

Problematic social media use and academic procrastination: a review of theories and boundary conditions

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Abstract. Problematic Social Media Use (PSMU) is associated with academic procrastination, but this association is not universal, and the conditions under which it holds have not been systematically examined. This narrative review organises the empirical evidence by boundary condition rather than by theoretical account, drawing on Temporal Motivation Theory, a control-theory account of self-regulatory failure, and the I-PACE model. Studies were included only if they measured social media use as the exposure, academic procrastination as the outcome, and the proposed condition as a mediator or a moderator; a condition was retained only if at least three studies met these criteria. Three conditions qualified: low self-control, gender, and low grit. All three are characteristics of the person rather than of the situation, and no situational condition met the criteria. Identifying who is vulnerable would allow academic support to be targeted at the capacities that determine whether use becomes academic procrastination, rather than offered as general advice about reducing screen time.

Keywords: Problematic social media use, academic procrastination, boundary conditions, self-control, grit

1. Introduction

Social media has become a prominent part of daily life. A meta-analysis of 504 studies covering more than two million individuals in 64 countries estimated the pooled global prevalence of social media addiction at 17.4%, with higher estimates in low-income and lower-middle-income countries [1]. Problematic Social Media Use (PSMU) is defined as a maladaptive pattern of use characterised by an inability to control use, withdrawal symptoms when use is curtailed, neglect of other activities, and negative consequences in daily life [2].¹ Its further characteristics include salience, mood modification, tolerance, and relapse, and its most severe form,

¹ This description corresponds to the account of problematic social media behaviour given by the World Health Organization Regional Office for Europe, which reported that 11% of adolescents across 44 countries and regions showed signs of such behaviour in 2022, up from 7% in 2018. World Health Organization Regional Office for Europe. Teens, screens and mental health. 25 September 2024. <https://www.who.int/europe/news/item/25-09-2024-teens--screens-and-mental-health> (accessed 16 September 2026).

identified using the full six-component addiction model, is usually termed social media addiction [2]. PSMU has been associated with a range of negative outcomes, including poorer academic achievement [3] and disrupted daily functioning [2].

Time and attention are limited resources that must continually be allocated between academic work and competing activities [4]. PSMU may therefore significantly affect academic behaviour, for example by contributing to academic procrastination. Academic procrastination is defined as the voluntary delay of an intended course of academic action despite expecting to be worse off for the delay, a definition that excludes strategic delay and general difficulties with planning [5]. Previous research has found an association between PSMU and academic procrastination in samples from several countries, including medical students in Pakistan [6] and college students in China [7].

However, the existing literature has two related limitations. First, the findings diverge. The association is not reported consistently: its strength varies substantially between samples, and in some samples social media use is not directly related to academic procrastination at all [8, 9]. This divergence suggests that the relationship depends on characteristics that differ between individuals rather than holding uniformly. Second, although an association has been established, the conditions under which it emerges have not been systematically examined, so it is not known for whom PSMU is most likely to result in academic procrastination.

To address these gaps, this review draws on three complementary theories: Temporal Motivation Theory [4], a self-regulatory account of procrastination [5], and the I-PACE model [10, 11]. Together, these perspectives guide the investigation of the following questions:

- (1) What mechanisms explain the association between PSMU and academic procrastination?
- (2) Under what conditions is this association strengthened or weakened?

2. Theoretical framework

Three theoretical perspectives are used in this review to explain the association between PSMU and academic procrastination. Temporal Motivation Theory (TMT) explains why a person may be drawn toward social media over academic work at a given moment [4]. A self-regulatory account of procrastination explains why an academic intention may fail to be acted on even when it is recognised as mattering [5, 12]. The I-PACE model explains why this pattern, once established, tends to persist and become increasingly difficult to reverse [10, 11]. Together, these three perspectives address different stages of the same underlying process, rather than three competing explanations of the same event.

2.1. Temporal Motivation Theory

Temporal Motivation Theory [4] explains motivation as a function of four factors: expectancy, value, delay, and impulsiveness. Expectancy refers to a person's belief that an action will succeed; value refers to how much the outcome matters; delay refers to how long a person must wait before the reward arrives; and impulsiveness refers to how strongly a person is pulled toward rewards that are available immediately, at the expense of larger but delayed rewards [4]. Steel [5] applied this framework directly to academic procrastination, showing in a meta-analysis of 691 correlations that task aversiveness, delay, low self-efficacy, and impulsiveness were among the strongest and most consistent predictors of academic procrastination, and arguing that these findings are consistent with a temporal-motivational account.

Applied to the present topic, the four TMT factors map onto the competition between social media use and academic work [4]. The critical asymmetry lies in delay. For many academic tasks, rewards such as grades or

feedback arrive substantially later than the immediate feedback and social rewards available through social media, a difference reinforced by platform features that supply frequent and easily accessible feedback [13]. TMT therefore predicts that academic procrastination becomes more likely when delay to the academic reward is long, when expectancy or value for the academic task is low, and when the person is high in impulsiveness, conditions under which an immediately available alternative such as social media becomes comparatively more attractive [4, 5].

2.2. Control theory and the self-regulatory failure account

Control theory [12] describes self-regulation as a discrepancy-reducing feedback loop. A person holds a goal or standard, compares their current behaviour against that standard, and continues to adjust their behaviour for as long as a gap remains; once their behaviour matches the standard, or the goal is abandoned, the loop is exited [12].

Steel [5] characterised procrastination as a quintessential instance of this kind of self-regulatory failure. A goal (e.g., to do well academically) must first become an intention (study this evening), and an intention must then be carried into behaviour (actually studying), a step at which intentions frequently fail to translate into action [14]. Steel [5] argues that procrastination occurs specifically at this final step, and that it can fail through loss of self-control, loss of attentional control, or avoidance of an aversive task.

Academic procrastination is therefore not primarily a knowledge or planning problem but a breakdown in the feedback process that converts intention into action, a breakdown that becomes more likely under the same conditions identified by TMT: low expectancy, low value, long delay, and high impulsiveness [5].

Applied to the present topic, this account explains why an academic goal may fail to translate into actual study behaviour [5, 12]. A person may consciously choose to check social media despite intending not to (loss of self-control [5]); they may open an application automatically or return to it after being interrupted (loss of attentional control, consistent with the habitual checking reported by Meier et al. [15]); or they may use social media specifically to postpone starting an aversive task (avoidance [5, 16]).

2.3. I-PACE model

The Interaction of Person-Affect-Cognition-Execution (I-PACE) model [10, 11] is a process model developed to explain the onset and maintenance of problematic use of specific internet applications. The model proposes that predisposing person-level variables (e.g., personality traits or psychopathology) interact with affective and cognitive responses to situational triggers, and that these responses are in turn shaped by executive functioning and inhibitory control [11]. Repeated cycles of this process, reinforced through conditioning, are proposed to explain why problematic use becomes increasingly automatic and difficult to interrupt over time [11].

The updated version of the model [10] further emphasises cue-reactivity, craving, and a shift toward more habitual, less deliberate behaviour as problematic use becomes more established. The model is therefore best read not as a linear sequence from person → affect → cognition → execution, but as a set of interacting and mutually reinforcing processes with feedback between stages [10, 11].

Applied to the present topic, I-PACE explains why repeated engagement with social media, once established, may become increasingly automatic and resistant to change, thereby sustaining a pattern of academic procrastination over time [10, 11]. Unlike Temporal Motivation Theory [4] and the self-regulatory failure account [5], each of which explains a single instance of choice or failure, I-PACE explains why this pattern, once it begins, becomes harder to interrupt on later occasions. This process allows an isolated instance of choosing social media over academic work to develop into a recurring pattern of academic procrastination.

Read together, the three accounts are complementary rather than competing, because each addresses a different stage of the same process: Temporal Motivation Theory explains why social media wins a single moment of competition against academic work [4], the self-regulatory failure account explains why an academic intention is not converted into action at that moment [5, 12], and the I-PACE model explains why the pattern becomes progressively harder to interrupt once repeated [10, 11].

Combining them yields a compounding account in which academic procrastination is not the product of a single deficit (e.g., low motivation or weak willpower) but the accumulated result of repeated choices made under conditions that entrench the pattern. This compounding view is the central theoretical contribution of the present review, and it generates the question the next section addresses: if the outcome depends on the conditions under which the choice is repeated, then identifying those conditions determines who is at risk.

3. Boundary conditions: when does problematic social media use lead to academic procrastination

PSMU and academic procrastination are associated [6, 7], and several theories can explain why [4, 11, 12]. However, this association is not universal. Not everyone who uses social media heavily procrastinates on academic work. In one intensive longitudinal study, habitual social media use predicted task delay for only a minority of participants [9]. The more useful question for both theory and practice is therefore not whether the two factors are related, but under what conditions the relationship holds and for whom it is strongest.

Three criteria were applied when deciding which conditions to review. A study had to measure social media use as the exposure, academic procrastination as the outcome, and the proposed condition as a mediator or moderator of that association. A condition was retained only if at least three studies met all three criteria, because a single finding cannot show that a condition replicates. Three conditions met this standard: low self-control, gender, and low grit.

3.1. Low self-control

Self-control is the capacity to override or change inner responses and to interrupt undesired behavioural tendencies rather than act on them [17]. It is measured as a stable individual difference, and those who score low on it show a characteristic pattern: they act on impulses that conflict with a stated goal, they find it difficult to stop an activity once it has begun, and they respond more strongly to immediate rewards than to rewards that require waiting [17]. Low self-control should make it harder to disengage from a rewarding activity such as social media.

Three reasons support treating self-control as a boundary condition:

- Within Temporal Motivation Theory, self-control governs the impulsiveness parameter, which determines how strongly an immediately available reward competes with a delayed one [4]. A person with low self-control assigns disproportionate weight to the immediate reward, so the same level of use should translate into more academic procrastination [4].
- Within the self-regulatory failure account, procrastination occurs at the point where an academic intention must become action [5, 12]. Self-control is what closes that gap [14, 17], so those who lack it should be less able to convert a study intention into action, even when they recognise that the task matters.
- Within the strength model, self-control draws on a limited resource that is depleted by sustained demands [18]. Social media use is continuous rather than episodic [13], so it should consume the regulatory capacity that academic work subsequently requires [18].

Only one study has tested self-control as a condition on the association itself. Üztemur and Dinç [19], in a sample of 370 Turkish middle school students, tested self-control and gender as moderators and found that PSMU positively predicted academic procrastination and that self-control buffered this relationship ($B = -0.11, p = 0.004$). Simple slopes analysis showed that the effect weakened as self-control rose, and that among girls with high self-control it was no longer significant ($B = 0.05, p = 0.319$). The buffering effect was stronger in girls than in boys, and the interaction accounted for 1.19% of the variance in academic procrastination.

Two further studies position self-control on the pathway between the two variables rather than testing it as a condition [7, 20]. Rasouli et al. [20], in a sample of 665 Iranian university students, found that self-control mediated the association between PSMU and academic procrastination. Tang and He [7], in a sample of 825 Chinese college students drawn from 30 provincial-level regions, found that social media addiction predicted academic procrastination through a chain in which lack of self-control led to greater fear of missing out on content on social media, which in turn led to greater academic procrastination.

All three studies are cross-sectional questionnaire studies, so they establish associations rather than causation. Taken together, low self-control is the most stable condition in this review, appearing as either a moderator or a mediator across samples in Turkey, Iran, and China.

3.2. Gender

Gender is recorded in these studies as a self-reported category, and it is the person-level characteristic most frequently tested as a condition in this literature. One reason supports treating gender as a boundary condition, and it concerns impulsiveness. Within Temporal Motivation Theory, impulsiveness weights how strongly an immediately available reward competes with a delayed one [4]. Üztemur and Dinç [19] proposed a gender hypothesis suggesting that male students tend to act more impulsively and are more exposed to PSMU. If male students are, on average, more impulsive, the immediate reward of social media competes more strongly against the delayed reward of academic work for them. The association between PSMU and academic procrastination would then be stronger among male students, which is precisely what a moderation test is designed to detect.

Üztemur and Dinç [19] tested gender directly. The interaction between PSMU and gender was positive and significant ($B = 0.37, p < 0.001$), and simple slopes analysis showed a steeper effect for boys ($B = 0.49, p < 0.001$) than for girls ($B = 0.12, p = 0.001$), with the pattern holding at all levels of self-control; gender accounted for 6.41% of the variance in academic procrastination.

Tang and He [7] found a similar pattern using bootstrapping to compare mediating pathways by gender: all three indirect pathways (through lack of self-control and fear of missing out) were significant for both male and female students, so the mediation operated in both groups, though the study did not test whether the size of these effects differed between the groups. The total effect was nonetheless numerically larger for male students (1.618) than for female students (1.370).

Zubair et al. [21], in a sample of 247 Pakistani nursing students, found that gender significantly moderated the association between social media addiction and academic procrastination ($B = -0.20, p = 0.022$), with a steeper slope for male students ($B = 0.58, p < 0.001$) than for female students ($B = 0.38, p < 0.001$).

Across these three studies, two formally tested gender as a moderator and both found the relationship to be stronger among male students. The third found mediation in both groups and reported numerically larger effects for male students. The evidence therefore points consistently in one direction: male students appear more susceptible to PSMU and, consequently, to academic procrastination.

3.3. Low grit

Grit is sustained interest in and effort towards long-term goals, maintained across months and years rather than moments [22]. It is related to self-control but separable from it: self-control governs moment-to-moment conflicts between an impulse and a goal, whereas grit governs whether a distant goal continues to be pursued at all [23].

One reason supports treating grit as a boundary condition. Within Temporal Motivation Theory, grit corresponds to tolerance of delay, the parameter that discounts the value of a reward according to how distant it is [4]. Academic rewards arrive weeks or months after the work that earns them, whereas social media returns feedback immediately. A person with low grit discounts the academic reward more steeply and is therefore more likely to delay academic work in favour of the immediately available alternative.

Kim et al. [8] tested whether grit mediates the association between social media use and academic procrastination in two independent samples of United States undergraduates (Study 1, $N = 118$; Study 2, $N = 385$), measuring social media use as self-reported frequency of use rather than problematic use. In both samples, social media use predicted lower grit ($\beta = -0.27, p = 0.01$ and $\beta = -0.15, p = 0.02$) and grit predicted less academic procrastination ($\beta = -0.93, p < 0.001$ and $\beta = -0.87, p < 0.001$). The indirect effect through grit was significant in both samples ($\beta = 0.25, 95\% \text{ CI } [0.05, 0.52]$ and $\beta = 0.13, 95\% \text{ CI } [0.02, 0.24]$). Once grit was included, the direct path from social media use to academic procrastination was no longer significant (Study 2: $\beta = 0.07, p = 0.16$), indicating full mediation, although the zero-order correlations were significant ($r = 0.24$ and $r = 0.19$). The authors attribute the absence of a direct path to the distinction between frequent and problematic use.

Li et al. [24], in a sample of 754 Chinese college students, examined the same three variables within a chain model whose final outcome was negative risk-taking behaviour. After controlling for gender and grade, PSMU negatively predicted grit ($\beta = -0.136, p < 0.001$), grit negatively predicted academic procrastination ($\beta = -0.533, p < 0.001$), and PSMU positively predicted academic procrastination ($\beta = 0.175, p < 0.001$). The components of the mediation were present, but the direct path remained significant, so grit did not fully explain the association in this sample. Grit was positioned as a mediator between PSMU and academic procrastination in this model, and both constituent paths were significant, but the indirect effect was not estimated separately.

Ch'ng and Soo Hoo [25], in a smaller sample of 88 Malaysian undergraduates, found that social media addiction predicted lower grit ($b = -0.01, p = 0.040$) and that lower grit predicted higher academic procrastination ($b = -4.34, p = 0.001$). The indirect effect through grit was significant ($b = 0.04, 95\% \text{ BCa CI } [0.01, 0.08]$), while the direct effect of social media addiction on academic procrastination was no longer significant once grit was entered ($b = 0.03, p = 0.369$), indicating full mediation.

Across these three studies in three countries, all three found that social media use predicted lower grit, and that lower grit predicted more academic procrastination, although they disagree on whether grit fully or only partially accounts for the association. None of these studies tested grit as a moderator, and the construct itself is contested, with a meta-analysis finding that its perseverance component overlaps substantially with conscientiousness [26].

4. Conclusion

This review asked under what conditions PSMU leads to academic procrastination. Applying a strict inclusion rule, three conditions met the criteria. Low self-control has the most consistent support, with one study testing it as a moderator and two studies positioning it on the pathway. Gender has three qualifying studies that point

in the same direction: two found that it moderates the relationship, in both cases with a stronger effect among male students, and the third found the mediation to hold in both groups while reporting numerically larger effects for male students. Low grit has three studies across three countries, two of which reported no direct association between social media use and academic procrastination once grit was accounted for.

Two limitations should be noted. First, this review is narrative rather than meta-analytic, so it cannot estimate effect sizes or test for publication bias. Second, the qualifying studies are cross-sectional questionnaire studies drawn from a small number of countries, with Chinese and Turkish samples predominant. They therefore do not support causal claims, and their cultural generalisability is limited.

Future research should test these conditions as moderators rather than mediators, and should use intensive longitudinal designs so that conditions that fluctuate within a person can be examined directly. The practical value of identifying such conditions is that doing so distinguishes those for whom reducing use would help from those for whom the regulatory capacity behind the use is the more appropriate target of support.

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