



Many Labs 3: Evaluating participant pool quality across the academic semester via replication☆



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ABSTRACT

The university participant pool is a key resource for behavioral research, and data quality is believed to vary over the course of the academic semester. This crowdsourced project examined time of semester variation in 10 known effects, 10 individual differences, and 3 data quality indicators over the course of the academic semester in 20 participant pools ($N = 2696$) and with an online sample ($N = 737$). Weak time of semester effects were observed on data quality indicators, participant sex, and a few individual differences—conscientiousness, mood, and stress. However, there was little evidence for time of semester qualifying experimental or correlational effects. The generality of this evidence is unknown because only a subset of the tested effects demonstrated evidence for the original result in the whole sample. Mean characteristics of pool samples change slightly during the semester, but these data suggest that those changes are mostly irrelevant for detecting effects.

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University participant pools provide access to participants for a great deal of published behavioral research. The typical participant pool consists of undergraduates enrolled in introductory psychology courses that require students to complete some number of experiments over the course of the academic semester. Common variations might include using other courses to recruit participants or making study participation an option for extra credit rather than a pedagogical requirement. Research-intensive universities often have a highly organized participant pool with a participant management system for signing up for studies and assigning credit. Smaller or teaching-oriented institutions often have more informal participant pools that are organized ad hoc each semester or for an individual class.

To avoid selection bias based on study content, most participant pools have procedures to avoid disclosing the content or purpose of individual studies during the sign-up process. However, students are usually free to choose the time during the semester that they sign up to complete the studies. This may introduce a selection bias in which data collection on different dates occurs with different kinds of participants, or in different situational circumstances (e.g., the carefree semester beginning versus the exam-stressed semester end).

If participant characteristics differ across time during the academic semester, then the results of studies may be moderated by the time at which data collection occurs. Indeed, among behavioral researchers there are widespread intuitions, superstitions, and anecdotes about the “best” time to collect data in order to minimize error and maximize power. It is common, for example, to hear stories of an effect being obtained in the first part of the semester that then “disappears” in a follow-up study collected at the end of the semester. Beliefs about this variation can be so strong that some laboratories adopt policies to avoid data collection during particular time periods.

Are these concerns warranted? There is some evidence that individual differences among participants vary slightly across the academic semester (Table 1), but there is almost no evidence to indicate whether that variation *on average* has any impact on the detectability and effect magnitudes of correlational or experimental results. We investigated variation in detectability of 10 previously reported effects across 20 participant pools ($N = 2696$) and an online resource ($N = 737$).

1. Time of semester effects: legitimate concern or superstition?

Concerns about time-of-semester effects are not new. The existing evidence supports the belief that participants at the beginning of the

semester are different on average from participants at the end of the semester. However, the differences are modest. For example, later participation in the semester is related to lower levels of conscientiousness (Witt, Donnellan, & Orlando, 2011) and higher levels of openness to experience (Aviv, Zelenski, Rallo, & Larsen, 2002; see Table 1). In addition, individuals who participate late in the semester show lower intrinsic motivation when compared to those who participated earlier (Hom, 1987; Nicholls, Loveless, Thomas, Loetscher, & Churches, 2015).

Research on variation in actual task performance, however, has produced mixed results. For instance, Wang and Jentsch (1998; $N = 49$) asked participants to complete a cued recall task, testing their memory for the English meanings of 24 learned foreign words after a 30-min period. They found no significant difference in cued recall between the earliest and latest participants over the course of four semesters.

In contrast, Nicholls et al. (2015) did find evidence for differential sustained attention across the semester. In their study ($N = 80$), individuals who participated either for course credit or monetary compensation completed hundreds of trials of a reaction time-based number detection task (Sustained Attention to Response Task; Robertson, Manly, Andrade, Baddeley, & Yiend, 1997) at either the beginning or end of the semester. There were no significant differences between course credit participants and paid participants at the beginning of the semester. However, paid participants outperformed course credit participants at the end of the semester, $F(1, 37) = 5.58, p = .024, \eta_p^2 = .131$, possibly related to the latter group's relatively lower levels of intrinsic motivation.

2. Research questions

The present project is informally called “Many Labs 3” as it follows the model established in two prior investigations for conducting the identical procedure in many different laboratories (Klein et al., 2014, 2015). In

Table 1
Correlations between time of semester and Big Five personality traits.

	Aviv, Zelenski, Rallo, & Larsen (2002; using NEO-PI R; $N = 257$)	Witt et al. (2011); using IPIP-NEO; $N = 512$)
Agreeableness	-.11	-.10
Conscientiousness	-.14	-.20
Extraversion	.19	.02
Neuroticism	-.11	-.08
Openness	.14	-.01

Note: Values represent Pearson's r between personality trait and week of participation.

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