frequent sexual coercion involves no goal conflict (or concern that he will get caught), his criminal behavior does not involve a self-control failure. Assuming self-control failure from behavior, as SCT does, is misguided. Furthermore, incompatibility of immediate desires and long-term costs triggers a self-control conflict but does not, unfortunately, inevitably lead to success. For illustration, Donald, who, having almost been caught a few weeks ago, swore off shoplifting, visits Target and immediately experiences the urge to steal something after entering the store. After wandering the store for 20 minutes deliberating—considering consequences and reminding himself of his promise to not steal anymore—he then steals the item anyway. Is this a self-control failure? Yes.¹⁴ SCT cannot explain these failures as it assumes that recognition of long-term costs inevitably leads to success; yet, like Donald, all of us sometimes fail to resist our temptations.

¹²The concept of self-control as a capacity—or a relatively situation-independent stable trait—is less meaningful when broken down into the various components and recognizing situational variability and context dependence. Much of the debate around the construct of self-control is rooted in the problem of eliding the distinction between behavior, which is shaped by numerous contextual contingencies, and stable(ish) (within-person) individual-difference traits.

¹³Gottfredson & Hirschi (1990) make a brief note of the fact that their concept is not exactly self-control, remarking that they considered other labels such as conscience before settling on self-control. Even so, the term self-control was widely used outside of criminology prior to the advent of SCT, and numerous scholarly works on self-control processes, including Mischel and colleagues' celebrated marshmallow studies, predate SCT (e.g., Ainslie 1975, Ainslie & Herrnstein 1981, Carver & Scheier 1981, Mazur & Logue 1978, Rachlin 1974). Surprisingly, none of these salient works were referenced in Gottfredson & Hirschi's (1990) book. Thus, from the start, SCT existed largely in isolation from the broader literature on self-control. It is past time to rectify this situation.

¹⁴Ainslie (2001) refers to this as choice instability. Donald's theft—as a self-control failure—is characterized by choice instability, in that he made a different decision (not to steal) prospectively, before actually being in the store and experiencing the in-the-moment spike in desire.

Thus, the construct G&H label high self-control is better labeled consideration of future consequences and their conception of low self-control better conceptualized¹⁵ as impulsivity (acting without thinking in response to situational stimuli).¹⁶ As a necessary step to align criminological scholarship with scientific advances on the multifaceted psychological processes underlying self-control, I propose relabeling SCT's low self-control as impulsivity (or perhaps more narrowly as present orientation or shortsightedness). From this point forward, my use of self-control refers to the standard definition of self-control, as the effortful control of the self against temptation in the service of enduring goals, not G&H's self-control.

Control Motivation, Control Capacity, and Dual-Influence Models

The experience of temptation in self-control conflicts can be described as an intrapsychic tug-of-war between impulses and control motivations. Self-control outcomes thus result from the interplay of these processes, and joint consideration of these impelling and restraining forces will enhance models of self-control (Hofmann et al. 2009, Strack & Deutsch 2004). Consistent with recent dual-influence models (e.g., Hofmann et al. 2009, 2012; Steinberg et al. 2008), I define an impulse as a psychological urge or prepotent response tendency that arises when global motivations, rooted in innate or learned associations and reinforcements (e.g., food, safety, status, rest, alcohol/drugs, sex), meet specific activating stimuli in the environment (Hofmann et al. 2009). Although varying in strength, impulses generally possess strong incentive value, which motivates approach to immediately rewarding stimuli and away from threat (Lowenstein 1996, Metcalfe & Mischel 1999). Impulses are immediate in both a temporal and a spatial sense, and people can experience impulses without consciously knowing why (Ainslie 1975, Hofmann et al. 2009). Impulses emerge in a relatively automatic manner as subcortical reward processing centers (e.g., nucleus accumbens) respond to situational stimuli and appraisals against the backdrop of internal need states and learning history (Hofmann & Kotabe 2012, Hofmann & Van Dillen 2012). As Hofmann et al. (2009, p. 163) noted, "Following our impulses would be biologically adaptive if we're designed to live only for today and without concern for other people's well-being." However, surviving invariably requires social cooperation, and development and reproduction take more than a day even as adaptive individual timelines vary based on circumstances (e.g., Chisholm 1999). Importantly, just as people differ in their control capacities, they also differ in their reactions to various stimuli. These differences are likely due to a combination of current need states, biological endowment, and differences in learning history (e.g., Hofmann et al. 2009, Strack & Deutsch 2004).

In contrast to impulses, higher-order goals are usually more abstract (imagined futures) and more strongly associated with one's values and virtues (e.g., I am not going to use drugs because they are unhealthy and illegal) (Fujita 2011, Kotabe & Hofmann 2015). Like impulses, higher-order goals vary in strength. At a cognitive level, higher-order goal strength may correspond with the accessibility of the associated target end state and supporting mental representations (Fishbach & Ferguson 2007). In general, goal strength is determined by at least three (invariably correlated) factors: importance (the degree to which a goal represents a high-priority objective) (Fishbach et al. 2003), commitment (one's determination to achieve the goal) (Hirschi 1969, Klein et al.

¹⁵By "better characterized," I mean more usefully, with the aim of facilitating conceptual coherence and consistency.

¹⁶I should perhaps note that G&H's self-control incorporates two distinct cognitive processes: deliberation (i.e., time taken to consider consequences) and cognitive extension into the future or transcendence, defined as "the capacity to perceive the immediate stimulus environment in relation to long-range or abstract concerns" (Baumeister 1995, p. 122). Given that self-control situations are defined by the clash of situational impulses for immediate gratification against long-term goals, this distinction in self-control conflicts can be ignored.

1999), and self-efficacy and perceived control (one's perceived ability to successfully achieve the act and avoid obstacles) (Bandura 1977, Mischel & Ayduk 2004). Higher-order goal strength, in concert with situational factors, shapes control motivation,¹⁷ which is defined as the aspiration to control temptation (see Carver & Scheier 1981, Kotabe & Hofmann 2015, Kruglanski et al. 2002).

Recent models of self-control have recognized the importance of monitoring and detection of response conflicts as key processes in the activation of effortful self-control, which vary between individuals and across situations, contingent on goal and impulse strengths (e.g., Inzlicht & Legault 2014, Kotabe & Hofmann 2015, Milkman et al. 2008). Conflict-monitoring theory, supported by several experiments and simulations, proposes that the anterior cingulate cortex activates in response to the detection of conflict, functioning as an internal alarm that triggers self-control processes (Botvinick et al. 2001, Yeung et al. 2004). When self-control processes are activated by impulse–goal conflict, the impulse becomes a temptation and the higher-order goal becomes a self-control goal (Kotabe & Hofmann 2015). Whether self-control is successful depends on whether the control effort expended is sufficient to overcome the temptation, with control effort defined as the actual amount of mental energy a person invests to overcome inhibition and work toward higher-order goals (Kotabe & Hofmann 2015, Muraven et al. 2006). Individuals do not usually expend maximum self-control effort in response to every self-control conflict due to competing demands, the principle of energy conservation, and barriers (such as fatigue) (e.g., Baumeister et al. 2018, Kotabe & Hofmann 2015). Thus, advancing knowledge of the factors shaping motivation, effort, impulse strength, and various factors that moderate control efforts (e.g., responding to repeated peer pressure to violate the law or inhibiting aggressive responding to frequent bullying) is crucial to understanding self-control outcomes because one's maximum self-control capacity is not sufficient to explain variation in behavior, even if all else is equal (which it never is).

Longstanding but recently elaborated dual-influence models organize these oppositional forces into dueling impulsigenic (shaping impulse/temptation strength) and volitional control processes (particularly executive functions)¹⁸ (Hofmann et al. 2009, Metcalfe & Mischel 1999, Steinberg et al. 2008). These models highlight variation in both impulsigenic (e.g., sensation seeking, reward sensitivity, cravings) and control efforts across time, individuals, and situations, and recognize that both forces need to be taken into account. In these models, impulse strength is pitted against control effort, which is jointly determined by control motivation and control capacity. Although some elaborations of dual-influence models are understood to imply discrete control versus impulse brain substrates, this framework is functional, not neuroanatomical (Duckworth & Steinberg 2015). Instead of discrete dual systems, more recent work, informed by advances in neuroscience, adopts circuit-based rather than region-based explanations. Circuit-based accounts highlight differences between individuals and changes across time in the wiring and fine-tuning of connections within and between complex subcortical and cortical prefrontal and limbic circuitries, which shape variation in impulse strength and cognitive control (for an excellent review, see Casey 2015).

Psychological and developmental neuroscientific advances have greatly enhanced our understanding of multifaceted factors involved in self-control. Criminologists have the distinct

¹⁷What Tittle et al. (2004) called self-control desire is tantamount to control motivation. I adopt the term control motivation given the use of desire in this literature as an impulsigenic factor that “directs a person toward immediate reward related stimuli” (Kotabe & Hofmann 2015, p. 619).

¹⁸Executive functions include working memory, task switching, and response inhibition, which are supported by prefrontal regions and collectively facilitate control by allowing individuals to focus attention, keep abstract higher-order goals as active mental representations, and suppress undesired thoughts (Diamond 2013, Duckworth & Steinberg 2015).

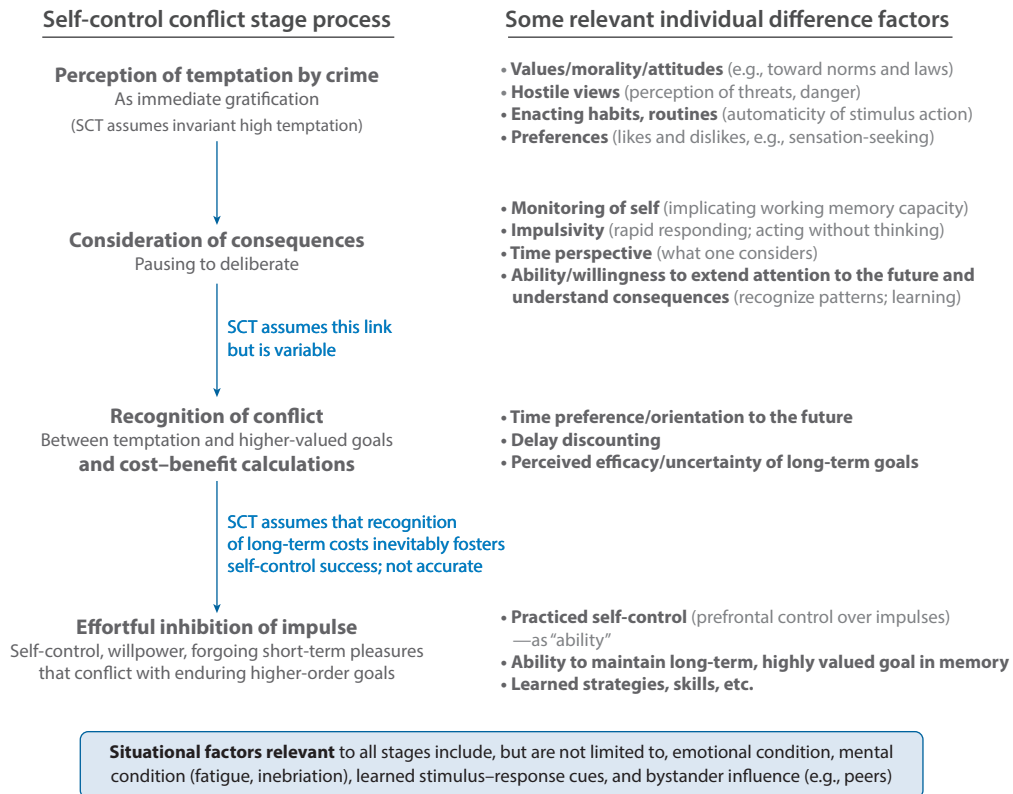


Figure 1

Self-control: heuristic overview of the process of self-control and individual differences relevant to crime. In the face of criminal opportunity, individuals may be tempted or not. If they are tempted, they act impulsively or pause to deliberate before acting, and, if so, consider the costs and benefits. If they recognize a conflict between temptation for crime and higher-order goals (self-control conflict), they may then exert self-control to promote goal pursuit. Whether self-control efforts are successful depends on motivation, effort, and the efficacy of strategies employed. Abbreviation: SCT, self-control theory.

challenge of considering how these factors shape criminal behavior. In the next section, I sketch a heuristic model that incorporates these various individual differences and situational processes.

The Complex Self-Control Process: A Heuristic Overview

Figure 1 displays a simplified overview of a self-control conflict relevant to crime. Here I incorporate insights from several different models of self-control to highlight individual differences and complex multistage variation, which SCT ignores (Duckworth et al. 2019, Kotabe & Hofmann 2015, Tittle et al. 2003, Vohs & Baumeister 2004). Notably, the process depicted in this figure is not intended as a theory of self-control, as it contains no predictions, but is merely a heuristic model of self-control processes, oversimplified but useful for illustrating several key points about self-control, including the different etiologies of indulgence beyond present orientation. For clarity, these stages are presented sequentially, but in reality, they can overlap in a dynamic, reciprocal process. Although I spotlight sources of within- and between-individual variation in self-control processes in **Figure 1**, it should be remembered that these individual differences always operate interactionally in concert with ongoing cultural and situational influences.

As discussed and displayed in **Figure 1**, self-control consists of several intersecting social cognitive (qua perceptual), motivational, and affective processes shaped by past experiences, sociocultural context, precursors, and situational elements (Kotabe & Hofmann 2015).¹⁹ To any given situation, people bring a unique set of social schemas, memories, beliefs, and interests, which shape, *inter alia*, perceptions and definitions of the situation, perceptions of opportunities, and cost–benefit appraisals. These individual differences explain variable responses to what appears to be, to the outside observer, the same objective situation (e.g., Duckworth et al. 2019, Simons & Burt 2011, van Gelder & de Vries 2013). These percepts and appraisals influence the interpretation of and reaction to stimuli (e.g., shaping desire and strength of impulse) and representations of costs and rewards; examples include hostile views of relationships and internal standards, beliefs, or morality. For example, Wikström’s (2006) situational action theory emphasizes the importance of morality or personal standards in shaping perceptions of opportunities for crime (see also Wikström & Treiber 2007). Wikström and colleagues theorized that many people in most situations never even perceive or cognitively encode opportunities for crime; thus, crime never becomes a temptation that they have to resist. Similarly, Simons & Burt (2011) highlighted the importance of social schemas in shaping situational definitions relevant to temptations and action alternatives, theorizing that patterned variation in social experiences profoundly shaped by social position influences how people perceive the world and their action alternatives, including the possibility of and/or justification for crime. Motivational aspects involved in self-control situational definitions include goals, desires, preferences (likes and dislikes), reward sensitivity, pain/loss/risk aversion, interests, values, and commitments, among others that are also clearly shaped by social position, past experiences, and affective factors (Fishbach & Shah 2006, Nurmi 1991). These affective aspects include more stable characteristics such as optimism versus pessimism, hope versus despair, and more transient or situational emotions such as anger, fear, sadness, joy, and biological (hunger, pain) states. These various individual difference factors are all intertwined in an unfolding self-control situation with numerous contingencies.

As the foregoing suggests and this review has discussed, SCT greatly oversimplifies a more complicated, multifaceted process. The most important takeaway from **Figure 1** is the range of salient individual differences that shape impulses or temptations and control motivations and that are wrongly assumed to be constant or unimportant in SCT (Burt & Simons 2013, Tittle et al. 2004). What G&H astutely note about the complexities of childrearing is also true about self-control processes: “what may at first glance appear to be unproblematic turns out problematic indeed. Many things can go wrong” (Gottfredson & Hirschi 1990, p. 98). First, as noted, SCT’s theorized causal variable of consideration of consequences captures but one source of variation at one stage in this process (**Figure 1**). Variation at this stage is also influenced by situational factors as well as individual factors such as self-monitoring, time orientation, and the ability to recall the lessons from past experiences and apply that information moving forward (e.g., Paternoster & Pogarsky 2009).

SCT also overlooks important variation in preceding factors (see Perception of Temptation by Crime in **Figure 1**), many of which are the focus of competing theories (e.g., Akers 1973, Sutherland 1947, Wikström & Trieber 2007). Ample research inside and outside of criminology underscores the importance of individual differences in shaping perception of and temptation by opportunities for crime. For example, individual differences shaping variation in these temptation processes (variation in the perception of opportunities for immediate gratification and the degree

¹⁹The distinction between cognitive, motivational, and affective dimensions is somewhat artificial, as motivations and emotions are, of course, cognitive, and affect shapes motivation and vice versa. However, it is useful to demarcate different facets of this intrapsychic process.

to which one is tempted by these opportunities) include social schemas that shape situational definitions (i.e., hostile views): personal standards, values, morality, preferences, and habits, to name a few. As Wikström & Treiber (2007) noted, many of us never perceive opportunities for crimes that exist all around us; we are never tempted, and we do not experience a self-control conflict and thus do not need to expend self-control. Similarly, what is perceived as a serious threat or affront in one person's interpretation is an accident or a mistake by another, and these definitions shape what might follow from an action (violent retaliation, apology, tolerance) (Simons & Burt 2011), producing behavioral differences relevant to crime potentially having nothing to do with self-control. Again, if there is no higher-order goal or standard that conflicts with an impulse, there is no impulse–goal conflict, and self-control is irrelevant to the action.

Briefly discussed above, a growing body of research emphasizes the importance of desire or temptation strength (see Hofmann et al. 2009, Rawn & Vohs 2011), and the degree to which such temptations are domain specific and affected by personal standards (e.g., Tsukayama et al. 2012, 2013; Wikström & Treiber 2007). Although we are all tempted by something, we are not all equally tempted by crimes, and our preferences—shaped by past experiences, social position, culture, context, sex/gender, and biological factors—all influence the nature and strength of our temptations. Research on domain specificity in impulses and in exposure to everyday temptations highlights the effects of individual personality differences, such as sensation seeking, on the nature, strength, and experience of temptations as well as the interaction between desire strength and resistance in determining behavioral enactment (e.g., Hofmann et al. 2012, Imhoff et al. 2013, Tsukayama et al. 2013). Interestingly, recent scholarship also reveals that, in general, people who experience fewer self-control failures do so not because their self-control efforts are more successful, but rather because they experience fewer temptations. That is, in their everyday lives these people are less reliant on in-the-moment cognitive control of impulses as effortful exertion of self-control; instead, their lives are more characterized by beneficial habits (Galla & Duckworth 2015). When people act out of habit, they respond automatically to contextual cues or stimuli and thus do not consider action alternatives, engage in cost considerations, or expend effort inhibiting unwanted responses (Galla & Duckworth 2015, Ouellette & Wood 1998, Wikström 2006).

Figure 1 depicts several paths that SCT assumes are invariant but that research has shown to be variable. As noted, the consideration of consequences does not inevitably lead to a recognition of conflict with long-term goals. Thinking about the future and recognizing that one's contemplated act in the present threatens this distant future (recognizing impulse–goal conflict) are two different things, and various emotional and need states, including joy, anger, and despair, influence the connections we make in our cognitions and calculations, which is how the same person in the same situation can forgo the offer of cocaine one night and use it the next. Similarly, recognizing that an act is not utility maximizing (and deciding that one should forgo the act and exert self-control) does not automatically lead to successful self-control.

Unfortunately, we all fail at self-control sometimes, whether it is our commitment to get up early to exercise, to have only one drink, to report all our income to the IRS, to drive the speed limit, etc. Whether a response to peer pressure, fatigue, lack of success, frustration, or changing affect, or—as was often the case in Mischel's marshmallow experiments—the desire or temptation for the object of immediate gratification is just too much to resist, we fail despite our initial decisions to exert self-control. In short, although consideration of consequences is a prerequisite for self-control, it is, unfortunately for us, not sufficient to ensure success.

FUTURE RESEARCH: ORDERING THE COMPLEXITY

SCT is gloriously parsimonious but empirically invalid. The solution, however, does not require a drastic shift into a theoretical trap of overwhelming complexity, as the above discussion might

suggest. Instead, in my view, a pressing agenda for research on self-control and crime is identifying for whom, when, and how self-control failures produce crime, along with a concerted effort to understand the root causes of individual differences in underlying cognitive control and motivational processes. Given evidence of malleability to social influences into emerging adulthood, this work should focus on identifying social influences that are amenable to change through social policies and interventions. Below, I identify two lines of self-control research in criminology that may be fruitful.

Adolescent Vulnerability and Opportunity

Over the past decade, a new perspective on adolescent risk-taking and decision-making, informed by advances in developmental neuroscience, has emerged (e.g., Casey et al. 2008, Dahl 2004, Steinberg et al. 2008). These adolescent maturational imbalance models depart from the assumption that impulses remain constant over development and that what changes with maturation is cognitive-control abilities (Duckworth & Steinberg 2015, Ernst et al. 2006, Steinberg et al. 2008). These adolescent imbalance models have proven particularly useful in illuminating changes in risk-taking in adolescence, providing new insights into the age-crime curve (e.g., Steinberg et al. 2008). If self-control were merely dependent on volitional control capacities, then it would be difficult to explain the observed increase in real-world and laboratory-based risky behaviors from childhood to adolescence, especially given evidence of gradually maturing cognitive-control abilities into the mid-twenties (Giedd 2008, Paus 2005, Steinberg et al. 2008). On the basis of findings from developmental human imaging and nonhuman animal studies, these imbalance models theorize adolescent heightened mesolimbic responsiveness, which increases impulses to immediate rewards, against insufficiently matured cognitive-control circuitry (Casey 2015). In this view, the peak in adolescent risk-taking is a function of increases in reward sensitivity, which precede the structural maturation of more robust cognitive-control circuitry (Steinberg et al. 2008). Indeed, some scholars have likened this period of heightened susceptibility to temptations to one of “all gasoline, no brakes, and no steering wheel” (Bell & McBride 2010, p. 565).

Although catchy, this “all gas, no brakes” metaphor for adolescence is oversimplified (Casey 2015). Instead of a general mesolimbic sensitivity to rewards, adolescents display an increase in sensitivity to certain incentives, particularly status-related rewards (money, peer acceptance) and novelty seeking (Galvan et al. 2006, Steinberg et al. 2008). For example, Chein et al.’s (2011) driving simulations showed that when operating solo in the service of time-related rewards, adolescents are no more likely than adults to run a red light (in the experimental computer task). However, in the presence of peers, adolescents become significantly more likely to run the red light, whereas adults’ decisions are unchanged (also Gardner & Steinberg 2005). Notably, this different pattern of risk-taking by peer context was associated with differential anticipatory activation of reward circuits in adolescents.²⁰ These lab-based driving simulation results are consonant with real-life behavior; adolescents, unlike adults, are more likely to get in car accidents in the presence of peers (Chen et al. 2000). In short, a growing number of studies suggest that adolescence is a time of heightened sensitivity to certain incentives (e.g., money, peer acceptance) and in some contexts (e.g., in the presence of peers), and this heightened sensitivity appears to be undergirded by changes in dopamine-rich regions of the brain (i.e., the ventral striatum) that are important for learning and predicting action outcomes (e.g., Jones et al. 2011, Lin et al. 2012, Meshi et al. 2013, Rademacher et al. 2010).

²⁰Specifically, fMRI results showed that, relative to adults, adolescents had significantly greater activation of the ventral striatum and orbitofrontal cortex as they made decisions about risk but only when their friends were watching them (Chein et al. 2011).

Interestingly, not only do adolescents show increased responsivity to particular positive reward cues that may tax their control capacities, but adolescents, especially males, also display heightened amygdala reactivity (relative to adults or children) to cues of potential threat and increased impulsive responding (Dreyfuss et al. 2014, Hare et al. 2008). Thus, adolescents' heightened reactivity to both positive and negative socioenvironmental cues, relative to children and adults, along with limited relative control capacity to regulate these responses, makes adolescence a window of vulnerability to social rewards and threats (Casey 2015). Future criminological research would benefit from drawing on dual-influence adolescence imbalance models to enhance knowledge of the role of adolescent heightened reward responsivity, especially in social contexts, on criminal behavior in concert with the many social challenges during this period as well as its interplay with culture and individual differences (e.g., Burt et al. 2014, Steffensmeier et al. 2017).

Importantly, this evidence that adolescence is a period of sensitivity to social influences and cognitive-control immaturity is not all bad. As Steinberg et al. (2008) and others have noted, adolescence is a period of rapid growth and neurobiological development, which makes it one of great potential for change, in general, and opportunity for positive change in self-control capacities, in particular (Dahl 2004). The extensive remodeling of control and reward neurocircuitry—ranging from neurogenesis to programmed cell death, synaptic pruning, and myelination (e.g., Casey 2015, Steinberg et al. 2008)—opens the adolescent brain to social–environmental influences, creating a sensitive period for learning and developmental change (Anderson 2003, Blakemore & Mills 2014, Ellis et al. 2012). This period of heightened plasticity provides an opportunity for adaptive change in response to environmental, especially social, cues about not only danger, support, and resource availability but also individuals' social status, attractiveness, and ability to amass resources (Jackson & Ellis 2009).

Evidence that adolescence and young adulthood are crucial periods for personality change underscores the importance of investigating the causal mechanisms responsible for personality change over these periods in the life course. Because adolescence is characterized by significant biological and social changes, it will be challenging but important that future research disentangles the effects of social changes from neurobiological maturation while attending to their interactions. There is also a compelling need to enhance knowledge of sex/gender differences. At present, there is a dearth of knowledge of how gender dynamics, as main effects or in interaction with biological ones (such as hormones), influence the development of these self-control processes (Burt et al. 2014). Furthermore, given well-known sex/gender differences in impulsivity, risk-taking, and crime (e.g., Cross et al. 2011, Simons & Burt 2011), more concerted efforts to understand how such biological factors act in concert with social influences to shape differences in various distinct self-control processes between males and females are needed.

Self-Control in Context: Hope, Self-Efficacy, and Control Motivation

In this review, I have proffered a view of self-control as an emergent interactional process shaped by much more than consideration of consequences. A move away from SCT's singular focus on stable, domain-general individual control will allow us to better understand patterned variation in self-control processes and criminal outcomes across context, social position, and development as well as their influences on impulse strength, control motivation, and control effort. Moving forward, increased attention to the influence of social factors and their effects on and interplay with individual differences in shaping self-control processes related to crime could be especially valuable.

For example, investigations of the cumulative and interactional effects of social disadvantages on self-control processes might profitably build on recent scholarship in developmental

evolutionary psychology as well as criminological work revealing the profound lack of hope and despair among many youths in highly disadvantaged positions (e.g., Anderson 1999, Brezina et al. 2009). The detrimental effects of poverty, rampant crime, and racism, in part through their effects on soft skills (including self-control skills), on educational performance and risky behaviors are well-documented (e.g., Burt et al. 2017, Heckman 2008, Vohs 2013). Research on highly disadvantaged youths suggests that in the face of such difficulties, many focus on the here-and-now because tomorrow is not guaranteed and their long-term prospects for achieving conventional success goals are, to put it plainly, not good, and they know it (e.g., Anderson 1999, Brezina et al. 2009, Pepper & Nettle 2017). As Baumeister et al. (1994) noted, a necessary trigger for self-control is having long-term goals and a commitment to those goals (Kotabe & Hofmann 2015). Without a strong goal commitment, the motivation for self-control is lacking. If one concludes that they will not succeed in reaching long-term goals whether by lack of skill or unfair allocations of rewards, what is the point of forgoing immediate gratification (Burt et al. 2012, Ellis et al. 2012)? Facing the choice of reward now or never, the rational choice is now. Thus, for many, the problem may not be a lack of control capacity but rather a lack of hope and control motivation. Policies and programs that seek to foster opportunities and hope for long-term success goals may provide crucial control motivation for disadvantaged youths.

However, fostering unrealistic success goals is not the answer. As discussed above, low self-control tends to beget lower self-control in part through the unsuccessful goal striving that it tends to foster (via negative teacher evaluations, individual frustrations), whereas those students who have higher self-control tend to receive the more proximal reinforcements that sustain long-term goal pursuit (Duckworth et al. 2019). Having strongly held goals and self-efficacy and perceived control over the ability to reach one's goals is the sine qua non of self-control [Bandura 1977, Piaget 1968 (1964), Shapiro et al. 1996]. Deprivation without purpose is both irrational and nonadaptive.

But, of course, having realistic goals is not enough. One must be able to keep them in mind and prioritize them against competing impulses; this requires practice, working memory, effort, and time and safety (e.g., Duckworth et al. 2019, Mann et al. 2013). Deliberation and PFC processing are luxuries reserved for those people who are not cognitively overloaded with, for example, survival efforts, threats, or emotional duress. In concert with efforts to promote realistic hope and security, ongoing efforts to inculcate and strengthen volitional control skills to help people successfully inhibit impulses in the service of long-term goals along with efforts to foster proactive strategies that avoid temptations in the first place should be beneficial. If we can help people develop a future to work toward and beneficial habits that facilitate goal-striving, criminal temptations, and thus crime, may be reduced.

CONCLUSION

In their stimulating tome, Gottfredson & Hirschi (1990) are bold, dismissive, and challenging, characteristics which no doubt contributed to the considerable scholarly attention the theory has commanded. SCT changed the course of criminological research, directing attention to the relevance of internal controls in crime causation, emphasizing the important role of caregivers in influencing levels of self-control, and highlighting the fact that some people suffer the numerous negative consequences of short-sightedness throughout the life course. However, SCT's popularity has also facilitated the accumulation of negative evidence for the theory. The very features that most distinguish SCT from other theories of crime and from other models of self-control—its theoretical emphases on parenting being the exclusive cause of individual differences in criminality qua self-control, a critical period of self-control development in childhood, equal high motivation to the immediate benefits of crime, variable recognition of long-term consequences including the

recognition that crime invariably decreases subjective utility (provides more pain than pleasure)—are not empirically supported. Thus, in my view, a level-headed assessment based on our current model of science advancement through theory falsification suggests the need to move beyond SCT.²¹ No doubt, SCT contains several valuable insights, and tests of the theory have significantly advanced criminological knowledge; yet, the theoretical assumptions are untenable, and the propositions oversimplify and distort a more complicated reality. This combined with the fact that SCT advances a unique conception of self-control, which impairs the integration of several decades of knowledge advances from alternative models, makes the need to move beyond SCT more urgent. In fact, I argue that based on our current stock of knowledge, failing to move beyond SCT would be anchoring, if not regressive, for criminology.

Although it may be tempting to stick with the SCT model that has dominated research, this temptation should be resisted. Moving beyond SCT not only promotes conceptual clarity and integration of empirical findings but also directs attention to crime-relevant individual and situational factors beyond consideration of consequences. Underexamined issues from differential motivation to situational variability and domain specificity cannot be explored within the theoretical framework of SCT, and research advances suggest that these differences exist and are consequential for crime. Researching these variable processes should put us in a better position to understand how and when self-control failures lead to crime and how we can best intervene to prevent crime and promote well-being.

DISCLOSURE STATEMENT

The author is not aware of any affiliations, memberships, funding, or financial holdings that might be perceived as affecting the objectivity of this review.

ACKNOWLEDGMENTS

Preparation of this review was supported by a grant from the Eunice Kennedy Shriver National Institute of Child Health and Human Development (1K01HD093825-01). I am grateful to the editors for inviting me to write this piece and for their suggestions. This article benefited greatly from the multiple readings and counsel of Kara Hannula; my special thanks to her.

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²¹Reconciling the continued predominance of SCT in light of contradictory evidence alongside G&H's clear, uncompromising theory is difficult. I hope this fascinating (to me) topic is addressed by sociologists or historians of science.

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