1. **Hypotheses:**

We predict that greater digital immersion, smartphone use, and addiction will relate to poorer executive functioning, with sleep and body health mediating these links, and sleep moderating associations such that effects are stronger among poor sleepers.

1. **Correlation of all data**

A screenshot of a table

AI-generated content may be incorrect.

Greater digital immersion, smartphone addiction, and objective use were each linked to higher impulsivity. Digital immersion and SAS also predicted poorer sleep and body health, while only objective use was associated with worse attention (Go/No-Go). None showed relationships with Flanker or TEXI-based executive functioning.

1. **Mediation**

| **Mediation Path** | **ACME (95% CI), p** | **ADE (95% CI), p** | **Total Effect, p** | **Prop. Mediated, p** |
| --- | --- | --- | --- | --- |
| Screen → Sleep → Barretts | –0.079 (–0.157, –0.020), .010 | –0.050 (–0.172, 0.070), .404 | –0.129, .064 | 0.61, .066 |
| Screen → Sleep → TEXI | –0.090 (–0.169, –0.020), .016 | 0.079 (–0.052, 0.220), .242 | –0.010, .906 | 8.61, .890 |
| Screen → Body → Barretts | –0.025 (–0.071, 0.010), .210 | –0.101 (–0.226, 0.030), .130 | –0.126, .050 | 0.20, .260 |
| Screen → Body → TEXI | –0.038 (–0.087, 0.000), .060 | 0.029 (–0.113, 0.180), .750 | –0.009, .880 | 4.24, .890 |

Or

| **Mediation Path** | **ACME (95% CI)** | **p (ACME)** | **ADE (95% CI)** | **p (ADE)** | **Total Effect (p)** | **Proportion Mediated (p)** |
| --- | --- | --- | --- | --- | --- | --- |
| Screen → Sleep → Barretts | –0.079 [–0.157, –0.020] | .010 | –0.050 [–0.172, 0.070] | .404 | –0.129 (.064) | 0.61 (.066) |
| Screen → Sleep → TEXI | –0.090 [–0.169, –0.020] | .016 | 0.079 [–0.052, 0.220] | .242 | –0.010 (.906) | 8.61 (.890) |
| Screen → Body Health → Barretts | –0.025 [–0.071, 0.010] | .210 | –0.101 [–0.226, 0.030] | .130 | –0.126 (.050) | 0.20 (.260) |
| Screen → Body Health → TEXI | –0.038 [–0.087, 0.000] | .060 | 0.029 [–0.113, 0.180] | .750 | –0.009 (.880) | 4.24 (.890) |

Sleep significantly mediated the effect of digital immersion on impulsivity (ACME = –0.079, p = .010). For executive functioning, both sleep (ACME = –0.090, p = .016) and body health (ACME = –0.038, p = .060) exhibited negative indirect effects, opposite in direction to their respective direct effects. Body health did not significantly mediate impulsivity (ACME = –0.025, p = .210).

**Moderations on SAS, OBJ**

| **Digital Group** | **Significant Predictors** | **Outcomes Associated with Health Predictors** | **Group Effect (p)** | **Interaction (p)** |
| --- | --- | --- | --- | --- |
| Smartphone Addiction | Body Health (p = .013), Age (p = .124) | Impulsivity (Barretts), Executive Function (TEXI) | ns (.312–.652) | ns (.171–.927) |
| Objective Phone Use | Body Health (p = .006), Age (p = .028) | Impulsivity (Barretts), Executive Function (TEXI) | ns (.284–.755) | ns (.397–.927) |

MANCOVAs and ANCOVAs tested whether sleep or body health moderated links between high/low/no smartphone addiction or objective smartphone use and both behavioral and self-report cognition; sleep and body health consistently predicted better executive functioning and lower impulsivity, but neither digital group differences nor interaction effects were significant.