


Determined Yet Dehumanized: People Higher in Self-Control Are Seen as More Robotic

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Abstract

Desire is part of human nature, and being vulnerable to desire is part of what differentiates humans from machines. However, individuals with high self-control—who demonstrate impressive resistance to their desires—may appear to lack such human vulnerability. We propose that people perceived as high in self-control tend to be dehumanized as more robotic, relating to potentially negative social consequences. Across six studies ($N = 2,007$), people perceived those higher in self-control as more robotic. In addition, we found some evidence that this robotic-dehumanization was related to less interest in spending time with the high self-control person. This outcome was reliably linked to lower warmth perceptions that correlated with greater robotic-dehumanization. Together, our results offer new insights into the social dynamics of exhibiting high self-control.

Keywords

self-control, dehumanization, social perception, interpersonal consequences

Imagine a colleague with iron self-control—a person who has their entire day scheduled, down to 5-min increments to eat lunch and run to the bathroom. This person always wakes up early, never allows for distractions from work, and never misses a scheduled gym session. Workers at SpaceX and Tesla could easily identify such a person, as this description lists several known characteristics of Elon Musk (Cain & Roger, 2020; Clifford, 2017; Petch, 2016). According to past research, someone like Musk—who exhibits very high self-control—enjoys high productivity, personal success at school and work, interpersonal benefits such as gaining others' trust (Maszk et al., 1999; Righetti & Finkenauer, 2011; Röseler et al., 2021; Tangney et al., 2004), and success and satisfaction in relationships (Righetti & Finkenauer, 2011; Vohs et al., 2011).

Self-control describes the act of regulating oneself to meet expectations or achieve goals in the face of temptations (Baumeister et al., 2007; Röseler et al., 2021). Perhaps not surprisingly, past research has focused on positive individual and interpersonal outcomes of high self-control, yet the potential downsides of demonstrating high self-control are not well understood (Röseler et al., 2021). One notable exception is the work by Koval and colleagues (2015), suggesting that perceivers inadvertently assume that those seen as high in self-control do not need to exert as much effort to achieve the same goals, and therefore they ask more of high self-control people. In addition, work by Smith et al. (2020) found that those with unlimited

willpower mindsets—beliefs that through exerting self-control you can actually activate more willpower instead of depleting it—received more negative evaluations from their peers. Inspired by these emerging works, we speculate that people who control themselves very well can appear to others as either lacking in, or immune to, normative human needs or desires; therefore, we propose that people high in self-control, compared with those with average self-control (people showing some successes and some failures in self-regulation), are viewed as more robotic.

Desire, Self-Control, and Dehumanization

Desire is part of human nature and differentiates humans from machines. This idea draws from the dual-dimension theory of dehumanization, which posits that when people

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are dehumanized—or seen as less human-like—they are likened either to animals or machines (Haslam, 2006). Animalistic-dehumanization is formed from a lack of perceived “human uniqueness,” where a person lacking the higher order human traits, such as self-restraint or morality, may be seen as animal-like. Meanwhile, mechanistic or robotic-dehumanization results from the perceived absence of “human nature” or emotional responsiveness (Haslam, 2006; Haslam et al., 2007, 2008). A mechanically dehumanized person is seen as lacking more universal traits, which are formed early in human developmental processes, relating to basic and instinctual features, such as desire (Haslam, 2006).

Naturally, people are motivated to fulfill their unsatisfied needs, which sometimes manifest as desires for immediate gratification (Baumeister & Heatherton, 1996; Metcalfe & Mischel, 1999). Whereas delaying gratification can be more beneficial in the long run, indulging in desire is a natural human response (Hofmann et al., 2009, 2012; O’Shea, 2002). This process, either succumbing to temptation or holding out, is determined, in part, by a person’s *self-control*.

Self-control has historically been defined as an ability to suppress and override human impulses (Baumeister et al., 2007; Tangney et al., 2004). Although more recent conceptualizations recognize that active inhibition of desires is not the only way individuals exert self-control (Fujita, 2011; Hofmann & Kotabe, 2012; Milyavskaya & Inzlicht, 2017), self-control is still commonly viewed as overcoming the very desires that make us human (Hofmann et al., 2012).

If the purpose of self-control is to overcome desire, then compared with an average person who shows desire through indulgence every so often, high self-control people—who mostly or only show successes in curbing desire—would appear to be lacking the natural human “weakness” of succumbing to impulse or could appear to have less or no desire at all (i.e., lacking in human nature; Haslam, 2006). For these reasons, we propose that individuals who demonstrate high self-control are more likely to be mechanistically dehumanized and seen by others as robotic.

Potential Social Consequences.

As past dehumanization research suggested, a person seen as less human is more likely to be socially rejected. For example, targets of robotic-dehumanization have been shown to experience reduced prosocial and increased antisocial behavior from others (Bastian & Haslam, 2011; Rudman & Mescher, 2012; Twenge et al., 2003). People tend to be less interested in the dehumanized (e.g., Martinez et al., 2011; Obermann, 2011), offering them less support and protection (Bastian et al., 2011; Leidner et al., 2013; Vaes et al., 2003). Viewed as lacking natural human desire, a person who shows high self-control may therefore elicit less social support and interest from others.

In synthesizing past research on self-control and dehumanization, we propose two hypotheses that we tested across six studies:

Hypothesis 1 (H1): People perceived to have high self-control will be seen as more robotic (i.e., mechanically dehumanized).

Hypothesis 2 (H2): Perceivers will express less willingness to socially connect with a person perceived as high (vs. moderate) in self-control.

Connecting these hypotheses, we explored whether perceptions of self-control were indirectly linked to reduced motivation to socially connect with a person through increased robotic-dehumanization. In addition, we also explored perceptions of warmth and competence. In relation to robotic-dehumanization, theories have suggested that targets lacking socio-emotionality should be seen as less interpersonally warm, but often more competent (e.g., technicians; Haslam, 2006; Li et al., 2014). Indeed, perceptions of high self-control overlap with perceived ability (Baumeister et al., 2007). Thus, we examined whether perceived self-control has a unique impact on dehumanization that is distinct from perceptions of competence. Furthermore, we explored whether the effects of dehumanization on social connection were driven through lower warmth perceptions. Pre-registered hypotheses for these indirect effects are reported in each study’s introduction.

Study Overview

We tested the hypotheses in three sets of studies. In Study 1, we asked participants to identify two acquaintances of different levels of self-control and then measured their perceptions of those acquaintances (e.g., dehumanization) and their interest in spending time with them. In Studies 2 and 3, we manipulated a target person’s level of self-control and measured participants’ perceptions and interest in spending time with them. For each study, we collected both (1) exploratory and (2) pre-registered data, which are represented here as Studies a and b. For ease of comparison and concision, we present statistics of Studies a and b to the left and to the right of the slash, respectively (i.e., 1a/1b), when the results yielded the same conclusion. Together, this research offers varied and complementary tests of the hypotheses, contributing new insights into an understudied social phenomenon that connects the literatures on self-control and dehumanization. Table 1 presents power considerations and sample demographics for all studies.

Studies 1a and 1b

In Study 1, we examined differences in participants’ perceptions and dehumanization of acquaintances by asking them to nominate two people they know in real life. This

Table 1. Sample Demographics and Power Considerations.

Demographic	Study 1a	Study 1b	Study 2a	Study 2b	Study 3a	Study 3b
N	298	351	101	200	401	804
Source of sample	U.S. undergrad students	U.S. adult residents via CloudResearch	U.S. adult residents via Prolific			
Exclusion	33	1	2	4	10	6
	a. Failed attention check only					
	b. Did not follow instructions only	28	n/a	n/a	n/a	n/a
	c. Both a and b	1	n/a	n/a	n/a	n/a
Resulting N (for analyses)	202	321	99	196	391	798
Age	Mean	40.66	34.42	32.66	33.35	36.84
	SD	1.32	12.85	11.99	13.00	13.49
Gender (%)	a. Female	58.9	47.5	46.9	49.4	49.1
	b. Male	40.6	50.5	51.5	48.8	48.8
	c. Nonbinary	0.4	2.0	1.5	1.8	2.2
Race/ethnicity (%)	a. White	69.8	84.8	74.5	70.6	77.8
	b. Asian/Pacific Islander	19.3	6.1	15.8	16.6	7.8
	c. Black/African American	3.0	8.4	1.5	4.9	7.2
	d. Hispanic/Latinx	2.0	n/a	n/a	2.3	1.3
	e. American Indian/Alaskan Native	n/a	3.0	2.0	0.3	0.5
	f. Other	5.0	n/a	n/a	4.3	4.1
Sample size determination and power	n/a	3	3.0	3.1	1.0	1.4
	No a priori power analysis; determined by availability of participants in a semester.	Based on Study 1a, N = 176 to detect a small-to-medium effect (dz = 0.21; $\alpha = .05$; 80% power. Oversampling at the target of 351.	Rule of thumb: 50 per condition ($\times 2$), aiming for 100 total.	Based on Study 2a (d = 1.62; $\alpha = .05$), the minimum sample size was 24 (for 95% power). Oversampling at the target of 200.	Rule of thumb: 50 per condition ($\times 8$), aiming for 400 total.	Based on Study 3a (d = 1.28; $\alpha = .05$), the minimum sample size was 36 (for 95% power). Oversampling at the target of 800.
Sensitivity analysis (Faul et al., 2007): smallest detectable effect with 80% power	A small effect (dz = 0.20; $\alpha = .05$).	A small effect (dz = 0.16; $\alpha = .05$).	A medium effect (d = 0.57; $\alpha = .05$).	A small-to-medium effect (d = 0.28; $\alpha = .05$).	A small-to-medium effect (d = 0.28; $\alpha = .05$).	A small-to-medium effect (d = 0.20; $\alpha = .05$).

Note. In all replication studies, we oversampled to be cautious about potential attrition, exclusions, instability of effect size, and so on. Across studies, we chose to report results after exclusions (i.e., participants who were inattentive or did not follow instructions) for two main reasons: (1) to produce more accurate estimates that are closer to the true effects, and (2) to adhere to the pre-registered analysis plan of exclusion. The overall patterns of results and conclusions across studies were consistent with or without the exclusions, with few minor exceptions. For full transparency, all survey materials and data are provided, and the results of these additional analyses are reported in SOM. In Table 1, descriptives of demographics were based on data after exclusions. A clerical error was identified after data collection for Study 2: Hispanic/Latino was not included as an option in the race/ethnicity question, and no open text response was available to participants. SOM = supplemental online materials.

Table 2. Study 1: Descriptives and Correlations of Key Variables.

Variable	Study	Descriptives				Means differences			Correlations				
		$M_{\text{High-SC}}$	$SD_{\text{High-SC}}$	$M_{\text{Avg-SC}}$	$SD_{\text{Avg-SC}}$	t	p	d	1	2	3	4	5
1. Self-control	1a	4.76	0.48	3.55	0.64	22.67	<.001	1.60	.11	.27**	-.02	.32**	-.05
	1b	4.63	0.80	3.48	0.83	17.01	<.001	0.95	-.12*	.18**	.19**	.71**	.13*
2. Robotic	1a	2.62	1.30	2.22	1.74	3.05	.003	0.21	.11	.26**	-.35**	.25**	-.26**
	1b	2.23	1.30	1.55	0.92	9.58	<.001	0.54	.20**	.35**	-.24**	.16**	-.19**
3. Warmth	1a	5.50	1.30	5.78	1.13	-2.31	.022	0.17	.12	-.25**	.05	.17*	.52**
	1b	5.56	1.41	5.87	1.18	-3.20	.002	0.18	.06	-.19**	.10	.31**	.62
4. Competence	1a	6.36	0.71	5.57	1.01	9.64	<.001	0.66	.46**	.001	.37**	.07	.08
	1b	6.38	0.92	5.60	1.12	11.17	<.001	0.62	.45**	.03	.45**	.26**	.20**
5. Hanging out	1a	3.67	1.16	3.85	1.02	-1.79	.075	0.12	.25**	-.11	.55**	.37**	.11
	1b	3.38	1.26	3.43	1.22	1.18	.240	0.03	.28**	-.01	.50**	.48**	.23**

Note. d = Cohen's d . Values above the diagonal represent correlations between the key variables for the High-SC acquaintance (e.g., self-control_{High-SC} and competence_{High-SC}) and values below the diagonal represent Avg-SC acquaintance correlations (self-control_{Avg-SC} and dehumanization_{Avg-SC}). Values along the diagonal represent the correlations between the High-SC and Avg-SC acquaintances for the same key variable (e.g., warmth_{High-SC} and warmth_{Avg-SC}) and are bolded to increase readability.

* $p < .05$. ** $p < .001$ (two-tailed).

design offered external validity by eliciting real-world experience. To ensure that the primary difference across the two nominated acquaintances was their self-control, we provided participants with examples of extremely high and average self-control behaviors based on descriptions from an existing validated self-control scale (Tangney et al., 2004). Beyond our main hypotheses, we tested an additional mediation hypothesis (pre-registered in Study 1b) that perceptions of self-control would relate to motivation to socially connect via robotic-dehumanization (preregistration, <https://bit.ly/3ig9yGQ>).

Method

For Study 1a, we recruited undergraduates in the United States to participate in an online survey ($N = 202$ for analysis). To increase generalizability of the findings, in Study 1b we recruited a larger, nonstudent sample from CloudResearch for the same study ($N = 321$ for analysis).

Procedure: Self-Control Condition (Within-Subject). In both studies, we asked participants to nominate two real acquaintances—one with “extremely high” self-control (High-SC) and one with “moderate/average” self-control (Avg-SC)—in a counterbalanced order. In the instructions, we defined an acquaintance as an individual who participants “know slightly. . . can be a classmate, co-worker, neighbor. . .” We also adopted the wording from validated self-control scale items as standardized information presented as examples to guide participants’ nominations (e.g., “never misses a long-term goal” for High-SC vs. “is somewhat able to work toward long-term goals” for Avg-SC).¹ See verbatim study instructions in the supplemental online materials (SOM). Participants entered their

acquaintances’ unidentifiable aliases, which were later embedded in questions to reference the respective acquaintance.

As a manipulation check, participants responded to the question, “Overall, what level of self-control do you think [High-SC/Avg-SC] has?” for each acquaintance, from 1 (*none at all*) to 5 (*very much*).

Warmth and Competence Perceptions. Participants rated how warm and competent they believed each of the identified acquaintances were (e.g., “In general, how much of the below qualities [e.g., intelligent, friendly] do you observe in [High-SC/Avg-SC]?”) from 1 (*none at all*) to 7 (*very much*; Fiske et al., 2007; warmth, three items, $\alpha_{\text{High-SC}} = .90/.95$, $\alpha_{\text{Avg-SC}} = .89/.94$; competence, three items, $\alpha_{\text{High-SC}} = .79/.94$, $\alpha_{\text{Avg-SC}} = .84/.93$). These traits have shown connections to crucial social benefits in ample past research (e.g., Becker & Asbrock, 2012).

Robotic-Dehumanization. Participants rated two metaphors that captured how robot-like they perceived each acquaintance: “Indicate the degree to which you think the following words [machine, robot] are descriptive of [High-SC/Avg-SC]” from 1 (*not at all*) to 5 (*very much*; two items per acquaintance; $\alpha_{\text{High-SC}} = .83/.87$, $\alpha_{\text{Avg-SC}} = .67/.84$; Loughnan & Haslam, 2007).²

Social Connection Motivation. We assessed participants’ motivation to socially connect with each identified acquaintance using one item: “If you had the opportunity, to what extent would you be interested in hanging out with [High-SC/Avg-SC]” from 1 (*not at all interested*) to 5 (*very much interested*). We used this as an outcome measure to test a potential social consequence of the level of perceived self-control.

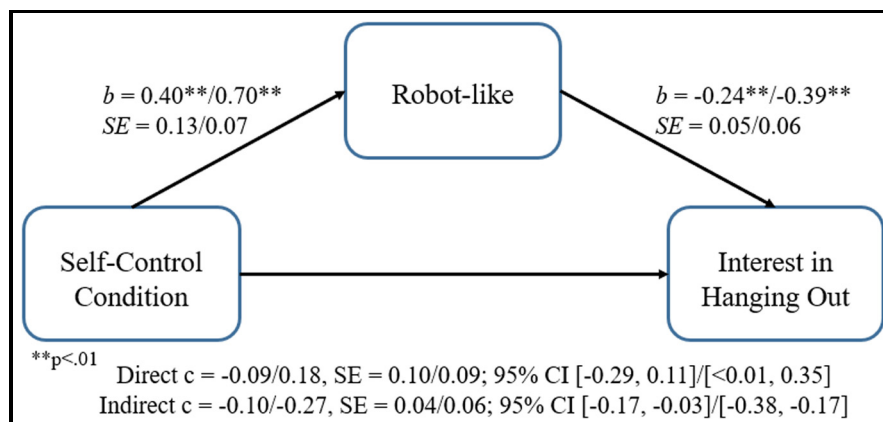


Figure 1. Study 1: Dehumanization Mediation Model.

Note. Statistics of Studies a and b are presented to the left and to the right of the slash, respectively (i.e., 1a/1b). CI = confidence interval.

Results

Descriptive statistics and correlations are shown in Table 2. Manipulation check results suggested that perceived self-control differed in the expected direction in both studies. Participants viewed the High-SC acquaintance as having significantly greater self-control compared with the Avg-SC acquaintance, $t(201/320) = 22.67/17.01$, $ps < .001$.

To test our hypotheses, we first compared robotic-dehumanization perceptions across the two acquaintances. Results from a paired samples t test showed that the High-SC acquaintance was seen as more robotic than the Avg-SC acquaintance, $t(201/320) = 3.05/9.58$, $p = .003/<.001$, which supported Hypothesis 1.

Results showed no statistically significant difference between participants' interests in hanging out with the High-SC acquaintance compared with the Avg-SC acquaintance, $t(201/320) = -1.79/-1.18$, $p = .075/.24$. Although the ratings trended in the expected direction, there was no support for Hypothesis 2.

Mediation. To test whether perceived self-control had a negative indirect relationship with motivation to hang out with the acquaintance, through robotic-dehumanization, we conducted a mediation analysis using MEMORE 2.1 (Model 1; 5,000 bootstrap resamples and a 95% bias-corrected confidence interval; Montoya et al., 2017), and we pre-registered this hypothesis for Study 1b. Results revealed a significant negative mediating effect of robotic-dehumanization (see Figure 1). The difference between the High-SC and Avg-SC acquaintance was associated with more robotic perceptions, which was related to less interest in hanging out with the acquaintance, as seen in Figure 1. Alternative analyses, using perceived self-control ratings (continuous) as the predictor, also yielded similar results (see SOM).

Exploratory Analyses. In SOM, we detail that our results are consistent across alternative analyses and report exploratory analyses that helped identify further mechanisms of the perceived self-control effects; in the following, we highlight the key takeaways from these analyses.

Addressing Competence as a Confound. Conceptually, self-control characteristics may overlap with competence, as the High-SC acquaintance was seen as more competent than the Avg-SC acquaintance, $t(201/320) = 9.64/11.17$, $ps < .001$; thus, perceived competence could have been an alternative explanation for the observed effects. However, additional tests including competence as a control showed no relation between perceived competence and dehumanization, and results indicated that perceived self-control and robotic-dehumanization had a unique relationship that was not formed from perceptions of competence.³

Serial Mediation. The Avg-SC acquaintance was perceived as warmer than the High-SC acquaintance, $t(201/320) = -2.31/-3.20$, $p = .022/.002$. Thus, we explored whether the potential effect of dehumanization on social connection was driven through lower perceived warmth in a serial mediation model (see Figure 2). The conditional difference of self-control (High-SC vs. Avg-SC) on robotic-dehumanization was associated with lower warmth, which was associated with weaker interest in hanging out with the acquaintance. Alternative analyses (1) using perceived self-control ratings as the predictor and (2) controlling for competence yielded similar results, supporting the robustness of the effect. Moreover, the indirect effect seemed to be driven by warmth and not competence as replacing warmth with competence produced weaker serial indirect effects (see Table S2 in SOM). Furthermore, changing the order of the mediators by entering warmth as a mediator before

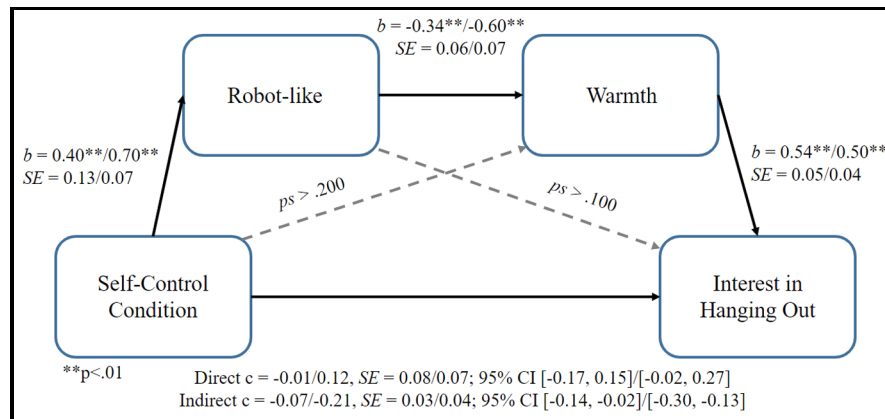


Figure 2. Study 1: Dehumanization and Warmth Serial Mediation Model.

Note. Statistics of Studies a and b are presented to the left and to the right of the slash, respectively (i.e., 1a/1b). CI = confidence interval.

Table 3. Study 2: Descriptives and Correlations of Key Variables.

Variable	Study	Descriptives				Means differences			Correlations			
		$M_{\text{High-SC}}$	$SD_{\text{High-SC}}$	$M_{\text{Avg-SC}}$	$SD_{\text{Avg-SC}}$	t	p	d	1	2	3	4
1. Self-control	2a	4.80	0.53	3.24	0.56	14.13	**	2.84				
	2b	4.78	0.54	3.39	0.60	16.92	**	2.42				
2. Robotic	2a	3.23	1.37	1.39	0.85	8.02	**	1.62	.63**	.96		
	2b	3.28	1.26	1.52	0.70	12.09	**	1.72	.64**	.92		
3. Warmth	2a	3.94	1.11	5.29	0.87	-6.70	**	1.35	-.39**	-.48**	.92	
	2b	4.21	1.27	4.99	0.98	-4.84	**	0.69	-.10	-.28**	.91	
4. Competence	2a	5.88	0.89	5.0	0.95	4.77	**	0.96	.46**	.40**	.05	.87
	2b	5.93	0.93	4.87	0.96	7.91	**	1.13	.68**	.51**	.30**	.88
5. Hanging out	2a	2.60	1.14	3.33	0.92	-3.48	.001	0.70	-.19	-.18	.66**	.25*
	2b	2.97	1.14	3.22	0.78	-1.82	.07	0.26	.08	-.06	.61**	.31**

Note. d = Cohen's d . Values below the diagonal represent correlations between key variables. Values along the diagonal represent the reliability (α) for that measure.

* $p < .05$. ** $p < .001$ (two-tailed).

robotic-dehumanization in the model yielded no significant indirect effects, providing initial evidence that, compared with warmth, dehumanization is a more proximal correlate of self-control perceptions.⁴

Supplemental "Befriending" Item. These studies also included an item to explore long-term social commitment: how much participants were "interested in befriending" the acquaintance. No difference emerged across conditions, $p = .415/.678$. We speculate that this may be due to perceived upsides and downsides (Röseler et al., 2021), such that someone high in self-control may not only be seen as more reliable (a potential benefit in long-term friendship) but also less fun to be around (given robotic-dehumanization). We made no prediction for this item in Study 1b's preregistration, and return to this broader point in the "General Discussion" section.

In sum, Study 1 offered initial evidence to support our main hypothesis: individuals perceived as higher in self-control were viewed as more robotic. There were no total effects of condition on desire to spend time with the acquaintances, but we found indirect effects through dehumanization. Exploratory analyses also revealed a serial indirect effect, suggesting that lower warmth perceptions could be a reason why people are less interested in hanging out with someone who has extremely high self-control—a pattern we sought to replicate in the following studies.

Studies 2a and 2b

Study 1 relied on a correlational design. To provide causal evidence of the effects of self-control on robotic-dehumanization, in Study 2, we manipulated high versus average perceived self-control of a target person and asked participants to report perceptions of this person. Beyond our main

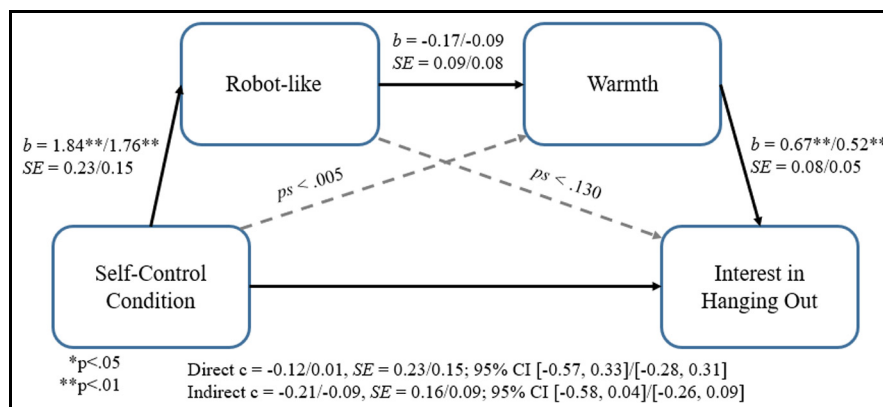


Figure 3. Study 2: Dehumanization and Warmth Serial Mediation Model—Self-Control Conditions.

Note. Statistics of Studies a and b are presented to the left and to the right of the slash, respectively (i.e., 2a/2b). CI = confidence interval.

hypotheses, we examined the serial mediation hypothesis (pre-registered in Study 2b) that perceptions of self-control relate to motivation to socially connect first through robotic-dehumanization and then warmth (preregistration, <https://bit.ly/32Lu8K4>).

Method

We recruited participants from Prolific to complete a short online survey in exchange for US\$.60 ($N_{2a} = 97$, $N_{2b} = 194$ for analysis; see Table 1).

Procedure: High- and Avg-SC Conditions (Between-Subjects). Participants were randomly assigned to either an extremely high (High-SC) or average self-control (Avg-SC) condition. We then told participants to “Imagine a person who holds themselves to an extremely high [average] level of self-control,” and we provided the standardized information used in Study 1 as example behaviors (see SOM).

Using the same measures from Study 1, we then asked participants to rate their perceptions of self-control, warmth, competence, dehumanization, and interest in hanging out with the target person.

Results

Correlations between key variables are shown in Table 3. Manipulation check results suggested that participants in the High-SC condition rated the target person higher in self-control compared with participants in the Avg-SC condition, $t(97/194) = 14.13/16.92$, $ps < .001$ (see Table 3).

We again compared robotic-dehumanization perceptions across the two conditions. Results showed that participants in the High-SC condition viewed the target person as more robotic than participants in the Avg-SC condition, $t(97/194) = 8.02/12.09$, $ps < .001$, which supported Hypothesis 1.

Thereafter, we analyzed the differences in interest in hanging out with the target person. Overall, participants in the High-SC condition were less interested in hanging out than participants in the Avg-SC condition; however, the effect was stronger and significant in Study 2a $t(97) = -3.48$, $p = .001$, compared with Study 2b, $t(194) = -1.82$, $p = .07$. These results provided partial support for Hypothesis 2.

Mediations. In Study 2b, we pre-registered our hypothesis for the serial mediation only, but we conducted and report analyses for both the serial and simple mediations. Consistent with Study 1, we detail various alternative mediation analyses to check robustness and exploratory analyses that clarified other mechanisms in SOM; here, we summarize the key takeaways.

In Study 2, the indirect effect in the simple mediation was nonsignificant when using Self-Control condition as a predictor in the mediation model ($b = 0.08/0.06$, $SE = 0.23/0.14$; 95% confidence interval [CI] = $[-0.42, 0.49]/[-0.22, 0.34]$) and when using self-control perceptions as the predictor ($b = -0.06/-0.13$, $SE = 0.11/0.07$; 95% CI = $[-0.28, 0.15]/[-0.26, 0.01]$).

For the serial mediation hypothesis, we found that the indirect effect was trending negative but nonsignificant when using Self-Control condition as the predictor in the model, as seen in Figure 3. Alternative analyses using perceived self-control ratings as the predictor showed a significant indirect effect of perceived self-control on interest in hanging out for both studies ($b = -0.21/-0.16$, $SE = 0.08/0.05$; see Figure S2 in SOM). When controlling for competence, the indirect effect was slightly stronger ($b = -0.22/-0.19$, $SE = 0.12/0.06$; Figure S1 in SOM). Replacing warmth with competence produced weaker serial indirect effects and switching the order of warmth as a mediator before robotic-dehumanization in the model yielded no significant indirect effects. Thus, the mediation analyses in Study 2b showed consistent patterns but, overall, yielded

Table 4. Study 3: Descriptives and Correlations of Key Variables.

Variable	Study	Descriptives				Means Differences			Correlations			
		$M_{\text{High-SC}}$	$SD_{\text{High-SC}}$	$M_{\text{Avg-SC}}$	$SD_{\text{Avg-SC}}$	t	p	d	1	2	3	4
1. Self-control	3a	4.78	0.54	3.55	0.67	20.24	<.001	2.04				
	3b	4.82	0.49	3.55	0.71	29.32	<.001	2.08				
2. Robotic	3a	2.99	1.29	1.61	0.84	12.64	<.001	1.28	.45**	.87		
	3b	2.81	1.36	1.52	0.79	16.34	<.001	1.16	.46**	.90		
3. Warmth	3a	4.63	1.08	5.17	0.92	-5.31	<.001	0.54	-.07	-.29**	.89	
	3b	4.75	1.11	5.10	0.98	-4.66	<.001	0.33	.05	-.22**	.91	
4. Competence	3a	5.92	0.80	5.30	0.92	7.09	<.001	0.72	.49**	.25**	.32**	.87
	3b	5.98	0.84	5.25	0.95	11.46	<.001	0.81	.60**	.28**	.41**	.87
5. Hanging out	3a	2.77	1.11	3.03	0.96	-2.52	.012	0.25	.07	-.14**	.56**	.30**
	3b	2.90	1.05	2.98	0.93	-1.17	.240	0.08	.16**	-.11**	.57**	.35**

Note. d = Cohen's d .
 ** $p < .001$ (two-tailed).

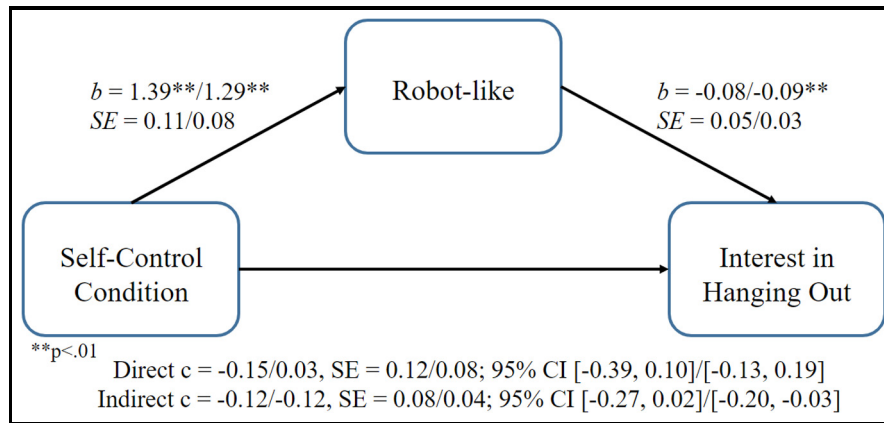


Figure 4. Study 3: Dehumanization Mediation Model—Self-Control Conditions.
 Note. Statistics of Studies a and b are presented to the left and to the right of the slash, respectively (i.e., 3a/3b). CI = confidence interval.

mixed support for the indirect effect of self-control on interest in hanging out.

In sum, Study 2 provided causal evidence to support our main hypothesis that people perceived as high (vs. average) in self-control are perceived higher in robotic-dehumanization. However, we found only partial support for the hypothesis that self-control would affect interest in spending time with the person (for both direct and indirect effects). Although Study 2 offered a straightforward manipulation by using standardized information to elicit self-control perceptions, the materials were arguably sparse and less externally valid. The lack of contextual details might have hindered realism for self-control perceptions to affect social outcomes. We attempted to address these issues in Study 3.

Studies 3a and 3b

In Study 3, we tested our hypotheses using more realistic and contextualized third-person narratives. We created four narratives, including variations in the domains and

behaviors that signaled self-control. Each narrative had two versions, conveying either high or average self-control, for a total of eight possible descriptions. We randomly assigned participants to read one of the eight descriptions and measured perceptions of the target person. Beyond the main hypotheses, we explored both mediation hypotheses (pre-registered in Study 3b) that perceptions of self-control would relate to motivation to socially connect (1) via robotic-dehumanization and (2) via robotic-dehumanization and then warmth (preregistration, <https://bit.ly/34mUDpG>).

Method

We recruited participants from Prolific to complete a short online survey in exchange for US\$.55 ($N_{3a} = 389$, $N_{3b} = 795$ for analysis; see Table 1).

Procedure: *High- and Avg-SC Conditions (Between-Subjects).* Participants were randomly assigned to one of

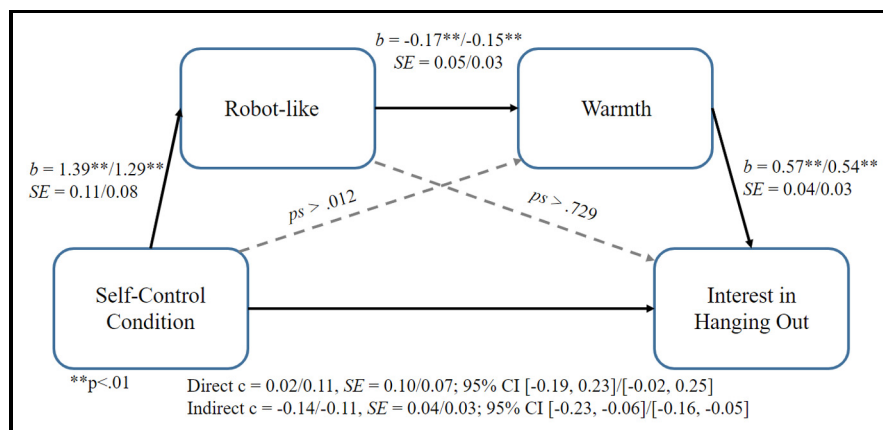


Figure 5. Study 3: Dehumanization and Warmth Serial Mediation Model—Self-Control Condition.

Note. Statistics of Studies a and b are presented to the left and to the right of the slash, respectively (i.e., 3a/3b). CI = confidence interval.

eight Self-Control conditions (four High-SC and four Avg-SC) to read descriptions about a target person (Taylor) who showed either high or average self-control in the context of school, work, health, or personal development. For instance, Taylor “always [sometimes] took careful notes and studied every day [an okay amount].” The descriptions were standardized and gender-matched to the participant (see SOM).

As in Study 2, we then asked participants to rate their perceptions of Taylor’s self-control, warmth, competence, dehumanization, and their interest in spending time with Taylor.

Results

Manipulation Checks. Using multilevel modeling (mixed linear model; Heck et al., 2013), we created null models to examine variance distribution by grouping structures. Results confirmed that a substantial amount of the variance of self-control perceptions resided between conditions (intraclass correlation [ICC] = .52/.52). In contrast, variance due to narrative versions was small (ICC = .005/.007) and below threshold to be considered nontrivial (i.e., .05; Heck et al., 2013). Because perception ratings were consistent across narratives within each of the two main conditions (High-SC vs. Avg-SC), and analyzing the two main conditions (aggregating four descriptions within each), instead of eight separately, yielded the same conclusion, in the main text we followed our pre-registered plan to present the results comparing the two main conditions (see results analyzing the eight conditions separately in SOM). As expected, participants rated the High-SC (vs. Avg-SC) target to have higher self-control, $t(391/798) = 20.70/29.86$, $ps < .001$ (see Table 4).

To test our hypotheses, we first compared robotic-dehumanization perceptions across the two conditions. Participants in the High-SC conditions viewed Taylor as

more robotic than participants in the Avg-SC Conditions, $t(389/794) = 12.64/16.34$, $ps < .001$, which supported Hypothesis 1.

Moreover, participants in the High-SC conditions were less interested in hanging out with Taylor than those in the Avg-SC conditions for Study 3a, $t(389) = -2.52$, $p = .012$, but the effect was nonsignificant in Study 3b, $t(795) = -1.17$, $p = .240$. This provided partial support for Hypothesis 2.

Mediations. As in previous studies, we detail various alternative mediation analyses to check robustness and exploratory analyses that clarified other mechanisms in SOM; here we summarize the key takeaways.

In Study 3b, we pre-registered our simple mediation hypothesis. As seen in Figure 4, the indirect effect was negative and nonsignificant in Study 3a, but was slightly stronger and significant in Study 3b. This effect was significant across alternative analyses: (1) using perceived self-control ratings as the predictor ($b = -0.12/-0.12$, $SE = 0.04/0.02$; Figure S4 in SOM) and (2) controlling for competence ($b = -0.15/-0.16$, $SE = 0.07/0.04$; Figure S5 in SOM), which supported the robustness of this indirect effect.

The serial mediation hypothesis was also pre-registered in Study 3b. As seen in Figure 5, this indirect effect was negative and significant for both studies. Alternative analyses (1) using perceived self-control ratings as the predictor (Figure S6 in SOM) and (2) controlling for competence (Figure S7 in SOM) yielded the same pattern of results, supporting the robustness of the effect. Moreover, the indirect effect seemed to be driven by warmth and not competence as replacing warmth with competence produced weaker serial indirect effects. Furthermore, changing the order of the mediators by entering warmth as a mediator before robotic-dehumanization in the model yielded nonsignificant results, which supported dehumanization as a more proximal correlate with self-control perceptions.

Overall, these results offered support for our serial mediation hypothesis.

Overall, Study 3 further supported our main hypothesis that having higher self-control can cause a person to be seen as more robotic. The evidence for how perceived self-control affected people's motivation to socially connect with the target person was mixed: the manipulation of self-control did not directly change people's interest in hanging out with the target person, but three different analytical approaches provided evidence for negative indirect effects through robotic-dehumanization and warmth.

General Discussion

Whereas past research shows that people high in self-control enjoy a broad range of benefits, these studies demonstrated that being perceived to have high to extremely high self-control can come with potential downsides. Across six studies, we found consistent evidence that High-SC (vs. Avg-SC) targets were more robotically dehumanized. These effects were observed across a range of stimuli, using both within- and between-participant designs. Furthermore, across studies, we found evidence that these effects were distinguishable from effects of perceived competence and warmth, and could not be reduced to perceptions of sociability, likability, or reliability (see SOM for analyses).

Our second set of hypotheses investigated the downstream consequences of this greater robotic-dehumanization of high self-control targets, specifically the extent to which participants were interested in spending time with them. There was limited evidence for a total effect of self-control on desire to spend time with the target directly (Hypothesis 2; significant in two of the six studies). This limited total effect may speak to competing positive and negative effects occurring simultaneously as a function of perceived self-control (e.g., negative warmth and sociability perceptions and positive competence and reliability perceptions; see SOM for further exploratory analyses). There was also limited support for a significant indirect relation between High-SC and interest in socially connecting through robotic-dehumanization (i.e., simple mediation hypothesis; significant in three of the six studies). The most robust mediation model (i.e., serial mediation hypothesis; significant in four of the six studies) provided some evidence that perceived self-control is related to robotic-dehumanization, which, in turn, is related to perceptions of warmth and desire to spend time with the targets. Overall, there was strong evidence that people tended to dehumanize those high in self-control and some suggestive evidence that this could be linked to changes in perceptions of warmth and other negative social outcomes. However, these latter findings still require further exploration.

This research makes theoretical contributions by bridging two segregated literatures: self-control and

dehumanization. In particular, it offers novel evidence to a growing body of work on the social dynamics of being perceived as high in self-control (e.g., Koval et al., 2015). Given that self-control is a desirable human characteristic, those with high self-control could have been seen as ideally human, thereby evoking positive social intentions (e.g., admiration). Instead, our studies demonstrated that perceived high self-control evoked negative perceptions, revealing another way in which evidence of human frailty serves as a point of connection between people.

Future research can begin to examine further why robotic-dehumanization due to self-control occurs. Do people assume that high-self-control individuals have to try less hard (Koval et al., 2015), or are they seen as trying harder despite experiencing the same urges as others? Maybe people believe that they do not even experience said temptations. Exploratory analyses in Studies 2 and 3 (see SOM) suggested that high self-control targets were believed to experience less intense desires and have an easier time overcoming temptation compared with average self-control targets, and that these perceptions were associated with greater robotic-dehumanization. Furthermore, these perceptions of "robot-like" humans may conflict with our understanding of human experience, causing us to feel uncomfortable. Research by Mori et al. (2012) suggests that although anthropomorphized robots share appearances with humans they are not seen as sharing other human characteristics. This violates our expectations, creating an eerie or uneasy feeling (the "uncanny valley"). It may also be that perceivers react to high-self-control people with dehumanization as a form of motivated reasoning (Kunda, 1990) due to upward social comparison. Such possibilities will be interesting to explore through future research.

These studies have interesting implications for the dynamics of perceived self-control in relationships. Past research has generally found upsides of being perceived as high in self-control (Maszk et al., 1999; Righetti & Finkenauer, 2011), and that people tend to rely more on those individuals (Koval et al., 2015). However, our findings suggest that, despite people recognizing that high-self-control individuals may be more reliable, there may also be social costs to being seen as more robotic, which could be associated with fewer positive social rewards. Being viewed as more robotic may relate to being seen as less warm and less likely to want to participate in fun social gatherings, leading to potential exclusion. These studies were conducted entirely in the context of acquaintanceship or first impressions and do not speak to the dynamics of perceived self-control in long-term relationships. However, they do highlight the need to continue to explore both the upsides and downsides of these perceptions. For example, if performance expectations, but not social recognition and support, are greater for employees with high self-control, they could be more vulnerable to health problems such as exhaustion and burnout.

As with any research, these studies are not without limitations. These studies made use of convenience samples from university participation pools and online platforms. Although these factors facilitated our capacity to conduct well-powered studies with rigorous experimental control, they limit the generalizability of the findings. Studies 1a and 1b addressed some concerns about external validity by having participants identify acquaintances from their own life, but future work could employ in-person and field study designs to increase ecological validity. Furthermore, while our studies focused on hypothetical people and acquaintances, future research should investigate whether these effects change, depending on the nature and length of the relationships.

Conclusion

When we think of a person with iron self-discipline, we likely react in both positive and negative ways. Plenty of research has shown the positive individual benefits of high self-control, but very little empirical research has investigated the downsides of these perceptions. Typically, self-control lapses are seen as undesirable, but people's struggles with self-control may also be part of how they are seen as fully human. The findings raise questions regarding the nuanced and even paradoxical nature of human perceptions of self-control and its consequences and indeed the nature of self-control writ large.



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Supplemental Material

The supplemental material is available in the online version of the article.

Notes

1. Extremely high self-control could be considered a defining characteristic of one's personality, compared with typical high self-control. In later studies, we revised the language to reduce the chance that the word "extremely" was driving the result.

2. We also measured animalistic-dehumanization in all three studies. Results of these exploratory analyses can be found in the supplemental online materials (SOM).
3. Similar analyses controlling for warmth were conducted in all studies (see SOM).
4. This effect was observed throughout all three studies (see SOM).

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