Executive Function Expiration Date: 06/30/2015

Name of test: Flanker Inhibitory Control & Attention Test

Estimated time burden: 7 minutes **Estimated number of items:** up to 48

<u>Materials:</u>

iPad

Description:

The Flanker Inhibitory Control & Attention Test was developed based on work by Rueda and colleagues (2004) and provides a measure of inhibitory control and attention. The Flanker requires the participant to focus on a given stimulus while inhibiting attention to stimuli flanking it. In this version of the task, participants see a picture of a fish flanked by two other fish on either side. On congruent trials, all the fish are pointing in the same direction. On the incongruent trials, the flanker fish are pointing in the opposite direction of the central fish. Congruent and incongruent trials are intermixed in the block of standard trials. A prerecorded voice says "MIDDLE" to remind participants to focus on the MIDDLE stimulus. Participants are instructed to choose one of two "buttons" on the screen that corresponds to the direction in which the MIDDLE fish is pointing.

All the instructions are on the screen. The examiner reads them to and/or with the participant and points out the relevant aspects of the stimuli on the screen To prevent inadvertent screen advancement by children, a touch-and-hold button will be implemented that will require a 1-second hold by the examiner to activate and advance the screen.

Practice Trials:

For all participants, there are four practice trials. If the participant responds incorrectly, the examiner prompts him/her to choose the correct button. If the participant does not respond after 5 seconds, prompt him/her to do so by saying, "Choose one of the buttons."

The participant must get at least 3 out of 4 practice trials correct to advance to the test trials. If a participant gets fewer than 3 out of 4 practice trials correct, he/she will complete a second set of 4 practice trials, with the same criterion required to advance to the test trials. If the participant does not meet the criterion on the second set of practice trials, the downward extension (Dext) part of the task will begin.

The Dext setup is illustrated below. If a participant gets at least 3 out of 4 practice trials wrong on both sets of the Flanker Practice, or if they answer less than 6 incongruent trials correctly on the Toolbox Flanker Fish phase (after successfully passing the Flanker Practice), Dext begins. In Dext, the concept of a *middle* fish is highlighted through different colors of the middle versus tghe flanking fish, and an increase

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OMB #: 0925-0661 OMB #: 0925-0661 in spacing between the middle and the flanking fish occurs, to help draw children's attention to the middle fish. The color and the spacing gradually morph into the standard Flanker Fish, as illustrated below.

Pass [≥3/4 correct, either try] Pass [≥ 6 incongruent] Start: Flanker Practice Toolbox Flanker Fish Toolbox Flanker Arrows 2 congruent; 2 incongruent 13 congruent; 7 incongruer 13 congruent; 7 incongruen 2 tries to pass Fail [< 6 incongruent STOP! Fail [< 3/4 correct both tries] Toolbox Flanker Fish 2 congruent: 3 incongruent Color 2 congruent; 3 incongruent Size/Color 2 congruent; 3 incongruent Spacing/Size/Color 2 congruent; 3 incongruent

Flanker!with!Downward!Extension!

Test trials:

There is one block of 20 fish test trials for all participants. If a participant misses no more than 1 congruent and 1 incongruent trial, he/she will also receive a set of 20 arrow test trials.

The table below outlines the item content and the actions for the examiner:

| Phase | Screen - written content | Examiner Action |
|--------------|---|-------------------------|
| PRACTICE | Here is a Fish! | Examiner points to the |
| Introduction | This is the TAIL -> [fish] <- This is the MOUTH | relevant parts on the |
| | The fish is pointing this way, the same way the fish is | screen and then touches |
| | swimming. | the touch-and-hold |
| | | button to advance to |
| | | next screen. |
| | Here the MIDDLE fish is circled. Can you point to the | Child points and |
| | MIDDLE fish? | examiner touches the |

| Phase | Screen - written content | Examiner Action |
|-------------------|---|-------------------------|
| | | touch-and-hold button |
| | | to advance to next |
| | | screen. |
| | Where is the MIDDLE fish here? | Child points and |
| | | examiner touches the |
| | | touch-and-hold button |
| | | to advance to next |
| | | screen. |
| | Look at all the fish!!! The fish in the MIDDLE is hungry. | Examiner touches the |
| | | touch-and-hold button |
| | | to advance to next |
| | | screen. |
| | To feed the MIDDLE fish, choose the button that | Examiner demonstrates |
| | matches the way the MIDDLE fish is pointing. | using the index finger. |
| | If the MIDDLE fish is pointing this way, choose this | Examiner demonstrates |
| | button. | using the index finger. |
| | If the MIDDLE fish is pointing this way, choose that | Examiner demonstrates |
| | button. | using the index finger. |
| | Sometimes all the fish face the same way. Sometimes | Examiner points and |
| | the MIDDLE fish faces a different way from his friends, | then chooses button. |
| | like this: [picture of incongruent fish] | |
| | You should always choose the button that matches the | |
| | way the MIDDLE fish is pointing. You will hear and see | |
| | the word MIDDLE to remind you. | |
| | Here the MIDDLE fish is pointing this way, so I'll | Examiner points and |
| | choose this button. | then chooses button. |
| | Here the MIDDLE fish is pointing this way, so I'll | Examiner points and |
| | choose this button. | then chooses button. |
| Transition to | Now you try. | Examiner touches the |
| practice items | Keep your eyes on the star in the middle of the screen. | touch-and-hold button |
| | Remember: put your finger back on HOME BASE after | to advance to next |
| | you answer. | screen. |
| | 4 practice items for the participant. | |
| More practice, if | Let's practice some more. If the MIDDLE fish is | Examiner points and |
| needed. | pointing this way, choose this button. | then chooses button. |
| | | |
| | If the MIDDLE fish is pointing this way, choose that | Examiner points and |
| | button. | then chooses button. |
| Transition to | Now you try. | Examiner touches the |
| more practice | Keep your eyes on the star in the middle of the screen. | touch-and-hold button |
| items | Remember: put your finger back on HOME BASE after | to advance to next |
| | you answer. | screen. |
| | 4 practice items for the participant. | |
| More practice | | |
| More practice, if | Let's practice some more. If the MIDDLE fish is | Examiner points and |

| Phase | Screen - written content | Examiner Action |
|-------------------|---|-----------------------|
| | If the MIDDLE fish is pointing this way, choose that | Examiner points and |
| | button. | then chooses button. |
| Transition to | Now you try. | Examiner touches the |
| more practice | Keep your eyes on the star in the middle of the screen. | touch-and-hold button |
| items | Remember: put your finger back on HOME BASE after | to advance to next |
| | you answer. | screen. |
| More practice | 4 practice items for the participant. | |
| Test Items | Now you're ready to do this without me. | Examiner touches the |
| transition | Keep your eyes on the star in the middle of the screen. | touch-and-hold button |
| | Remember: put your finger back on HOME BASE after | to advance to next |
| | you answer. | screen. |
| | | |
| Test items | 20 items (fish) | |
| Introduction to | Now you will do the same thing, but you will see | Examiner touches the |
| additional test | arrows instead of fish. | touch-and-hold button |
| items if missed | Keep your eyes on the star in the middle of the screen. | to advance to next |
| no more than 1 | Remember: put your finger back on HOME BASE after | screen. |
| congruent and 1 | you answer. | |
| incongruent trial | | |
| Additional test | 20 test items (arrows) | |
| items | | |

Sample screenshot (fish):

