EXECUTIVE FUNCTIONS IN AGGRESSIVE PRESCHOOLERS

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ABSTRACT

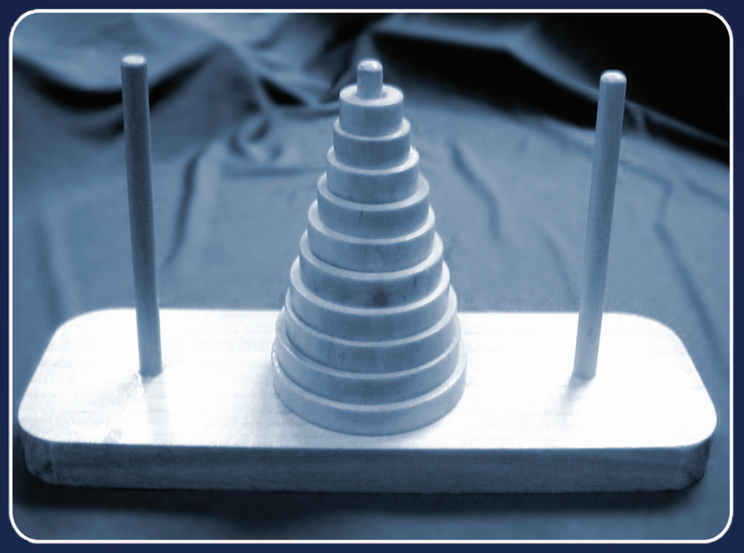
Many researchers have found a link between aggressive behavior and executive functions (EF) in adults, adolescents and school-aged samples but some others haven't. Research on this topic with preschool-aged children has lagged behind. We tried to contribute to the understanding of EF of aggressive individual by comparing a group of aggressive preschoolers to a group of socially competent preschoolers. Children were assessed at home on an EF battery and with an EF rating scale filled by their parents. The two groups did not differ in term of EF as measured by the EF battery, but aggressive children did show some executive problems on the EF rating scale, but only on the emotional control scale.

TABLE 1

Descriptives, Anovas and Ancovas

Variable	Socially competent (n=24)		Aggressive (n=25)		Anovas	Ancovas (controlling for CPRS)
	Mean	SD	Mean	SD		
EF task						
Day-night	21,04	(2,92)	20,70	(3,07)	ns	ns
Knock-tap	14,43	(0,77)	14,16	(0,98)	ns	ns
Set-shifting task	8,47	(6,55)	10,04	(7,84)	ns	ns
Brixton-like task	13,67	(6,12)	11,76	(6,13)	ns	ns
Reverse word span	4,18	(2,99)	3,43	(2,80)	ns	ns
Reverse spatial span	3,67	(1,92)	3,14	(1,88)	ns	ns
Tower task	8,46	(3,53)	6,87	(2,73)	ns	ns
Verbal fluency	28,29	(8,22)	23,91	(9,62)	ns	ns
BRIEF-P (mother and father)						
Inhibition M	**24,31**	**(3,87)**	**27,76**	**(5,98)**	**F(1, 47)=5,69***	ns
Inhibition F	25,52	(4,93)	26,13	(4,98)	ns	ns
Flexibility M	13,83	(2,87)	14,62	(3,33)	ns	ns
Flexibility F	14,04	(3,51)	13,52	(2,87)	ns	ns
Working memory M	24,04	(4,25)	24,81	(4,09)	ns	ns
Working memory F	24,85	(4,88)	22,54	(3,35)	ns	ns
Planning M	14,75	(2,67)	15,49	(3,41)	ns	ns
Planning F	15,31	(2,52)	15,22	(2,87)	ns	ns
Emotional control M	**13,93**	**(3,33)**	**16,96**	**(3,36)**	**F(1, 47)=9,98****	**F(1, 45)=3,97***
Emotional control F	**14,69**	**(3,31)**	**16,56**	**(3,06)**	**F(1, 47)=4,24***	**F(1, 45)=5,21***

* p < .05, ** p < .01



INTRODUCTION

Many researchers have found a link between aggressive behavior and executive functions (EF) in adults (Morgan & Lilienfeld, 2000), adolescents (Moffit, 1993; Roussy & Toupin, 2000) and school-aged samples (Séguin, Nagin, Asaad, & Tremblay, 2004), but some others haven't (Pennington & Ozonoff, 1996; Oosterlaan, Scheres, & Sergeant, 2005). Research on this topic with preschool-aged children has lagged behind, except for the study of Martin, Epsy and Kaufmann (2005), that didn't find any association between EF and externalized behavior.

These inconsistencies may arise for different reasons. First, the definition of aggression varies, and some researchers have focused on physically aggressive behavior, others on criminal behavior, psychopathic symptoms, diagnosis of Oppositional Defiant Disorder (ODD) or Conduct Disorder (CD), etc. Next, the studies on this topic usually don't control for Attention Deficit Hyperactivity Disorder (ADHD) symptoms when measuring aggressive behavior and as we now know that ADHD is clearly linked to an executive dysfunction (Willcutt, Doyle, Nigg, Faraone, & Pennington, 2005), the differences may be explained by the presence of ADHD individual in aggressive groups.

OBJECTIVE

We tried to contribute to the understanding of EF of aggressive individual by comparing a group of aggressive preschoolers to a group of socially competent preschoolers, while trying to avoid the methodological pitfalls mentioned above.

METHOD

SUBJECTS

The two groups of 25 children (3-4 years olds) were selected from a sample 600 children from different day care centers of Montreal, based on their profile on the SAP (Socio-affective profile, abridged form), filled by their educator.

INSTRUMENTS

Children were assessed with the following instruments.

EXECUTIVE FUNCTIONS BATTERY

This battery consists of 8 tests based on a literature review on EF measurement with preschoolers. Components of EF examined were:

1) Inhibition (Day-night test, Knock and Tap)
2) Flexibility (Set shifting task, Brixton-like task)
3) Updating (Reverse word span, Reverse spatial span)
4) Planning (Tower task)
5) Fluency (Verbal fluency task)

BRIEF-P (BEHAVIORAL RATING OF EXECUTIVE FUNCTIONS - PRESCHOOL)

The BRIEF-P is a 63-items rating scale that can be filled by the parent or a caregiver. Each item is rated on a 3-point scale (never, sometime, and often). The instrument yields 5 factors: inhibition, flexibility, working memory, planning and emotional control. In this study, the BRIEF-P was completed by both parents.

CPRS (CONNERS PARENTS RATING SCALE), SHORT FORM

The CPRS, short form is a 30-items rating scale filled by the parent. Each item is rated on a 4-point scale (never, sometime, often and very often). The instrument yields 3 factors: opposition, inattention and hyperactivity. In this study, the CPRS was completed by both parents. Only the inattention and hyperactivity score were used to control for ADHD symptoms.

PROCEDURE

Participating families were visited at home by two psychology graduate students. While an experimenter was assessing the child with the EF battery, the other helped the parents to complete the questionnaires.

RESULTS

EF Battery: Aggressive and socially competent children did not differ in term of executive functions as measured directly by the EF battery, on any of the 8 tasks (table 1-Anovas).

BRIEF-P: Aggressive children did show some executive problems compared to socially competent on the BRIEF-P, but only on the emotional control scale (father) and on the emotional control scale and inhibition scale (mother) (table 1-Anovas). Only the differences concerning the emotional control scale remained significant, for both parents, after controlling for inattention and hyperactive symptoms (table 1-Ancovas).

CONCLUSION

Those results support the view that there aren't any EF disorders in aggressive children as measured by direct testing and by behavior scale rating. The only significant difference between aggressive children and socially competent children of this sample was on the emotional control scale, which relates more to emotional auto-regulation than to central EF components (inhibition, flexibility and working memory). It is possible that aggressive behavior is more linked with what Zelazo (2005) calls "hot" aspect of executive functions (auto-regulation, inhibition in a rewarding condition, affective decision making) than with the "cool" aspects of executive functions.

Future studies should assess an even wider range of EF, use a method to ensure that ADHD symptoms are not confound with aggressive behaviors, and control for other cognitive processes (IQ, language, etc.) that might explain differences between groups.