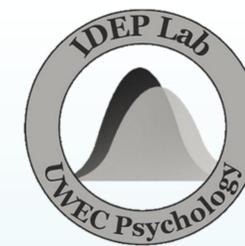# The *g* in Grammar:
Grammar Usage is an Indicator of General Cognitive Ability

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FINDING 1: PEOPLE ATTEND TO GRAMMAR USAGE AS AN INDICATOR OF OTHERS' COGNITIVE ABILITY

In a recent study out of our lab (Bleske-Rechek et al., 2019), we asked members of the community to review a hypothetical job applicant's cover letter and then evaluate the applicant. The *content* of the cover letter spoke to an applicant with strong experience and high levels of motivation. Unbeknownst to participants, however, the cover letter they reviewed came in three different versions: zero grammar usage errors, a typical rate of grammar usage errors (2/100 words), or a high rate of errors (4/100 words).

☐ 0 Errors   ☐ 2 Errors/100 Words   ☐ 4 Errors/100 Words

Note. Error bars represent ±2 SEM.
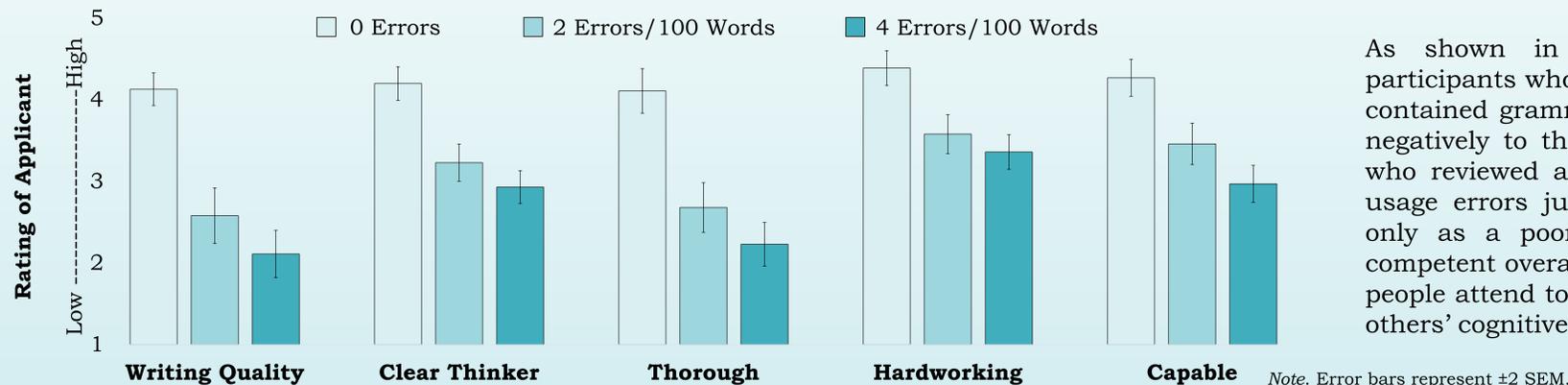
As shown in the graph to the left, participants who reviewed a cover letter that contained grammar usage errors responded negatively to the job applicant. Individuals who reviewed a cover letter with grammar usage errors judged the job applicant not only as a poor writer, but also as less competent overall. These findings imply that people attend to grammar as an indicator of others' cognitive ability.

## FINDING 2: GRAMMAR USAGE, LIKE *g*, IS QUITE STABLE AND UNRESPONSIVE TO SHORT-TERM INTERVENTION

Grammar usage has a history of being relatively immune to instruction (Bean, 1996; McQuade, 1980). During the 2017-18 academic year, we attempted to improve a group of students' grammar usage by implementing interleaved practice (see Dunlosky et al., 2018) with ten specific types of grammar usage errors (Bleske-Rechek, 2018). We aimed to increase students' ability to identify and correct common grammatical usage errors. These "Intervention" students took a 20-sentence pretest on their grammar usage, underwent 10 weeks of "Sentence of the Day" practice with grammar usage, and then took a 20-sentence grammar usage post-test. Students from a different course also completed the post-test to serve as a comparison group.

Note. Error bars represent ±2 SEM.
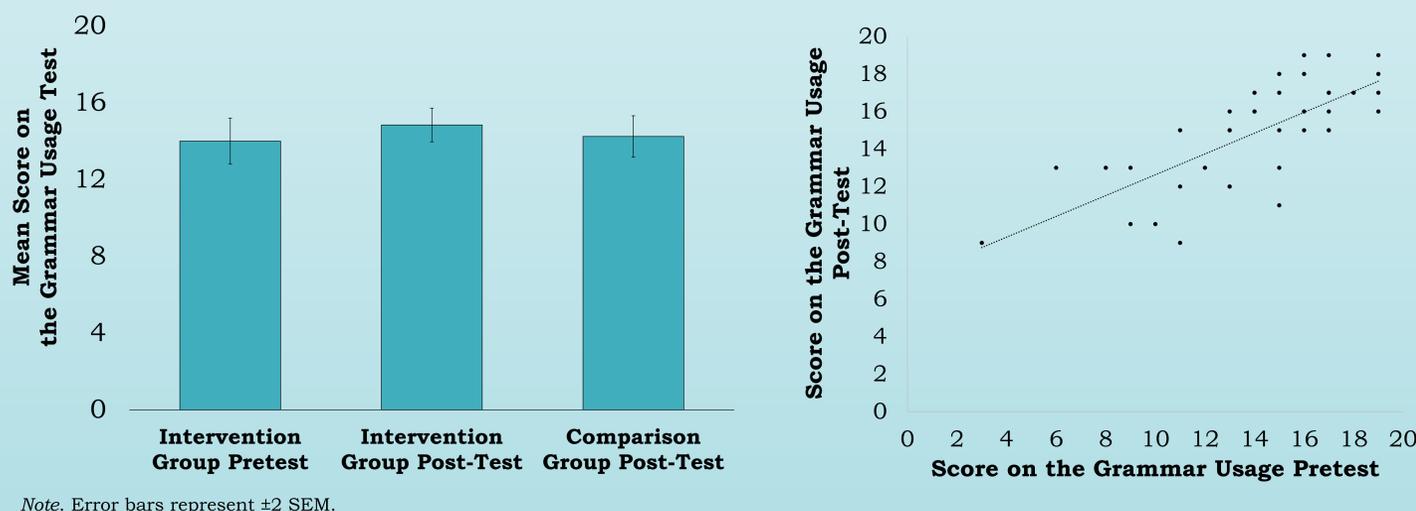
As shown in the bar graph, students in the intervention group performed reliably better on the grammar usage post-test than on the pretest, $t(37)=2.07$, $p=.046$. However, the effect was weak ($d=0.34$), and the intervention students did not outperform the comparison group on the post-test, $t(74)=-0.86$, $p=.391$. Thus, even using evidence-based teaching strategies like interleaving, grammar usage was relatively immune to intervention. The scatter plot at left shows that intervention students' performance on the pretest was highly correlated with their performance on the post-test, $r(37)=.74$, 95% CI [.55, .86], $p<.001$. Such consistency suggests that, like *g*, grammar usage is highly stable over time.

FINDING 3: GRAMMAR USAGE, LIKE *g*, PREDICTS ACADEMIC LEARNING

The students who underwent the grammar usage "intervention" during the 2017-2018 academic year were students in a psychology research methods course. In this course, writing is quite minimal, as the primary foci are analytical thinking (scientific mindedness, causal versus non-causal claims) and probabilistic reasoning (statistical inference). Students' performance on the 20-sentence grammar usage pretest, which took just 5-10 minutes to complete, was a strong predictor of students' performance in Research Methods, $r(39)=.47$, 95% CI [.18, .68], $p=.003$.
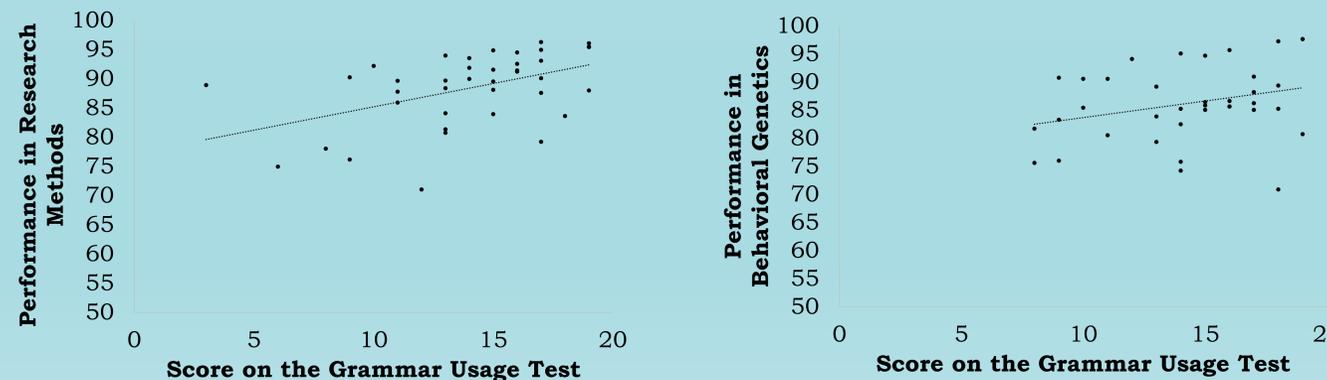
The students in the comparison group who took the 20-sentence grammar usage post-test were students in an upper level psychology course, *Individual Differences and Behavioral Genetics*. Like research methods, writing is not emphasized in this course, but logic and statistical reasoning are. Despite strong selection bias into this course and hence restricted range, students' scores on the grammar usage test still correlated moderately with students' performance on course exams, $r(37)=.29$, 95% CI [-.04, .54], $p=.083$.

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