INTRODUCTION
The requirement to select and execute a response that is incompatible with the truth is a necessary component of all deceptions. By virtue of their role in controlling and coordinating the selection and execution of willed actions, the executive processes used to implement cognitive control play an essential role in deceptive responding. Such processes include those that automatically and continuously monitor actions for conflicting response tendencies and errors (i.e., tactical monitoring), as well as those responsible for adjudicating the conflicting response tendencies in favor of the deceptive response and inhibiting the prepotent truthful response. In addition, we have shown that some deceptions also require longer-term (i.e., strategic) monitoring processes to ensure that selected responses conform to one’s overall plans and goals. To understand better the cognitive and neural basis of deception, we have conducted a series of studies in which participants made deceptive responses about their episodic memories (Johnson et al., 2003, 2004, 2005) and attitudes (Johnson et al., 2008).

To extend these results to another type of highly self-relevant evaluative judgments, participants made truthful and directed lie responses about whether trait adjectives (e.g., honest, liar, messy, neat) described themselves while their ERP activity was recorded. We hypothesized that truth evaluations would produce similar, but more exaggerated, changes in measures of behavioral and brain activity compared to deceptions about less “central” self-related information.

METHODS
PARTICIPANTS
• 21 right-handed, native-English speakers (16 females) were paid $10/hour
• Age range = 20-35 years; mean age = 23.6 years (S.D. = 4.1)
• Average education = 15.2 years
• Written informed consent obtained prior to experiment
• 2 participants were dropped due to non-compliance with instructions, evidenced by RT reversals between regular and catch trials.

PROCEDURE
Approximately one week (mean = 8.2 days, S.D. = 5.5) prior to the ERP recording session, participants rated 285 trait adjectives on:
1. Whether each described themselves (1 = never, 6 = always) and
2. On how important is the fact that this trait does/does not describe you to who you are as a person? (1 = not at all important, 6 = very important).

Individualized stimulus files were created using the highest and lowest ranked traits (like me 5-6; not like me 1-2), which also had the highest importance ratings, to obtain 24-40 items per category.

ERP RECORDINGS
• 83 scalp sites, referred to A1 (re-referenced to A1+A2)
• Electrodes were located in rings spaced at 11.25% of vertex-nasion distance, with an extra ring at the pre-auricular point level
• Bandpass = 0-35 Hz
• Sampling rate = 100 Hz
• Sampling epoch = 2150 ms (including 150 ms baseline)
• Averages include correct trials, with rejection of EOG trials and other artifacts

RESULTS—BEHAVIORAL

Although overall accuracy was high, Directed Lie responses were less accurate than Truthful responses on regular trials (p < .0005), but not on catch trials (F < 1).

RESULTS—RESPONSE-LOCKED ERPS

The late positive component (LPC) was smaller for deceptive responses, likely due to extra executive processes acting like a secondary task.

DISCUSSION
We extended our previous results by showing that the same brain processes are used for deceptions about another type of evaluative response; whether particular trait adjectives apply to oneself. Again, we found that the RT delay for deceptive responses was much greater for evaluative responses than for deceptions about more memory-based responses.

The use of strategic monitoring processes here, as indexed by the pre-response negativity, was much greater than we have observed previously, a result in accord with the idea that responses about these types of items are made to conform to one’s overall plans and goals. Across studies, our results also show that the magnitude of the PRN is related to the importance of the stimulus being lied about.

Similarly, the post-response MNF, which reflects the amount of conflict generated by the response, was larger for deceptive responses than for truthful responses. In accord with our previous results, the amplitude of the parietal LPC decreased for deceptive responses, a result we have interpreted as indicating that deceptive responses require effort (i.e., additional processing resources) and thus amounts to secondary task (e.g., responding deceptively) (see Johnson, 1986, 1988 for reviews).

Our results demonstrate that making even simple, directed lies, about trait evaluations resulted in quantitatively and qualitatively different patterns of behavioral and brain activity. Quantitatively, these deceptions produced much greater levels of monitoring and conflict, signaling that they required greater cognitive control than is necessary for deceptive responses about other types of more memory-based stimuli. Qualitatively, trait evaluations were different from other tasks in that they appeared to invoke greater amounts of strategic monitoring processes prior to both truthful and deceptive responses, even in the absence of any task requirement to do so. Thus, these results confirm our findings for attitudes and suggest that deceptions about self-referential evaluations are fundamentally different from deceptions about personal memories or perceptual events.

REFERENCES

http://brainlab.psych.qc.cuny.edu