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**Stability of Aggressive Behavior Strategies in Adolescence.
Relations Between Normative Beliefs about Aggression, Verbal Abilities
and Aggressive Behavior**

Master's thesis

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Abstract

The goal of the present study was to investigate the possible relations of aggressive behavior strategies and stability during adolescence to person's verbal abilities and normative beliefs about aggression. The sample consisted of 564 children (236 boys, 328 girls) who were in grade 7 ($n = 273$, m (*age*) = 13.27, $SD = .50$, 117 boys and 156 girls) and grade 9 ($n = 291$, m (*age*) = 15.17, $SD = .50$, 119 boys and 172 girls). All subjects filled Normative Beliefs About Aggression Scale (NOBAGS, Huesman & Guerra, 1997 with additions made by the author of the present study), Verbal Abilities Test (consisted of three tasks – Word Defining, Word Categorizing and Logical Reasoning) and three scales from Peer Estimated Conflict Behavior scale (PECOBE, Björkqvist & Österman, 1998). Scores of PECOBE for the sample were collected also 2 years earlier by Peets (2002). Results showed significantly more physical, verbal and indirect aggressive behavior in boys than girls (except for indirect aggression in grade 9) and among 7th graders compared to 9th graders. Subjects differed in stability of aggressive behavior estimates over two years, groups of stable high and changing high aggression emerged. Aggression approving normative beliefs were related to aggressive behavior positively and verbal abilities negatively. Subjects with low verbal abilities and high approval of aggression were estimated as most aggressive.

Running head: Aggressive Strategies, Verbal Abilities and Normative Beliefs

Keywords: Aggressive Behavior Strategies, Stability of Aggressive Behavior Strategies, Normative Beliefs about Aggression, Verbal Abilities

Summary in Estonian

Agressiivsete käitumisstrateegiate stabiilsus teismeeas. Agressiivse käitumise seosed normatiivsete uskumustega agressiivsuse kohta ja verbaalsete võimetega.

Käesoleva magistritöö eesmärgiks oli uurida agressiivse käitumise strateegiate ja nende stabiilsuse seoseid verbaalse võimekuse ja agressiivsust puudutavate normatiivsete uskumustega teismeeas. Valim koosnes 564 õpilasest (236 poissi, 328 tüdrukut) seitsmendast ($n = 273$, m (*vanus*) = 13.27, $SD = .50$, 117 poissi ja 156 tüdrukut) ja üheksandast klassist ($n = 291$, m (*vanus*) = 15.17, $SD = .50$, 119 poissi ja 172 tüdrukut). Osalejad täitsid 3 küsimustikku: agressiivsusega seotud normatiivsete uskumuste skaala (*Normative Beliefs About Aggression Scale* NOBAGS, Huesman & Guerra, 1997, täiendustega käesoleva uurimuse autori poolt), verbaalsete võimete testi (koosneb kolmest ülesandetüübist – sõnade defineerimine, sõnade kategoriseerimine ja loogiline järeldamine) ja kolm skaalat kaaslaste poolt hinnatud konfliktikäitumise küsimustikust (*Peer Estimated Conflict Behavior scale* PECOBE, Björkqvist & Österman, 1998). Uurimuses osalejatelt olid PECOBE skoorid kogutud ka 2 aastat varem (Peets, 2002). Selgus, et poisse hinnati oluliselt rohkem füüsiliselt, verbaalselt ja kaudselt agressiivseks kui tüdrukuid (väljaarvatud kaudne agressiivsus 9. klassis), agressiivsus oli kõrgem 7 klassi õpilaste hulgas võrreldes 9. klassi õpilastega. Ilmnesid ka erinevused agressiivsuse stabiilsuses üle kahe aasta. Uurimuses osalejate hulgas oli õpilasi, kes olid stabiilselt agressiivsed ja ka neid kes olid küll agressiivsemad kui teised, kuid nende skoorid muutusid üle kahe aasta olles nooremate hulgas tõusvad ja vanemate hulgas langevad. Agressiivsust soosivad normatiivsed uskumused seostusid agressiivse käitumisega positiivselt, verbaalsed võimed negatiivselt. Kõige agressiivsemateks nii füüsiliselt, verbaalselt kui kaudselt osutusid õpilased, kel olid madalad verbaalsed võimed ja agressiivsust soosivamad normatiivsed uskumused. Kõrge verbaalne võimekus ja agressiivset käitumist mittelubavad uskumused seostusid madala agressiivsusega..

Introduction

The various forms of antisocial behavior expressed throughout the life span have represented a serious problem since time out of mind. Countless studies have been conducted to shed some light on factors pandering or restraining antisocial behavior in general, or more narrowly, aggressive behavior. The general term *antisocial behavior* refers to a spectrum of disruptive behaviors that have in common transgressions against societal norms (Stoff, 1997). The subset of antisocial behavior under the focus in current study – *interpersonal aggression* – may be defined as any behavior directed toward another individual that is carried out with the proximate intent to cause harm (Anderson & Bushman, 2002).

During the last three decades, there has been a significant rise in numbers of studies on human aggression and aggressive behavior. But still there is a lot to learn. Researchers have investigated various aspects related to aggressive behavior, from development (Cairns, Cairns, Neckerman, Ferguson & Gariépy, 1989; see also Tremblay, 2000 for overview) and stability of aggressive behavior (Huesmann, Eron, Lefkowitz & Walder, 1984; Olweus, 1979) to cognitive processes underlying person's tendency to behave aggressively (Crick & Dodge, 1994; Dodge & Coie, 1987), and the influences of media violence to actual aggressive behavior (e.g., Huesmann, Moise & Podolski, 1997). The majority of early work in this area was done with focus on direct and observable forms of aggressive behavior and on mainly male samples. It is universally acknowledged that males tend to be more overtly aggressive than females (e.g., Maccoby & Jacklin, 1974). But there is a growing body of evidence that females may actually be more aggressive than previously believed and adolescent females are now considered an important population in the study of aggression and antisocial behavior (see Odgers & Moretti, 2002 for overview). This shift can largely be attributed to changes in conceptualization of aggression to include indirect and relational forms (Björkqvist & Niemelä, 1992). To capture the prevalence of aggressive behavior in adolescence for both boys and girls, indirect forms of aggression are included into analysis in addition to physical and verbal aggression in the present study.

Person's tendency to behave aggressively is influenced by several aspects – specifically early predisposing factors with specific learned experiences. There have been conducted numerous studies on how persons' intellectual functioning might affect the aggressive behavior. It has been found that intellectual abilities in general tend to correlate negatively with person's tendency to behave aggressively but the strength of the relationship has found to be different (e.g., Huesmann, Eron, Yarmel, 1987; Feshbach & Price, 1984). Besides person's abilities we must consider also the characteristics of their social information processing mechanisms, for example, attribution biases (Crick, Grotpeter & Bigbee, 2002; Quiggle, Garber, Panak & Dodge, 1992; Dodge & Coie, 1987), acceptability of aggressive behavior responses or beliefs about aggression (Crick & Werner, 1992; Harris, 1995; Huesmann & Guerra, 1997; McConville & Cornell, 2003; Tapper & Boulton, 2004). In the present study we look at the possible relations of aggressive behavior strategies and their stability to person's verbal abilities and normative beliefs about aggression.

Different Forms of Aggressive Behavior

Aggression is generally the behavior resulting in hurting another person. Aggressive behavior can be differentiated according to its manifestations, i.e., physical, verbal, and indirect. Much previous research on aggression has focused on direct forms of aggression e.g., physical and verbal aggression. Recently a growing body of research has included also more covert aggression, or as different researchers have called it, social (Galen & Underwood, 1997), relational (Crick & Grotpeter, 1995; Crick, Bigbee, Howes, 1996) or indirect aggression (Björkqvist, Österman & Kaukiainen, 1992; Lagerspetz, Björkqvist & Peltonen, 1988). Those forms of aggression are conceptualized as a kind of social manipulation: the aggressor manipulates others to attack the victim, or makes use of the social structure in order to harm the target person, without being personally involved in attack, thereby avoiding retaliation (Björkqvist, Österman & Kaukiainen, 1992; Lagerspetz, et. al., 1988). Several studies have shown indirect forms of aggression to be more typical to girls than to boys (Lagerspetz, et. al., 1988; Crick & Grotpeter, 1995; Crick, Casas & Mosher, 1997), but there are also some exceptions finding boys to be

more aggressive in all types (Tomada & Schneider, 1997; Peets & Kikas, in press) or gender differences being insignificant for verbal and indirect aggression (Tapper & Boulton, 2004).

Stability of Aggressive Behavior

It is known that aggressive behavior, as a pattern of social behavior, is relatively stable across the development of the child (Olweus, 1979) and over generations (Huesmann, Eron, Lefkowitz & Walder, 1984). There have also been suggestions that persons differ in their developmental trajectories of aggressive behavior. For example Moffitt (1993) proposed two possible developmental trajectories of antisocial behavior – life-course-persistent and adolescence-limited. A small group of individuals behaves antisocially at every life-stage, whereas a larger group is antisocial only during adolescence.

As we look at different types of aggression, it seems that the frequency of direct forms of aggression, especially physical aggression, tend to increase as they approach puberty and decrease as the child gets older (Cairns, Cairns, Neckerman, Ferguson & Garipey, 1989; Tremblay, 2000). Less is known about development of indirect forms of aggression. It can be hypothesized that physical aggression may be transformed into socially more acceptable aggressive behaviors but relevant longitudinal research has not been conducted yet.

Aggressive Behavior and Normative Beliefs

Many theories of aggression have emphasized the central role of cognition in maintaining the stability of aggressive behavior over time and situations (e.g., Bandura, 1986; Huesmann, 1988). Several empirical studies have demonstrated the relation between a number cognitive mechanisms, and aggressive behavior both in childhood and adolescence (Guerra & Slaby, 1990). Many of these studies have focused on the role of specific cognitive operations or information processing skills in the regulation of

aggressive behavior. For example, it has been found that aggressive children show hostile attribution bias (Crick et. al., 2002; Quiggle, et. al., 1992; Dodge & Coie, 1987).

Huesmann and his colleagues (Huesmann, 1988; Huesmann, Guerra & Zelli, 1992) have brought out the importance of organized prior knowledge in regulating aggressive behavior. He stressed the usefulness of one type of cognitive schemas - *scripts* - in analysis of aggressive behavior. Behaviors described in scripts are filtered by self-regulating beliefs – *normative beliefs* – as Huesmann refers (Huesmann, Guerra & Zelli, 1992). Normative beliefs are defined as beliefs about what is considered acceptable social behavior – what an individual should do (Huesmann, Guerra & Zelli, 1992). This kind of beliefs can be general or situation specific (Huesmann & Guerra, 1997).

Some past research has been conducted on children's normative beliefs about aggression; however, similar to most of other research in this area, these studies have also been mainly devoted to the investigation of direct forms of aggression. Not surprisingly, these studies have shown that boys are more approving of aggression than girls (Huesmann et. al., 1992; Huesmann & Guerra, 1997). One exception is Crick's, Bigbee's and Howes' (1996) study on children's gender differences in normative beliefs about aggression. Differently from Huesmann and colleagues, they defined normative beliefs as children's perceptions of how often aggressive behavior actually occurs in their peer groups (i.e., their perceptions of the norms for aggression among their peers). They found that relational aggression was the most frequently cited angry behavior for girls and was viewed as more normative by older as compared to younger girls; whereas physical aggression was the most frequently cited angry behavior for boys (Crick, Bigbee, Howes, 1996).

Aggressive Behavior and Verbal Abilities

A number of studies have revealed a relation between aggression and poor intellectual abilities (Huesmann, Eron, Yarmel, 1987; Huesmann, Eron & Dubow, 2002). It has been found that both aggressive children and adults tend to score lower in intelligence tests

than their non-aggressive peers (Moskowitz & Schwartzman, 1989; Giancola, 1994). Furthermore, both aggression and intellectual functioning are reasonably stable in a subject's lifetime and perpetuate themselves across generations and within marriage pairs (Huesmann, Eron, Yarmel, 1987). Huesmann and his colleagues (1987) hypothesized that low intelligence makes the learning of aggressive responses more likely at an early age, and this aggressive behavior makes continued intellectual development more difficult. But not all the researchers have reached to same conclusion about the relationship between intellectual functioning and aggressive behavior. There are also some findings with only a negligible relationship between intellectual abilities and aggression (e.g., Feshbach & Price, 1984), and the academic achievement, or further more motivational aspects, are hypothesized to have a more important role than intellectual abilities.

Verbal abilities play an important role in explaining and interpreting information and in reasoning. In aggression research, verbal abilities have been generally included in the tests of general intellectual abilities, but still few studies have analyzed individual's verbal functioning separately in relation to aggression and the knowledge about the relationship is far from clear. It is found that aggressive men generally tend to be verbally less able (Giancola, 1994). Some specific aspects of verbal functioning are found to be related to aggression, e.g., inefficient executive functioning in verbal tasks (Villemarette-Pittmann, Stanford & Greve, 2003) or poorer syntactic complexity in narrative language (Cole, 2001). Even relationships between specific learning disabilities and aggressive behavior have been proven (Kaukiainen, et. al., 2002). But Koda (1999), for example, has found that aggressive girls were verbally more able than boys and non-aggressive girls were, while aggressive boys were verbally less able than their non-aggressive counterparts. This might infer to different strategies of aggressive behavior among girls.

Person's verbal abilities might play a mediating role in normative beliefs control function over the person's aggressive behavior. As Crick & Dodge (1994) argued in introducing their reformulated social information-processing model, persons come to a social situation with a set of biologically limited capabilities and a database of memories of past experiences. Their behavioral response is a function of processing cues, received from situation. These processes are claimed to be guided by database information stored in

memory (e.g., social schemata, scripts) (Crick & Dodge, 1994), and influenced by persons overall cognitive development. One might expect persons higher in verbal abilities or specifically in level of thinking (availability of scientific concepts for decision-making and logical inference, Toomela, 2003) to be more efficient in inferential processes and having more choices available than those low in verbal abilities.

Goals of the Present Research

The purpose of the present study is to explore the prevalence and stability of three different aggressive behavior strategies – physical, verbal, and indirect aggression in males and females during adolescence. Aggressive strategies were assessed using the peer rating technique, which allows to gather information about the distribution of respective quality within an entire group not only about extremes. Peers are considered the best information source as they form the so-called in-group for a rated person and they may be more aware about the incidence of aggressive behavior and less biased than self-ratings (Björkqvist, Österman & Kaukiainen, 1992; Crick & Grotpeter, 1995; Peets & Kikas, in press). Since normative beliefs are subjective in nature, also self-ratings were included in analysis for more complete picture. We expect to get some information about different aggressive behavior strategies. Are there distinct types of direct and indirect aggression (as Crick and Grotpeter argued in 1995) or such distinction is not reasonable? Also gender differences is an important issue since the distinction made between direct and indirect aggression relies largely on results of gender differences (Crick & Grotpeter, 1995; Björkqvist et al., 1992; Lagerspetz et al., 1988). In line with the results obtained by Peets and Kikas (in press), it is expected that boys in all age groups are more aggressive in all three strategies compared to girls. Since the arguments about the stability of aggressive behavior have been various from stating the relative stability (Olweus, 1979; Huesmann et al., 1984), or rise in frequencies during adolescence (for example number of studies about bullying described in Rigby, 2002). We expect both arguments to be true in some extent, i.e. the presence of different developmental trajectories is hypothesized to emerge among subjects (Moffitt, 1993)

The second aim of this study is to explore whether there is a relationship between the type of aggressive behavior used by participant, its stability, and participant's beliefs about appropriateness of aggressive behavior as Huesmann and Guerra (1997) have found for general aggression. In the current study, we define normative beliefs in line with Huesmann et al (1992) as beliefs about what is considered acceptable social behavior, including into analysis special items to explore normative beliefs about indirect aggression. We analyze the differences in normative beliefs from the perspective of subjects' levels of aggressive behavior and the relations with the content of the normative belief – general or provocation related, and different forms of aggressive behavior (physical, verbal and indirect). It is hypothesized that highly physically aggressive participants would be most approving of aggression, whereas indirectly aggressive participants would have less approving normative beliefs as compared to physically and verbally aggressive peers. Also stability in aggression is expected to be related to more extreme normative beliefs (e.g., stable high aggression is related to extremely aggression approving normative beliefs, and stable low aggression is related to low approval of aggression).

Thirdly, we look at the possible connections between verbal abilities and types of aggressive behavior. In line with previous research, it is hypothesized that physically aggressive children are expected to be verbally less able compared to all others. Gender differences are also expected. High levels of direct (physical and verbal) aggression are expected to be related to lower levels of verbal ability or at least for boys (Koda, 1999). As for girls, they may have higher verbal abilities related to high verbal or indirect aggression (Koda, 1999).

Verbal abilities and normative beliefs combined together are also of interest. Is there a relationship between normative beliefs and verbal abilities? If they are related, can one distinguish qualitatively different groups of subjects according to their levels of verbal abilities and approval of aggression? If it can be done also differences in aggressive behavior between those groups are expected. Specifically, we expect children with low verbal abilities and high approval of aggression to be the most aggressive.

Method

Participants

The longitudinal sample consisted of 564 children (236 boys, 328 girls) who were in grade five ($n = 273$) and grade seven ($n = 291$) in the 2001/2002 school year, and in grades seven and nine two years later (henceforth referred to Cohort 1 and Cohort 2 respectively). During the first data collection in 2001/2002, the whole sample consisted of 656 students (in Cohort 1 $n = 316$, Cohort 2 $n = 340$; mean age 11.20 ($SD = .53$) and 13.24 ($SD = .64$) years respectively; 287 boys, 369 girls). Peets (procedure described in Peets & Kikas, in press) conducted the testing. The size of the sample during second session in 2003/2004 was 635 students (278 boys and 357 girls) from Cohort 1 ($n = 307$; $m(age) = 13.27$, $SD = .50$), and Cohort 2 ($n = 328$; $m(age) = 15.17$, $SD = .50$). The author of the present study conducted the testing. Complete data about aggressive behavior from two time points was achieved for 564 participants (86 % from initial sample, 82% of boys and 89% of girls). Participants were from 27 separate classes from 8 different municipal schools in a middle-class neighborhood.

Measures

Aggressive Behavior. The participants were administered three scales from the Peer Estimated Conflict Behavior Questionnaire (PECOBE); (Björkqvist & Österman, 1998). This inventory is intended to measure behavior in conflict situations, and can be applied only in school classes or similar groups in which children communicate with each other on a daily basis (Björkqvist & Österman, 1998). Three scales applied in the current study estimated each one of the three strategies – physical, verbal, and indirect aggression. Each strategy was measured with a short question describing relevant behaviors (e.g., *physical aggression* – “Who is physically aggressive, that is, who hits, kicks, trips, shoves, or pushes others?”; *verbal aggression* – “Who is verbally aggressive, that is, who yells, insults, calls names, or teases others?”; and *indirect aggression* – “Who is indirectly aggressive, that is, who gossips, tells bad or false stories, says bad things

behind other's back, or tries to get others to dislike the person?"). The respondents were asked to estimate on all three scales how frequently each classmate acted in described way when he/she got angry with or had problems with another student in the class. Estimates were given using five-point scale (0 – never, 1 – seldom, 2 – sometimes, 3 – quite often, 4 – very often) by checking the appropriate choice behind each classmate's name (the list with the names of all classmates was inserted in questionnaire). As the conflicts are most frequent between opponents of the same sex, according to authors of PECOBE it is perfectly possible to rely on same-sex ratings only (Björkqvist & Österman, 1998). Two sets of scores - self-ratings and same-sex peer-ratings - were included into analysis in the present study.

Normative Beliefs about Aggression. Participants' normative beliefs about aggression were estimated with revised and extended version of Normative Beliefs about Aggression Scale (NOBAGS, Huesmann & Guerra, 1997). The NOBAGS provides information about children's beliefs about acceptability of aggressive behavior. Items vary on four dimensions: severity of provocation, severity of response, gender of provocateur, and gender of responder. Originally it consisted of six subscales (Huesmann & Guerra, 1997) – *General Approval of Aggression, Approval of Retaliation, Approval of Retaliation/Weak Provocation, Approval of Retaliation/Strong Provocation, Approval of Retaliation Against Males and Approval of Retaliation Against Females*. The strong-weak provocation manipulation was accomplished by substituting "if X hits" for "if X says something bad to", severity of response manipulation was accomplished by changing "It's OK for Y to hit X" to "It's OK for Y to scream at X". Response versions described in scale are basically physical and verbal aggressive behavior strategies. To capture the role of indirect aggression the third group of responses – indirect retaliation - was included by adding response versions "It's OK for Y to gossip and say bad things about X" and four general beliefs about indirect aggression. Consequently the scale applied in the current study consisted of total 28 items, 12 items describing possible responses (physical, verbal or indirect) to weak provocation, 4 items on strong provocation and physical response, and 12 items about general acceptability of physical, verbal or indirect aggression (see Appendix 1). Subscales included in analysis besides Total Approval of Aggression score were: General Approval of Aggression, Approval of

Retaliation, and Approval of Physical Aggression, Verbal Aggression, Indirect Aggression.

Verbal Abilities. Participants' verbal abilities were assessed using three tasks: Word Defining, Word Categorizing and Logical Reasoning, each task consisted of six items, total 18 items. The Word Defining task is a subtest of several intelligence tests, including WISC-III and WPPSI-R. The first two tasks reflect participant's structure of word meaning, person's ability to operate with hierarchically related everyday and scientific concepts (Toomela, 2003). The example of Word Defining task would be: "*Answer the following question: What is a hospital?*" The instruction to Word Categorizing task was: "*Please answer the following questions. Name only one, the most important similarity.*" and the example of the question: "*By what are the cat and dog similar?*" In the first two tasks scoring rule was that 1 point was scored only if participant had used general, scientific concepts or categories e.g., the relationship between words was defined hierarchically or a word was related to a hierarchically higher level concept (for example, *hospital* is defined as a medical institution, or *knife* and *bread* are similar because they are physical objects). If participant used everyday concepts (e.g., descriptions of sensory attributes, everyday situations, sharing of parts or function.) as a definition or categorizing aspect, 0 points was scored (see for more thorough description in Toomela, 2003). Examples of everyday concepts would be – *school* is where children go for learning, or *cat* and *dog* are similar because they have four legs.

The Logical Reasoning task consisted of syllogisms. The instruction was: "*Assume that the first two arguments are true. In this case the last argument is 1-true, 2-false, or 3-can't say*", and the example: "*No student is studious. I am studious. I am a student.*" In Logical Reasoning task participant scored 1 point for giving the theoretical answer i.e. those statements explicitly relating the conclusion to the information contained in the premises of the problem (Scribner, 1997). The participants failing to do so (who gave empiric or irrelevant answers) scored 0 points. The sum of three tasks was included into analysis.

Procedure

The first data collection took place in winter-spring 2001/2002. Children filled three scales of PECOBE and some additional questionnaires not included here (see Peets & Kikas, in press). Second data collection was conducted in winter 2003/2004. Time-span between the two testings was approximately 2 years. Normative beliefs about aggression (NOBAGS) and verbal abilities were assessed during the second testing. Participants filled out the questionnaires during regular school hours. The time needed for completion of the questionnaires was approximately 35 minutes. At the beginning of the session the short introduction of study and questionnaires was presented by the author of the current study. Parents' consent for their child's participation in a research project was obtained before the first testing. Also the students were informed before each testing about the possibility of not participating. Three boys refused to participate before the administration of questionnaires during the second testing.

Results

The analyze methods used in present study were analyses of variance (ANOVA, ANOVA with repeated measures, LSD test for post hoc comparisons) for testing the differences by gender, grade, across time, and groupings, and correlational analysis (Spearman R) to assess relationships between aggression. Cluster analysis of cases (K-means clustering) was conducted to group subjects according to their stability of aggression, and their levels in verbal abilities and approval of aggression.

Estimates on Aggressive Behavior

The three scales from PECOBE used in the current study correlated strongly with each other (ranging from .61 to .85 for peer ratings and .38 to .70 for self-ratings). These high correlations might infer to the fact that there is no three qualitatively separate aggressive strategies as it was expected, but one overall aggression. Also the internal consistency of

PECOBE (three scales put together) appeared high. In first time $\alpha = .87$ (self-estimated $\alpha = .80$, peer-estimated $\alpha = .90$) and in second time $\alpha = .83$. (self-estimated $\alpha = .76$, peer-estimated $\alpha = .90$). Still both separate scores for strategies and in total scores are included in further analysis. The results of PECOBE in two different times also correlated relatively strongly. Correlation between scores of peer-estimated aggressive behavior ($r = .69$ ($p < .0001$), in subscales ranging from .52 to .74) was somewhat stronger than correlation between self-estimated aggression scores ($r = .36$ ($p < .0001$), in subscales from .20 to .34). Also correlations between self and peer ratings were computed. Self-estimates correlated moderately with peer-estimates (Spearman R ranging from .24 ($p < .0001$) for indirect aggressive behavior to .56 ($p < .0001$) for physical aggressive behavior). Descriptive statistics of scores from two different times is shown in Table 1.

Longitudinal results in peer-estimated aggressive behavior. First, the analysis of dropout cases was conducted ($N = 92$). In line with earlier longitudinal studies about aggression, it appeared that cases not attending in the second testing scored in aggressive behavior scale during first testing significantly higher ($m = 3.44$, $SD = 2.33$ compared to $m = 2.76$, $SD = 1.94$, $F(1,654) = 13.75$; $p < .0005$). Compared to the remainder, no difference in gender or grade of dropouts was found.

Total Scores of Aggressive Behavior. The 2 (gender) x 2 (cohort) x 2 x 2 (aggressive behavior score) analysis of variance was carried out with aggressive behavior score assessed repeatedly. In case of peer-estimated aggression the main effect for gender x grade x aggressive behavior score interaction was found to be significant ($F(1,560) = 8.54$, $p < .005$). with boys in Cohort 1 (grades 5 and 7) at both times and boys in Cohort 2* in Time 1 scoring significantly higher compared to all girls at both times and also Cohort 2 boys in Time 2 (grade 9). The significant effects were revealed for gender ($F(1,560) = 184.76$, $p < .0000$), grade ($F(1,560) = 7.39$, $p < .01$), grade x time ($F(1,560) = 59.20$, $p < .0000$). Peer-estimated aggression remained relatively stable for students in Cohort 1. For Cohort 2 the scores were significantly lower at Time 2 compared to Time 1, so the boys as well as girls in grade 9 scored significantly lower compared to first

* As it was described in Participants section we refer to subjects in grade 5 at Time 1 and in grade 7 at Time 2 as Cohort 1, and subjects in grade 7 at Time 1 and in grade 9 at Time 2 as Cohort 2.

testing in grade 7 and other subjects in both times (see Table 1 for relevant mean scores and standard deviations).

Table 1
Descriptive Statistics of Aggression Scale Total Scores

	Peer-Estimated Aggression			Self-Estimated Aggression		
	N	M	SD	N	M	SD
<u>Time 1</u> Cohort 1 (grade 5)	316	2.88	1.99	285	2.30	2.32
Boys	140	3.89	2.12	125	3.10	2.60
Girls	176	2.08	1.46	160	1.68	1.86
Cohort 2 (grade 7)	340	3.00	2.14	301	2.93	2.57
Boys	147	4.06	2.21	126	4.01	2.43
Girls	193	2.20	1.68	175	2.15	2.40
<u>Time 2</u> Cohort 1 (grade 7)	307	2.95	1.97	260	2.74	2.32
Boys	140	3.95	1.89	119	3.29	2.49
Girls	167	2.11	1.61	141	2.28	2.07
Cohort 2 (grade 9)	328	2.08	1.59	242	2.02	1.97
Boys	138	2.93	1.62	101	2.70	1.98
Girls	190	1.46	1.26	141	1.53	1.83

Note. N – number of subjects, M – mean aggressive behavior total scores for subjects, SD – standard deviation of aggressive behavior total scores for subjects.

No grade x gender x aggressive behavior score interaction emerged in self-estimated aggressive behavior. Significant effects were revealed only for gender ($F(1,402) = 66.49$, $p < .0000$) with boys scoring higher than girls, and for grade x aggressive behavior score ($F(1,402) = 32.13$, $p < .0000$) with younger students scoring higher and older scoring lower during second time compared to first time. Mean scores and standard deviations are presented at Table 1.

Physical, Verbal and Indirect Aggression. The descriptive statistics of three aggressive behavior strategies estimated by peer and self are presented at Table 2. In peer-estimated physical aggression boys in all grades and both times scored significantly higher than girls did ($F(1,560) = 10.75$, $p < .005$). Cohort x time interaction was revealed for peer-estimated verbal aggression ($F(1,560) = 43.62$; $p < .0000$), with students in Cohort 2 at

Time 2 scoring lowest. Effect for gender also was revealed. Boys scored in verbal aggression higher than girls and did so at both times ($F(1,654) = 131.99, p < .0000$, and $F(1,633) = 139.59, p < .0000$) As for indirect aggression boys also scored higher than girls with one exception: boys in grade 9 did not differ from girls in any grade and both times ($F(1,560) = 11.37; p < .001$)

No difference in scores of participants in grade 7 (Cohort 2 at Time 1 and Cohort 1 at Time 2) in peer estimated aggression during two times emerged (except for boys in Cohort 2 at Time 1 scoring higher in indirect aggression than boys in Cohort 1 at Time 2 ($F(3,643) = 10.89, p < .0001$)).

In self-estimated physical and verbal aggression, significant effect emerged for gender ($F(1,420) = 142.39, p < .0000$ for physical, and $F(1,421) = 55.28, p < .0000$ for verbal aggression), and grade x aggressive behavior score interaction ($F(1,420) = 13.59, p < .001$ for physical, and $F(1,421) = 22.89, p < .0000$ for verbal) with boys scoring higher and scores increasing significantly for students in Cohort 1 and decreasing in Cohort 2. In self-estimated indirect aggression significant effect emerged only for grade x time ($F(1,432) = 21.23, p < .0001$). Changes in scores between two times appeared significant with scores increasing for younger and decreasing for older participant group. Mean scores by gender and grade are presented at Table 2.

Table 2. Means and Standard Deviations of Three Aggressive Strategies Scores

	Physical aggression				Verbal aggression				Indirect aggression			
	Self		Peers		Self		Peers		Self		Peers	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Grade 5 (N = 316)	.78	.98	.91	.77	.93	1.00	1.07	.76	.62	.84	.90	.63
Grade 7 I (N = 340)	.91	1.05	.88	.80	1.16	1.07	1.15	.81	.84	.88	.97	.66
Grade 7 II (N = 307)	.94	.98	.96	.82	1.05	.99	1.10	.77	.73	.82	.89	.53
Grade 9 (N = 328)	.64	.91	.56	.61	.85	.94	.82	.65	.58	.69	.70	.52

Note: Self – self-estimated aggression scores, Peers – peer-estimated aggression scores, Grade 7 I – scores of participants in grade 7 during first testing, Grade 7 II – scores of participants in grade 7 during second testing, M – mean score, SD – standard deviation of score.

Stability of Aggressive Behavior. To analyze differences in developmental trajectories for cases the cluster analysis (K-means clustering) with peer-estimated aggression scores at two times was conducted for Cohort 1 and Cohort 2 separately. Four clusters were revealed for both cohorts that could be described as: *Low*, *Medium*, and *High* aggression in both cohorts, in Cohort 1 cluster of subjects with increasing aggressive behavior scores and in Cohort 2 cluster of subjects with decreasing aggressive behavior scores (referred to as *Changing* in both cohorts) (see Table 3 for details). Figure 1 illustrates the differences between clusters in cohorts.

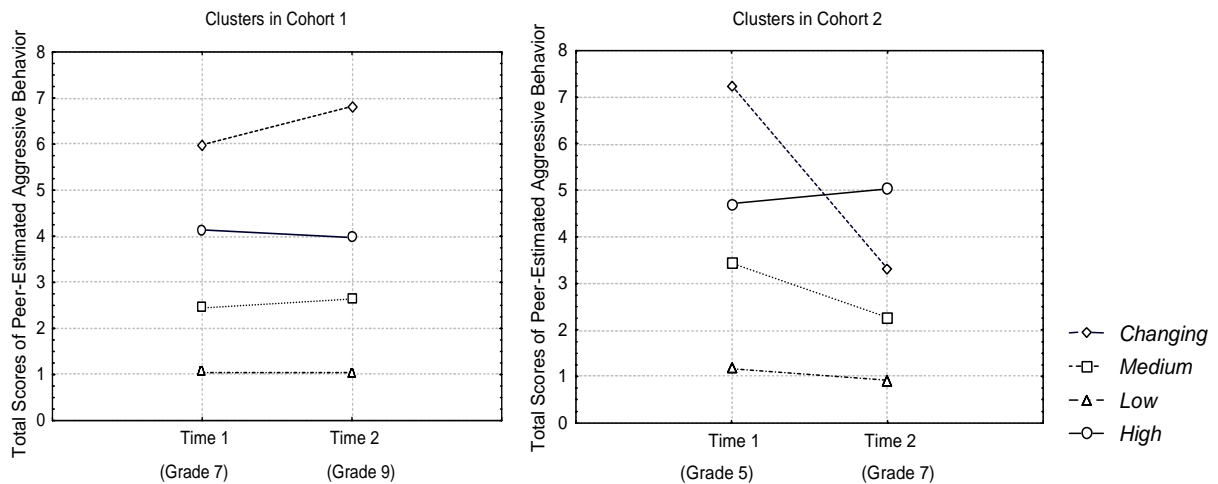


Figure 1 Aggressive Behavior Clusters in Cohort 1 and Cohort 2. Plot of Means

A cluster x time analysis of variance with aggressive behavior total scores at two times serving as repeated measure was conducted to reveal the significance of changes in aggressive behavior scores within clusters. For Cohort 1 only difference in Cluster *Changing* appeared significant ($F(3,269) = 3.83, p < .01$). For Cohort 2 change appeared significant ($F(3,287) = 72.49, p < .0001$) for all clusters except for Cluster with stable high aggression. Somewhat different tendencies appeared with self-estimated aggressive behavior. For Cohort 1 no interaction emerged, for Cohort 2 in clusters *Changing* and *Medium* scores were at Time 2 significantly lower than at Time 1 (mean scores for Cluster *Changing* 6.75 and 3.75, for Cluster *Medium* 3.32 and 2.23 respectively, $F(3,192) = 7.36, p < .0001$).

Table 3

Distribution of Subjects between Clusters. Mean Self-Rated Aggressive Behavior Scores for Each Cluster and Difference between Scores within Clusters.

	n	n(boys)	n(girls)	M (<i>aggressive behavior</i>)			
				Time 1		Time 2	
				M.....SD.....	M.....SD.....	M.....SD.....	M.....SD.....
Cohort 1 (n = 273)							
Cluster (<i>high</i>)	59	41	18	5.23	2.29	3.43	1.75
Cluster (<i>medium</i>)	92	38	54	3.16	2.14	2.24	2.11
Cluster (<i>low</i>)	92	13	79	1.44	1.61	1.25	1.43
Cluster (<i>changing</i>)	30	25	5	6.52	2.87	3.65	2.09
Cohort 2 (n = 291)							
Cluster (<i>high</i>)	32	26	6	3.39	2.71	3.33	2.41
Cluster (<i>medium</i>)	100	52	48	2.07	1.77	2.92	1.99
Cluster (<i>low</i>)	136	24	112	1.10	1.53	1.52	1.53
Cluster (<i>changing</i>)	23	17	6	4.28	2.64	5.04	2.44

Note: n – number of subjects; Cohort 1 – subjects in grade 5 at Time 1 and in grade 7 at Time 2, Cohort 2 – subjects in grade 7 at Time 1 and in grade 9 at Time2; M (*aggressive behavior*) – mean total scores of self-estimated aggressive behavior.

Normative beliefs

As we had translated and made some modifications in NOBAGS, it was necessary to analyze the properties of the scale. The reliability of the whole scale in tested sample was good (*Cronbach* $\alpha = .84$). Also the reliabilities for subscales were good (see Appendix 2). Distribution of scores was not different from a normal distribution ($\chi^2(21,462) = 25.92$, $p = .21$). Maximum raw score was 75, minimum 3 ($m = 26.53$, $SD = 10.72$).

2(grade) x 2(gender) analysis of variance was conducted. Grade differences emerged. Participants in Grade 7 got higher total scores on normative beliefs about aggression scale ($F(1,460) = 4.58$, $p < .05$) than participants in Grade 9. Same result appeared with general normative beliefs about aggression ($F(1,499) = 4.26$, $p < .05$) and normative beliefs about indirect aggression ($F(1,505) = 8.44$, $p < .005$) (see Table 4 for relevant mean scores). No significant differences between grades emerged in approval of retaliative aggression, physical and verbal aggression.

Table 4 *NOBAGS Means and Standard Deviations by Grade and Gender*

Scale:	Overall (462)		Grade 7				Grade 9			
	M	SD	Boys (102)		Girls (130)		Boys (98)		Girls (132)	
			M	SD	M	SD	M	SD	M	SD
Total Approval of Aggression	.91	.39	1.08	.37	.86	.37	1.02	.41	.76	.34
General Approval of Aggression	.66	.51	.88	.55	.56	.45	.80	.51	.48	.43
Approval of Retaliation	1.17	.41	1.25	.37	1.14	.39	1.28	.40	1.05	.39
Approval of Physical Aggression	1.03	.40	1.20	.37	.94	.40	1.17	.39	.87	.34
Approval of Verbal Aggression	1.00	.49	1.11	.46	.92	.48	1.16	.53	.87	.46
Approval of Indirect Aggression	.79	.48	.95	.47	.77	.45	.83	.49	.65	.46

Note. Number of subjects in each group is presented in brackets, M – mean score of scale or subscale, SD – standard deviation of score.

Gender differences also emerged ($F(1,460) = 43.65, p < .0001$). Girls were significantly less aggression approving in total score and in all subscales (see Table 4 for mean scores). No gender x grade interaction emerged.

Verbal Abilities

Participants' verbal abilities were assessed with three tasks described above. The internal consistency of instrument was Cronbach $\alpha = .68$. Maximum score obtained in verbal abilities instrument was 17, minimum 0 ($M = 8.65, SD = 3.26$).

As expected, higher scores in verbal abilities test were obtained by girls ($m = 9.01, SD = 3.17$) compared to boys ($m = 8.21, SD = 3.33; F(1,532) = 7.97, p < .005$), and participants in grade 9 ($m = 9.59, SD = 3.20$) compared to grade 7 ($m = 7.74, SD = 3.06; F(1,532) = 46.85, p < .0001$). No significant gender x grade interaction emerged in verbal abilities.

Normative Beliefs, Verbal Abilities and Aggressive Behavior

It was hypothesized that normative beliefs about aggression and verbal abilities as well are related to incidence and form of aggressive behavior. Indeed, the total approval of aggression and all subscale scores were significantly positively correlated to all types of peer estimated and self-estimated aggression. Correlations (Spearman R) ranged from .16 to .43 ($p < .001$). Correlations appeared to be weakest (but still significant) with self-estimated as well as peer-estimated indirect aggression (ranging from .16 to .23, $p < .001$)

Correlations between normative beliefs and aggressive behavior ratings are presented at Table 5.

The direction of correlations between verbal abilities and estimates of aggression was negative ranging up to -.34. Correlations were weak but significant (see Table 5) appearing somewhat stronger for peer-estimated aggressive behavior compared to self-estimated aggressive behavior. No relation was found between verbal abilities and self-estimated indirect aggression.

Table 5.

Correlations between Approval of Aggression, Verbal Abilities and Aggressive Behavior Scores

Approval and Abilities	Physical		Verbal		Indirect		Total	
	Self	Peers	Self	Peers	Self	Peers	Self	Peers
Total Approval	.40	.40	.37	.39	.23	.23	.39	.37
General Approval	.37	.39	.31	.37	.17**	.20	.34	.35
Approval of Retaliation	.25	.27	.29	.26	.19**	.16**	.28	.25
Approval of Physical A.	.35	.43	.33	.39	.17**	.21	.33	.38
Approval of Verbal A.	.35	.32	.30	.32	.20	.19	.34	.31
Approval of Indirect A.	.31	.29	.27	.29	.20	.19	.31	.28
Verbal Abilities	-.19	-.34	-.15*	-.32	-.01	-.25	-.15*	-.33

Note: correlations printed in bold are significant at $p < .0001$, * $p < .001$, ** $p < .0005$.

For boys all subscales of NOBAGS correlated moderately with three types of aggressive behavior (correlations ranging from .13 to .30, $p < .05$), except the approval of retaliation subscale, which was significantly related only to verbal aggression estimated by both – peers and self (correlations .14 ($p < .05$), and .25 ($p < .001$) respectively), and indirect aggression estimated by peers and self (correlations .15 and .21 ($p < .05$) respectively). For girls all correlations were significant and slightly higher than for boys ranging from .13 to .37. Table 6 presents the correlations between approval of aggression and aggressive behavior scores for boys and girls separately.

Verbal abilities correlated in girls significantly negatively with physical and verbal aggression estimated by peers and also by self (correlations ranging from -.21 to -.36) and with peer-estimated indirect aggression, whereas in boys only correlations to peer-estimated aggressive behavior were significant (-.29 and -.26 for physical and verbal respectively, $p < .0001$ and -.16 ($p < .05$) for indirect aggressive behavior). Correlations between verbal abilities and aggressive behavior scores for boys and girls separately are presented at Table 6.

Table 6
Correlations (Spearman R) Between Approval of Aggression, Verbal Abilities and Aggressive Behavior Scores for Boys and Girls Separately

Approval and Abilities	Physical				Verbal				Indirect			
	Self		Peers		Self		Peers		Self		Peers	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Total Approval	.23*	.37	.23*	.34	.27	.36	.28	.32	.22*	.24**	.23	.17*
General Approval	.21*	.32	.22*	.29	.18*	.32	.26*	.29	.14*	.20**	.19**	.18*
Approval of Retaliation	.09	.28	.10	.30	.25**	.27	.14**	.27	.21*	.20**	.15*	.15*
Approval of Physical	.19*	.30	.25**	.31	.25**	.29	.30	.27	.20*	.17*	.22	.13*
Approval of Verbal A.	.17*	.36	.13*	.28	.25**	.27	.18**	.28	.20*	.21**	.13*	.19**
Approval of Indirect A.	.22*	.27	.17*	.27	.18*	.28	.19**	.25	.15*	.24**	.18**	.13*
Verbal Abilities	-.05	-.24	-.29	-.36	-.03	-.21**	-.26	-.31	-.03	.01	-.16*	-.23

Note: correlations printed in bold are significant at $p < .0001$; * $p < .05$. ** $p < .001$.

Participants’ total approval of aggression correlated with verbal abilities negatively. Correlation was relatively weak but significant ($r = -.24$, $p < .0000$). Strongest correlation emerged with general approval of aggression subscale ($r = -.25$, $p < .0000$).

Normative Beliefs, Verbal Abilities and Stability of Aggressive Behavior. Differences in normative beliefs and verbal abilities between students in clusters of *Low, Medium, High* and *Changing* aggression were analyzed. Beliefs reflecting the highest approval of aggression were expressed by subjects in clusters *High* and *Changing* in both cohorts ($F(3,200) = 9.23, p < .0001$ and $F(3,202) = 11.97, p < .0001$ for Cohort 1 and Cohort 2 respectively). Mean scores in these two clusters were significantly higher than in clusters *Low* and *Medium* but were not different from each other (see Table 7 for means and standard deviations). Subjects in Cluster *Low* expressed the least aggression approving beliefs.

In verbal abilities also significant differences emerged. In Cohort 1 the following significant difference appeared: subjects in clusters *Low* and *Medium* scored higher than subjects in clusters *High* and *Changing* ($F(3,236) = 5.35, p < .001$), differences between clusters *Low* compared to *Medium* or *High* compared to *Changing* were not statistically significant. In Cohort 2 only subjects in Cluster *Low* differentiated significantly from subjects in clusters *Medium* and *High* ($F(3,231) = 4.12, p < .01$) scoring highest in verbal abilities test (see Table 7 for mean scores). Subjects in Cluster *Changing* did not differ from their peers in verbal abilities. No gender x cluster interaction emerged for normative beliefs and verbal abilities in two cohorts.

Table 7
Mean Scores and Standard Deviations in Approval of Aggression and Verbal Abilities in Each Cluster in Cohort 1 and Cohort 2.

Clusters	Normative Beliefs				Verbal Abilities			
	Cohort 1		Cohort2		Cohort 1		Cohort2	
	M	SD	M	SD	M	SD	M	SD
<i>Low</i>	1.09	.52	1.02	.56	8.65	2.81	10.50	2.77
<i>Medium</i>	1.34	.65	1.21	.52	7.92	3.27	9.15	3.28
<i>High</i>	1.62	.61	1.81	.62	6.72	3.01	9.00	3.36
<i>Changing</i>	1.71	.83	1.56	.86	6.80	2.53	9.18	3.51

Note. Cohort 1 – subjects in grade 5 at Time 1 and in grade 7 at Time 2, Cohort 2 – subjects in grade 7 at Time 1 and in grade 9 at Time2, low – subjects scoring low at both times, medium – subjects scoring average at both times, high – subjects high in aggression at both times; changing – subjects high in aggression but not stable, increasing for younger and decreasing for older subjects.

Verbal Abilities and Normative Beliefs Combined. To analyze possible groupings among participants according to different levels of approval of aggression and verbal abilities the cluster analysis (K-means clustering) with standardized normative beliefs total scores and verbal abilities scores was conducted. Scores were standardized by grade and gender. Analysis revealed the pattern of 4 clusters: Cluster 1 – participants with low approval of aggression and low verbal abilities, Cluster 2 – low approval of aggression and high verbal abilities, Cluster 3 – high approval of aggression and high verbal abilities, and Cluster 4– high approval of aggression and low verbal abilities. Distribution of subjects into the clusters and mean scores for each cluster are presented in Table 8.

Table 8.

Distribution of Subjects into the Clusters by Grade and Gender. Mean Scores of Verbal Abilities and Normative Beliefs for Each Cluster.

Clusters	Grade 7		Grade 9		Mean scores			
	Boys	Girls	Boys	Girls	Verbal Abilities		Normative Beliefs	
					M	SD	M	SD
Cluster 1 (N = 128)	23	42	28	35	-0.64	0.59	-0.62	0.57
Cluster 2 (N = 131)	30	33	25	43	1.06	0.52	-0.75	0.62
Cluster 3 (N = 102)	21	28	21	32	0.47	0.50	0.96	0.76
Cluster 4 (N = 94)	26	24	22	22	-1.08	0.52	0.83	0.50

Note: Cluster 1– low approval of aggression and low verbal abilities. Cluster 2 – low approval of aggression and high verbal abilities. Cluster 3 – high approval of aggression and high verbal abilities. Cluster 4 – high approval of aggression and low verbal abilities.

There were significant differences between clusters in self-estimated and peer-estimated aggressive behavior in all three types ($F(3.419) = 11.57$ and $F(3.450) = 11.27$ respectively; $p < .0001$). Participants having low verbal ability scores and high approval of aggression (Cluster 4) scored highest in both self- and peer-estimated aggression. Only exception was self-rated indirect aggressive behavior in which those high in both verbal abilities and approval of aggression (Cluster 3) scored highest. Lowest scores gained participants whose verbal abilities were high and approval of aggression low (Cluster 2). Interestingly participants having both low verbal abilities and low approval of aggression (Cluster 1) did not differ from participants having both high verbal abilities and high approval of aggression (Cluster 3) in peer-estimated strategies of aggressive behavior.

Difference between those two clusters was present in self-estimated aggressive behavior with those having low verbal abilities and low approval of aggression scoring lower in all three strategies (see Table 9 for details).

Table 9

Mean Scores and Standard Deviations of estimated aggression in each cluster.

Clusters	Physical aggression				Verbal aggression				Indirect aggression			
	Self		Peers		Self		Peers		Self		Peers	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
cluster 1	.64	.80	.63	.63	.74	.78	.86	.55	.56	.72	.75	.46
cluster 2	.50	.87	.50	.60	.68	.93	.67	.61	.52	.72	.64	.49
cluster 3	1.08	1.08	.77	.79	1.14	1.08	.96	.73	.87	.85	.79	.52
cluster 4	1.03	.96	.98	.81	1.26	.88	1.22	.77	.70	.70	.89	.62
F(3,418) values	10.18		8.65		9.87		12.15		4.62*		4.07*	

Note: Cluster 1– low approval of aggression and low verbal abilities. Cluster 2 – low approval of aggression and high verbal abilities. Cluster 3 – high approval of aggression and high verbal abilities. Cluster 4 – high approval of aggression and low verbal abilities; Self – self-estimated aggression. Peers – peer-estimated aggression. M – mean scores. SD – standard deviations of scores. All F-values are $p < .0001$. * $p < .01$.

Also 2(grade) x 2(gender) x 4(cluster) x 2(estimator) x 3(type of aggressive behavior) analysis of variance was conducted with types of aggression assessed by self or others serving as dependent variables. No interactions emerged for entire sample. An interesting cluster x estimator interaction emerged (see Figure 2). It appears that subjects in Cluster 3 tend to overestimate the frequency of their own aggressive behavior ($m(\text{self}) = 2.86$ compared to $m(\text{peers}) = 2.32$, $F(3,419) = 3.86$, $p < .01$). For other groups the difference between self and peer ratings was not significant.

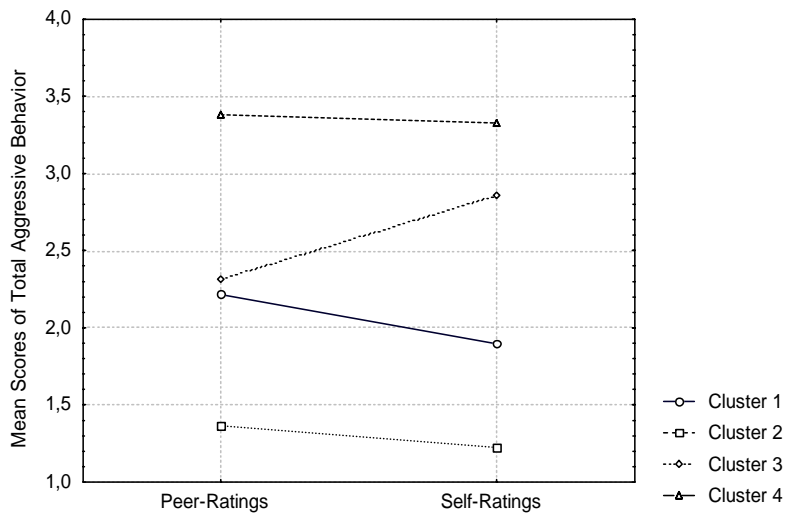


Figure 2 Self-Ratings and Peer-Ratings of Aggressive Behavior by Different Clusters

After analyzing differences in self- and peer-ratings in Cluster 3 separately by grades and gender, it appeared that girls in grade 9 contribute to this result the most. Girls in grade 9 who were high in verbal abilities and in approval of aggression overestimated their own verbal and indirect aggression ($m(\text{self}) = .97$, $m(\text{peers}) = .51$, $F(3,122) = 4.22$, $p < .01$ for verbal, and $F(3,124) = 3.85$, $p < .05$ for indirect $m(\text{self}) = .80$, $m(\text{peers}) = .53$). As for indirect aggression in fact they appeared the only group having self-ratings higher than peer-ratings.

Discussion

The purpose of the present study was first to explore the prevalence and stability of three different aggressive behavior strategies – physical, verbal, and indirect aggression during adolescence. As scores of three strategies correlated relatively strongly with each other in both self- and peer-estimations, and all three strategies showed similar trends in age and gender differences, one might suggest that there are no distinct aggressive behavior strategies (Crick & Grotpeter, 1995) but one overall aggression with somewhat different manifestations in subjects. Still in addition to overall aggression three aggressive behavior strategies were analyzed separately.

As expected self-ratings correlated moderately with peer-ratings (Peets & Kikas, in press). It has been suggested that aggressive behavior is generally not approved in society, and as people tend to give answers about themselves in socially desired manners, results showing lower aggression in self-ratings compared to peer-ratings were expected. Indeed it appeared true for group of younger students while for the older students the self-ratings appeared slightly higher compared to the peer-ratings and did so at both times (see also Peets & Kikas, in press). One might suggest that this result is influenced by more favorable attitudes toward aggressive behavior held by subjects in this cohort. But results in normative beliefs assessed in this study do not confirm this suggestion. Older students expressed less aggression approving beliefs than younger did. It might be the more wider perspective the older students apply to aggressive behavior or the inclusion of aggressive behavior outside the class context influencing the results in the current study.

Peer-estimations in all three aggressive behavior strategies were relatively stable for younger subjects (in grades 5 and 7) but lowered significantly for older subjects as they were tested in grade 9. Self-estimations appeared highest as the subjects were in grade 7. These results are consistent with earlier studies, suggesting that as children reach the puberty the frequency of antisocial and aggressive behavior increases and as they grow older, aggressive behavior rates decrease (e.g., Rigby, 2002). Moreover, clustering subjects into groups by changes in aggressive behavior rates over two years confirmed the hypothesis about differences in aggression stability between subjects. Clustering showed results consistent with Moffitt's theory about two different developmental trajectories of aggressive behavior (Moffitt, 1993). There were subjects among younger and older cohort whose peer-estimated total aggressive behavior scores were relatively high and did not change over 2 years. They constitute 16 % of whole sample (the proportion of boys to girls is almost 3 to 1). This might infer to the presence of life-course-persistent aggression in the sample of present study. A second group of subjects high on aggressive behavior also emerged, but their scores were not stable over two years. Those subjects' scores were decreasing for older cohort and increasing for younger. This pattern is coherent to adolescence-limited aggression. It would be interesting to know what happens to those subjects at grade 7 in present study as they are

in grade 9. In line with theory of adolescence-limited aggression, one might expect them to score lower than they scored in grade 7.

According to peer-estimated aggressive behavior, boys in both age groups appeared more physically and verbally aggressive than girls. This result is in line with previous findings (e.g., Crick & Grotpeter, 1995; Björkqvist, et al., 1992; Lagerspetz et al., 1988). Boys also scored higher in indirect aggression with one exception – boys in grade 9 scored significantly lower than younger boys and did not differ from girls in all grades. Still the gap in indirect aggression between boys and girls was smaller than in physical and verbal aggression. These results are on principle different from the age and gender differences obtained previously by several researchers (Galen & Underwood, 1997; Crick & Grotpeter, 1995; Björkqvist, et al., 1992; Lagerspetz et al., 1988). The results of the present study are more similar to those of Tomada and Schneider (1997), and Peets and Kikas (in press), who found boys more aggressive in both overt and relational aggression. So it can be concluded that during adolescence, boys, compared to girls, tend to use all the aggressive strategies more frequently with peak of frequency emerging approximately at age 13 and lowering from then on.

The second aim of this study was to explore whether there is a relationship between the type of aggressive behavior used by participant, its stability, and participant's beliefs about appropriateness of aggressive behavior. Since normative beliefs can be viewed as cognitive abstractions of knowledge acquired through observation, experience and direct tuition, and function as a filters in response decision process (Huesmann & Guerra, 1997), they are expected to correlate with actual behavior. Indeed, more approving beliefs about aggression appeared to be moderately related to higher levels of aggression, and it was true for all three aggression strategies in self-ratings and peer-ratings, and for both boys and girls. This result is consistent with findings by Huesmann and his colleagues (Huesmann & Guerra, 1997; Huesmann et al, 1992; Mc Conville & Cornell, 2003). Results also show that both physical and verbal aggression (rated by peers and self) are somewhat more strongly correlated to approving beliefs (.40 and .39 respectively) than indirect aggression (.23). Even normative beliefs about indirect aggression did not show stronger correlation with indirect aggression than total approval.

The direct forms of aggressive behavior seem to be more strongly normatively regulated and generally less approved than indirect aggression in school. Among some students the indirectly aggressive behaviors may be accepted or even approved, so normative beliefs about appropriateness of aggression may not be applied so consistently to those behaviors.

Also stability in aggression was expected to be related to more extreme normative beliefs since earlier normative beliefs have been found to contribute to later aggression (Huesmann & Guerra in their study with elementary school children, 1997) (e.g., stable high aggression is related to extremely aggression approving normative beliefs and stable low aggression is related to low approval of aggression). Indeed, subjects high in aggression (both stable and changing over time) expressed the highest approval of aggression in their normative beliefs whereas least approving beliefs were characteristic to subjects low in aggression.

Thirdly, we looked for possible connections between verbal abilities and types of aggressive behavior. It was hypothesized that indirectly aggressive children are verbally more able than physically or verbally aggressive children. Physically aggressive children were expected to be verbally less able compared to all others. Three aggressive behavior strategies correlated strongly and subjects high in one aggressive behavior type tended to be high also in others so significant differences could not be found. Still verbal abilities correlated negatively to all aggressive behavior strategies assessed by peers. Correlations were weakest with indirect aggressive behavior and strongest with physical aggression. Self-ratings for boys in all strategies and for girls in indirect aggression were not related to verbal abilities. So additional support to the notion that high direct aggression is related to low verbal abilities was gained. Furthermore, contrary to expectations, also indirect aggressive behavior tends to be related to lower verbal abilities though the relation is not as strong as with direct aggressive behavior. This result goes in line with the idea about one overall aggression.

Since both normative beliefs about appropriateness of aggression and verbal abilities were related (although in different ways) to aggressive behavior and correlated with each

other (the correlation was negative and significant but low) we suggested that both in combination play a role in subjects tendency to behave aggressively. Clustering of subjects revealed four qualitatively different groups of subjects according to their levels of verbal abilities and approval of aggression. Moreover the groups differed from each other in estimated aggressive behavior. We hypothesized that children who have low verbal abilities and high approval of aggression are most aggressive. Indeed it was the case, participants having low verbal abilities scores and high approval of aggression scored highest in both self- and peer-estimated aggressive behavior. Only exception was the self-estimated indirect aggression in which subjects high in both verbal abilities and approval of aggression exceeded all others. There may be several reasons for this kind of result. One is that students low in verbal abilities an high in approving normative beliefs had difficulties in identifying their behaviors aimed to harm others indirectly as aggressive behaviors while their peers did so. Additional information comes from comparison of self- and peer-ratings indicating that also subjects high in both verbal abilities and approval of aggression contribute to this result. It appeared that Older girls high in verbal abilities and highly approving of aggression tended to overestimate their own indirect (and verbal) aggressive behavior compared to peer-rated aggression. It might be so because after expressing aggression approving beliefs they were more willing to rate their own behavior as more aggressive. They may also be more critical towards their own behavior or more aware of indirectly aggressive acts they have conducted than their peers are. So also underestimation of indirect aggression in verbally able and aggression approving students might be the case.

The least aggressively behaving subjects were those high in verbal abilities and less approving of aggression. The difference between students high in both verbal abilities and approval of aggression and students low in both was somewhat more complex. In peer-ratings of aggressive behavior there was no difference. However in self-ratings those with low abilities and low approval scored lower in all three strategies. So it seems that person's verbal abilities significantly influence the self-ratings of aggressive behavior. Those low in verbal abilities tend to underestimate while those verbally more able tend to overestimate their own aggressive behavior. One might conclude that this is another proof to the claims that self-ratings in aggression studies are not reliable. But in this study

they provided important comparison to peer-ratings, and one would be short-sighted leaving self-ratings aside. Moreover, differences in self- and peer-ratings in relation to person's verbal abilities may indicate significant differences in their social information processing aspects.

Although the results of present study indicate that there is a relevant relationship between approval of aggression and verbal abilities, and self- as well as peer-estimated aggressive behavior, they are not conclusive. On the basis of results one can not conclude the causal relationships, although it seems that the relationship is complex and is bidirectional between all three components. One's behavior ratings are based on previous experience, normative beliefs are argued to be formed also by previous experience and might be mediated by verbal abilities. Since verbal abilities measured in the current study reflects the person's ability to think scientifically, and they are found to be related to formal schooling (Scribner, 1997; Snow, 1990). Aggressive behavior has found to be related to academic achievement, sometimes even more strongly than intellectual abilities (e.g., Feshbach & Price, 1984). So also academic achievement might be of importance. But the academic achievement is the variable missing from the picture in the present study. Future research is needed to clarify the relationships.

The assessment methods used in the present study may influence the results to be more conservative. Self-report scales have well known limitations, such as vulnerability to respondent bias and defensiveness in acknowledging undesirable characteristics. So the normative beliefs and estimates on aggressive behavior might be more moderate than they are in real situations. Peer-ratings of aggressive behavior are considered to be more realistic but also not totally unbiased (e.g., the role of gender stereotypes suggested by Underwood, Galen and Paquette, 2001). And also results in stability of aggression may be flawed by the fact that at both times the group of estimators was the same. Still there appeared changes in peer-estimated aggression over two years indicating that the ratings were not based solely on ready-formed impressions about peers but on recent behavior also.

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Appendix 1

NOBAGS

Järgnevalt küsime Sinu arvamust selle kohta, kas mõned käitumised on **valed** või **õiged**. Märgi ära vastus, mis Sinu arvavust kõige paremini kirjeldab. Iga küsimuse juures märki ära ainult üks vastus.

Vastuse variandid:

TÄIESTI NÕUS

PIGEM NÕUS

PIGEM MITTE

KINDLASTI MITTE

Agressiivne käitumine provokatsiooni korral**Kujutle, et üks poiss ütleb teisele poisile, Tiidule, halvasti.**

1. Kas Sinu arvates on õige, kui Tiit tema peale karjub?
2. Kas Sinu arvates on õige, kui Tiit teda lööb?
3. Kas Sinu arvates on õige, kui Tiit temast pärast teistele halvasti räägib ja kuulujutte levitab?

Kujutle, et poiss ütleb tüdrukule halvasti.

4. Kas Sinu arvates on vale, kui tüdruk tema peale karjub?
5. Kas Sinu arvates on vale, kui tüdruk teda lööb?
6. Kas Sinu arvates on vale, kui tüdruk pärast teistele poisist halvasti räägib ja kuulujutte levitab?

Kujutle, et üks tüdruk ütleb teisele tüdrukule, Marile, halvasti.

7. Kas Sinu arvates on õige, kui Mari tema peale karjub?
8. Kas Sinu arvates on õige, kui Mari teda lööb?
9. Kas Sinu arvates on õige, kui Mari pärast teistele temast halvasti räägib ja kuulujutte levitab?

Kujutle, et tüdruk ütleb poisile halvasti.

10. Kas Sinu arvates on vale, kui poiss tüdruku peale karjub?
11. Kas Sinu arvates on vale, kui poiss tüdrukut lööb?
12. Kas Sinu arvates on vale, kui poiss pärast teistele tüdrukust halvasti räägib ja kuulujutte levitab?

Kujutle, et poiss lööb teist poissi, Tiitu.

13. Kas Sinu arvates on vale, kui Tiit lööb teda vastu?

Kujutle, et poiss lööb tüdrukut.

14. Kas Sinu arvates on õige, kui tüdruk poissi vastu lööb?

Kujutle, et tüdruk lööb teist tüdrukut, Marit.

15. Kas Sinu arvates on vale, kui Mari lööb vastu?

Kujutle, et tüdruk lööb poissi.

16. Kas Sinu arvates on vale, kui poiss lööb vastu?

Üldised uskumused agressiivse käitumise kohta

17. Üldiselt on vale teisi inimesi lüüa.

18. Kui Sa oled vihane, siis võib teistele halvasti öelda.

19. Üldiselt võib teiste peale karjuda ja neile halvasti öelda

20. Tavaliselt võib teisi tõugata või lükata, kui oled vihane

21. On vale teisi inimesi solvata

22. On vale oma viha teiste peale välja valada, öeldes neile halvasti

23. Üldiselt on vale kakelda

24. Tavaliselt võib valada oma viha teiste peale välja füüsilist jõudu kasutades.

25. Üldiselt on vale teisi inimesi taga rääkida.

26. Kui oled vihane, siis võib teise kohta tema selja taga halvasti rääkida.

27. On vale oma viha kellegi peale välja valada teisi tema vastu üles ässitades

28. Üldiselt võib kuulujutte levitada.

Appendix 2

Table

Internal Consistency (Cronbach's α) of Normative Beliefs about Aggression Scale and Subscales

Scale	Overall (N = 462)	Gender		Grade	
		Boys (n = 200)	Girls (n = 262)	7 th (n = 232)	9 th (n = 230)
Total Approval of Aggression (Items 1-28)	.84	.81	.85	.83	.86
General Approval of Aggression (Items 17-28)	.82	.80	.80	.81	.82
Approval of Retaliation (Items 1-16)	.76	.71	.79	.74	.79
Approval of Physical Aggression (Items 2, 5, 8, 11, 13-16, 17, 20, 23, 24)	.66	.54	.67	.65	.67
Approval of Verbal Aggression (Items 1, 4, 7, 10, 18, 19, 21, 22)	.69	.65	.71	.62	.76
Approval of Indirect Aggression (Items 3, 6, 9, 12, 25-28)	.65	.60	.68	.60	.70

Note. Items of NOBAGS scale are presented in Appendix 1.