

Background

- The P100 event-related potential (ERP), elicited by the visual evoked potential (VEP) paradigm, has been shown to differ between autistic individuals and those with attention-deficit/hyperactivity disorder (ADHD)¹.
- Autistic children with co-occurring ADHD have demonstrated a smaller P100 amplitude than children with ADHD or autism spectrum disorder (ASD) alone².
- However, previous research used a small sample size and relied only on parent-report of ADHD symptoms.

Objectives

- Examine the relationship between parent-reported ADHD symptoms, experimenter-coded attention, and P100 latency and amplitude in a large multisite sample of autistic children.

Methods

Participants

- Data from 236 autistic children aged 6-11 years old with IQ \geq 60 (Table 1) was collected through the Autism Biomarkers Consortium for Clinical Trials (ABC-CT).

Clinical Measures

- ADHD symptoms were measured via parent-report on the Child & Adolescent Symptom Inventory-5 (CASI-5).
- Autism symptoms were quantified using the Autistic Diagnostic Observation Schedule, Second Edition (ADOS-2) Comparison Score.
- IQ was measured using Differential Abilities Scale-II (DAS-II).

Table 1. Participant Demographics

	n = 236	M	SD
Age		10.38 years	1.80 years
DAS-II IQ		101.78	23.14
CASI-5 Inattention T Score		72.55	12.43
CASI-5 Hyperactive-Impulsive T Score		16.16	14.29
ADOS Comparison Score		7.59	1.81
Sex	n (%)		
Male	181 (77%)		
Female	55 (23%)		

Experimental Procedures

- Participants viewed 200 trials of the VEP paradigm, which consisted of 20x20 square black-and-white chessboards that reversed phase every 500-ms while electroencephalogram (EEG) data was recorded concurrently.

Methods

EEG Acquisition and Analysis

- EEG data were recorded using 128-channel HydroCel Geodesic Sensor Nets at 1000Hz. Trials with artifacts were excluded from analysis.
- Amplitude and latency of the P100 was calculated at occipital sites (Fig. 1). All peaks were visually inspected for accuracy.
- During the EEG session, the experimenter coded off-task behaviors: participant talking, moving, inattention to the stimulus presentation, or the behavioral assistant redirecting the child.
- Percentage of time in which the child was engaged in off-task behavior was calculated.

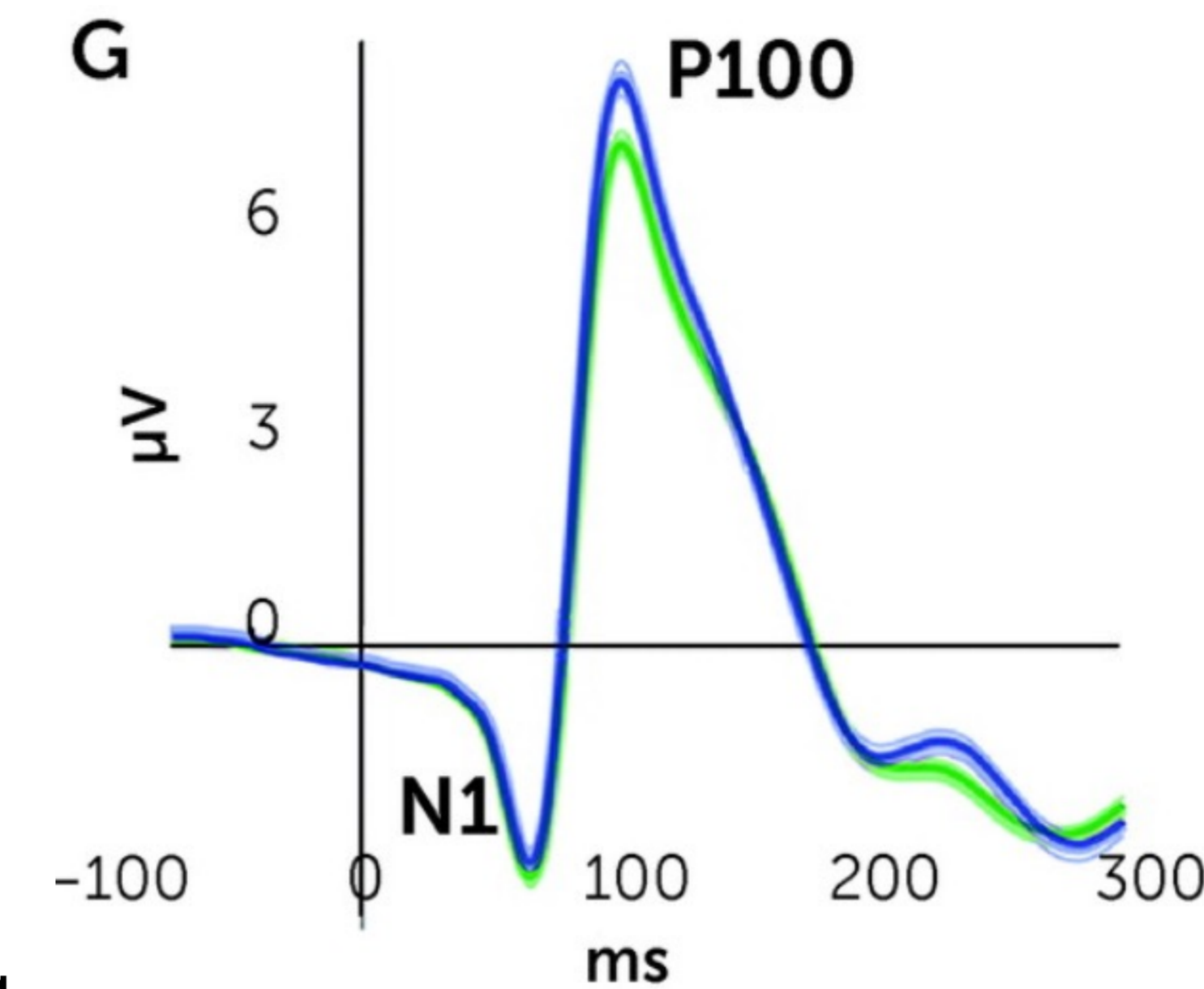


Figure 1. Representative grand-average P100 to VEP from the ABCCT study (green=ASD; blue=TD)³.

Analysis

- Correlations were conducted to examine relationships among ADHD symptoms, autism symptoms, off-task behavior, and P100 latency and amplitude.
- Multiple regression was used to examine the relationship between off-task behavior and the P100 ERP while controlling for autism symptoms.

Results

Off-Task Behavior

- More off-task behavior was significantly associated with smaller amplitude (Fig.2) ($r=-0.13$, $p=0.04$) and longer latency (Fig.3) ($r=0.13$, $p=0.04$) of the P100.

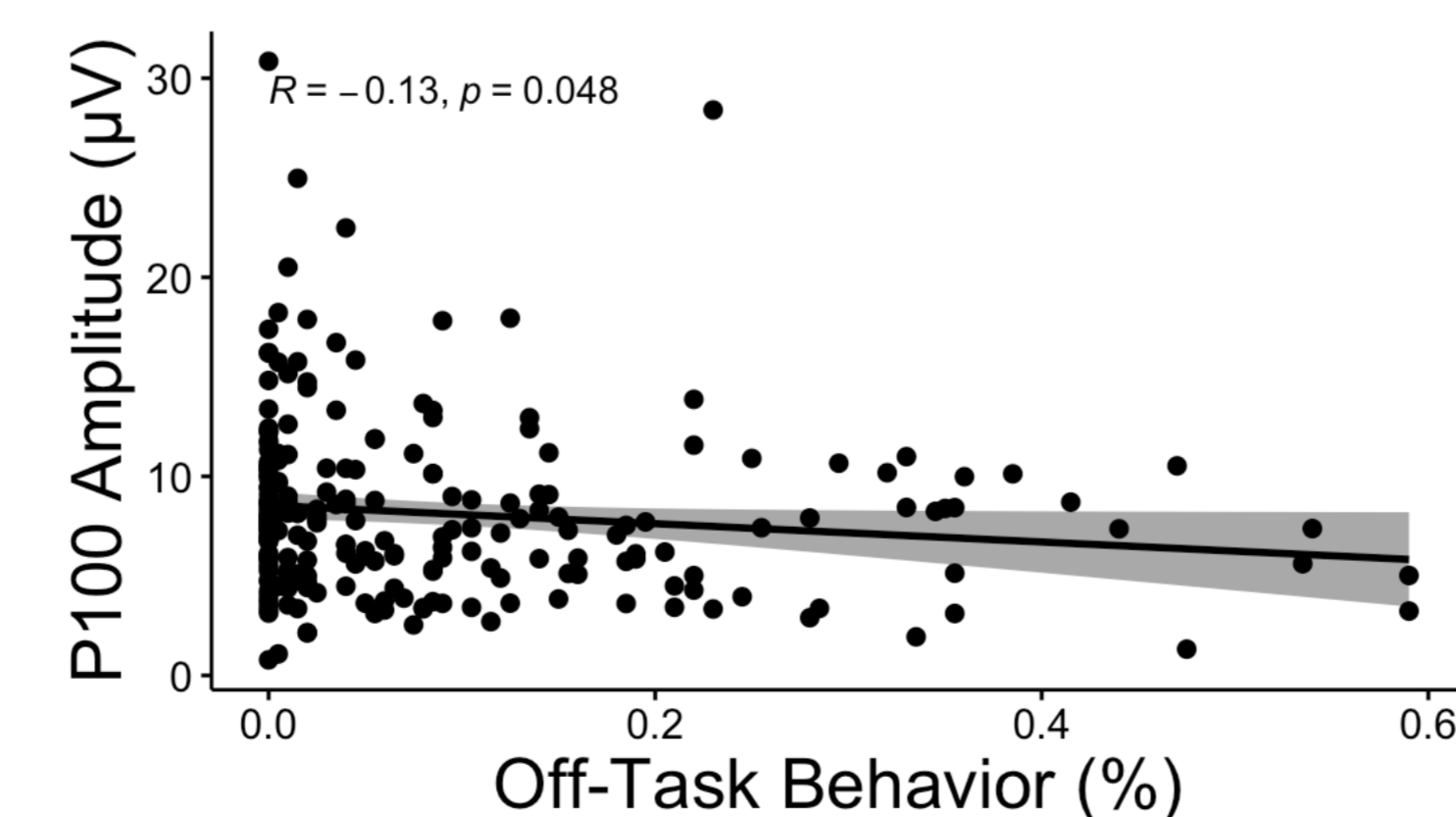


Figure 2. Relationship between off-task behavior during EEG session and P100 amplitude.

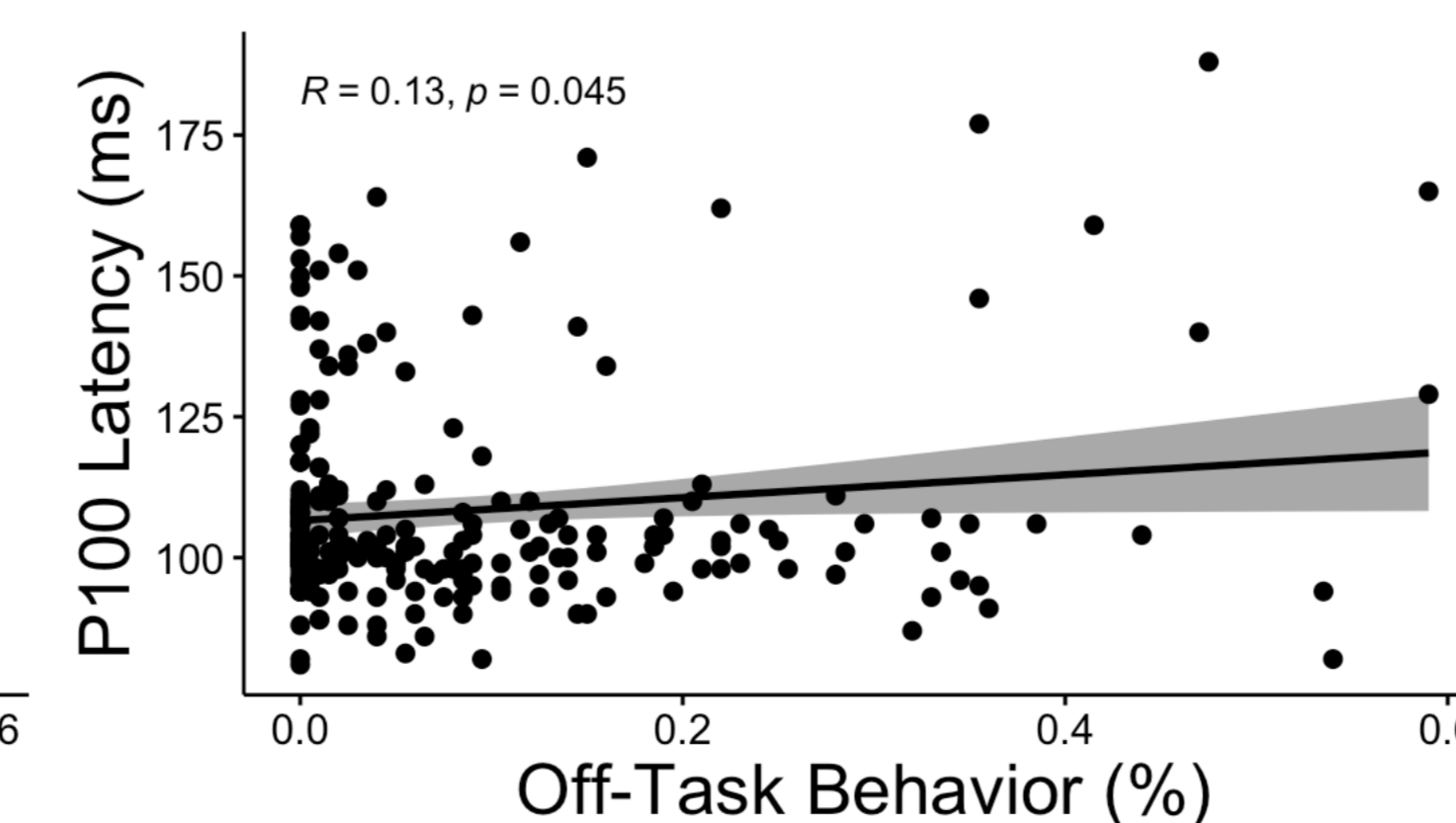


Figure 3. Relationship between off-task behavior during EEG session and P100 latency.

Results

Autism and ADHD Symptoms

- Increased autism symptoms were associated with more off-task behavior (Fig.4) ($r=-0.21$, $p<0.01$).
- Increased off-task behavior significantly predicted longer P100 latency ($\beta=19.66$, $p=0.05$), but not P100 amplitude ($\beta=-3.88$, $p=0.10$), while controlling for autism symptoms.
- Autism and ADHD symptoms did not correlate with P100 amplitude or latency (p 's >0.09).

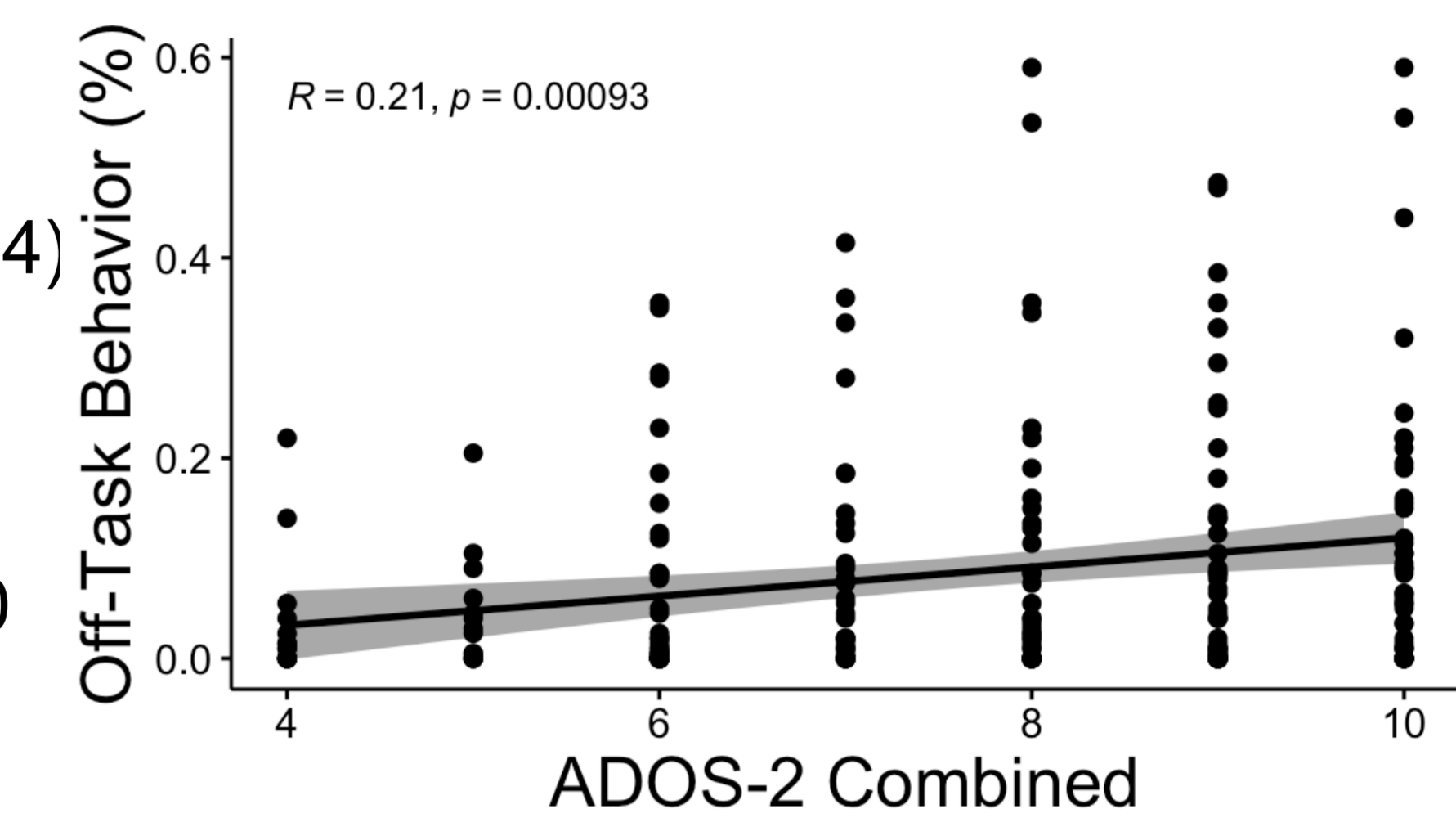


Figure 4. Relationship between autism symptoms and on-task behavior.

Conclusions

- Parent-report of ADHD symptoms was not significantly associated with P100 amplitude and latency.
- Behaviorally-coded off-task behavior was correlated with both, even when controlling for autism symptoms.
- The findings did not reflect expected differences in ERPs of autistic children with more parent-reported ADHD symptoms⁴.
- Results suggest that an in vivo behaviorally coded measure of off-task behavior captured unique variance related to visual processing in autistic youth.
- In the future, including other measures of ADHD symptoms may help to further parse the heterogeneity in this population.

References

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- Statistical symbols are italicized
- P values are reported in a consistent way (e.g., $P=X$ or $p<X$)
- P values are reported to a consistent number of decimal points (but don't use $p=.00$, since that is impossible!)
- Spaces are consistently used/not used between statistical notations (e.g., $t=2.70$ vs. $t = 2.70$) – both are OK, and the former can save space
- All graphs have x and y axis labels
- Try to use similar units and range on graphs. This is especially important if graphs are using the same instrument.
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- Figures are labeled and referenced in text (e.g., Figure 1)
- All graphs have a legend
- All fonts are sufficiently large to be visible (greatest risk for figures). Make powerpoint actual size on screen and confirm it will be legible from about three feet away.
- Grant support is acknowledged
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- All acronyms are defined. Once you have defined the acronym use it consistently.
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- DEL logo is top left
- YCSC or ABC-CT (for ABC-CT data) logo is top right
- McPartland Lab is identified
- Lab email address and website are somewhere on the poster
- If you are presenting ERP data, a waveform should be displayed
- Components under study should be labeled on the waveform
- If possible, include a schematic indicating the electrodes from which DVs were extracted
- For charts and figures, be sure your colors will be distinguishable if printed on a gray scale printer
- For charts and figures, be sure your lines are thick enough and colors dark enough to be visible at poster viewing distance under potentially suboptimal lighting conditions
- Use past tense in methods and results because you are referring to procedures that have already taken place. Usually in conclusions to (when summarizing results), but not necessarily if you are speculating about stuff not specific to the study