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Theoretical Review

DEFINING NORMAL ON THE PLAYGROUND: WHAT WOULD TINBERGEN DO?

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ABSTRACT
Using non-human animal models, ethologists have identified behaviors of children on the playground which have distinct behavioral ethograms and which seem to serve different functions. Play fighting may be seen between individuals of different size and power, especially if they reverse roles. Dominance-submission interactions often involve acts of power assertion among individuals who show reconciliation behaviors afterwards and who stay together in a stabilized hierarchical arrangement. Aggressive behaviors usually will not show such reversals, reconciliation, or stable patterns of affiliation. The literature on bullying, which was not founded on observation, has in all likelihood conflated these different behaviors; this confusion may help explain why bullying interventions often have little or no impact on changing children's behavior.

Key words: *play, play fighting, ethogram, dominance hierarchy, bullying, aggression*

INTRODUCTION

Many years ago, at joint meetings between the International Society for Human Ethology (ISHE) and the Animal Behavior Society, we presented papers on boys' interactions on a school playground in Chicago. In those papers we utilized ethological methods to create an ethogram and describe a variety of behaviors, including dominance behaviors, in these middle school students (Cronin, 1976; Cronin, Callaghan & Weisfeld, 1977).

In preparation for constructing an ethogram, we had spent many hours observing and filming the children. Following are two paragraphs which paraphrase some of our preliminary notes:

William, age 11, has brought his football out to the playground, and the fifth-grade boys agree that they will play football today. William gives orders as a dozen boys mill around him. He assigns Michael to fullback. William is the quarterback. One boy questions his assignment. William stares at him, and the boy takes his place. The game goes on, for twenty minutes, until the bell rings. Two small boys run up, smiling, to William, to tell him how good the game was. They give William some of their chips.

Ken, age 12, is also in this class. When Ken walks onto the playground, other boys walk away from him. When he approaches a smaller boy in his class, he gives him an order. The child obeys, giving Ken some of his chips. Then the smaller boy leaves quietly. He stays a long distance from Ken for the rest of lunchtime recess, until the bell rings and all the children re-enter the school.

First, note that we have said nothing about the girls. At the time we understood little about what girls were doing, and we had few useful models for understanding the girls' social behaviors. The behavior of girls is still a subject in serious need of observational research. For a review of research on inhibition by girls when they compete against boys, see Weisfeld (1986).

Returning to William and Ken, there are obvious differences, but in what ways are they meaningful? Building on a subsequent presentation at ISHE (Weisfeld, 2010), the present paper will describe strategies for documenting behaviors that occur regularly among boys in a play setting (usually on a school playground in North American and European settings). The paper will then utilize a functional approach towards understanding these behaviors in young boys, relying heavily on the vision of Niko Tinbergen, as operationalized by Owen Aldis (a founder of ISHE and donor of ISHE's Aldis Awards) and Anthony Pellegrini, a psychologist who often utilizes observational methods. Finally, this work will be related to the large body of literature on bullying found in the fields of Psychology and Educational Psychology today. We believe that this last body of literature could benefit from a more ethological approach.

Playground Behaviors: Play Fighting

As Tinbergen wrote on page 411 of his 1963 paper to which we now pay tribute, "It has been said that, in its haste to step into the twentieth century and to become a respectable science, Psychology skipped the preliminary descriptive stage that other natural sciences had gone through, and so was soon losing touch with the natural phenomena." Inspired by the vision of Tinbergen and other ethologists, Owen Aldis, when he began his work on aggression in children, wrote that "...although child psychologists have been interested in aggression in children for a long time, we do not have today even the most rudimentary physical descriptions of what children do when they fight" (Aldis, 1975, p. 292). He then added on page 295, "If I were studying aggression, the first thing I would do is observe some real fights."

Aldis began by observing dozens of different species, including cats, bears, baboons, lions, dogs, and raccoons, before observing children. Following the lead of Eibl-Eibesfeldt, he filmed most of these behaviors, often without the awareness of the subjects, and he analyzed the films later in slow motion. In these cases he observed individuals, dyads, and groups. By close examination of his catalogs of behaviors, he was able to draw conclusions about what he called "play fighting" in a variety of species, behavior sometimes called rough-and-tumble play. Sometimes Aldis observed two animals, of unequal size, strength and experience, playing at chasing each other, pouncing, pretending to bite each other, and so on. They were alternating practicing attack and defense. In humans, this would often involve an older and a younger sibling. Aldis wrote: "Role reversal is a universal phenomenon in the play of all species

and, as such, constitutes a valuable defining criterion of play" (more than mixing the order of play, e.g., chasing, maneuvering , mouthing, then returning to chasing) (p. 128).

Aldis makes a key point here, that often the animals (or children) are mismatched in terms of size and strength. He cites an example of two baboons, one much larger than the other. The smaller one attacked the larger one 40% of the time - rather clear role reversal. Of course, this role reversal often happens in play fighting among brothers and sisters in the same family, or among children of different ages on a school playground. Aldis took still photos from his films, and produced many very interesting drawings of what he saw, which also appear in his book, Play Fighting (Aldis, 1975). The key point that Aldis made was that, across species, the two youngsters begin with different degrees of power in the relationship; nonetheless, if they reverse roles, it is play; furthermore, such play serves many important developmental functions, especially learning attacking, defensive, and general bodily control abilities. In humans, he pointed out, using his drawings again, additional clues to play are seen in smiling, laughing, and exaggerated body movements. These, of course, are play invitation displays, or play intention movements (Figure 1), also seen in simians, carnivores, and ungulates. Play fighting is also distinguished from earnest attack by attenuated biting or hitting, as when a dog gently bites its master's hand.

Figure 1. A pile-on. From Aldis' drawings of playground behaviors. Reprinted from Aldis (1975, p. 193).

Playground Behaviors: Dominance and Submission

The descriptions of role reversal are quite different from the descriptions of dominance and submission behaviors which we described in our 1979 paper, and which had been documented in several classic studies (see Blurton Jones, 1972; Omark et al., 1980; Weisfeld, Muczenski, Weisfeld & Omark, 1987). William, described in the first example, gave almost all the orders during our observations, and he sometimes pushed boys into position for playing football. The other boys did what he said, not smiling, but not looking unhappy, either. William received some resources (potato chips, or crisps) voluntarily handed over to him. By counting these behaviors over hours of filmed observation, we were able to document a linear dominance hierarchy, with William occupying the alpha position at the top. Dominant and competent individuals tend to lead and instruct subordinates (Weisfeld & Weisfeld, 1984). Each child competes to gain material and social advantages that enhance fitness (even before reproductive maturity is attained). Ranks are communicated by nonverbal dominance and submission displays resembling those of simians. This behavior constitutes another type of playground behavior, dominance behavior - seen in unsupervised, organized play, but quite different from play fighting. However, dominance hierarchies often emerge through play fighting as children learn the "toughness" or fighting prowess of one another (Blurton Jones, 1967; Pellegrini, 1995). Fighting declines in frequency as children and other primates learn to anticipate the outcomes of dominance encounters (Savin-Williams, 1976). Fights are most frequent between closely matched individuals or with newcomers. Resources are seldom contested once the hierarchy has been established. Ranks sometimes show considerable stability, rendering early dominance outcomes critical for social status at maturity (Weisfeld et al., 1987).

Playground Behaviors: Bullying

The description of Ken, above, constitutes another type of behavior. Ken was not part of a group. His approach to another child resulted in Ken's giving an order and acquiring a resource (chips). The other child then left Ken by himself, moving a long distance away. This pattern of isolation of one child is viewed as a crucial behavior by another ethological researcher, Pellegrini, who sees the effort to create distance as a key sign of truly aggressive or bullying behavior on the part of the one being left behind. Pellegrini (2003) pointed out that, after play fighting or dominance-submission interactions, if not interfered with, the children stay together, in close proximity. If an adult intervenes after what appears to the adult to be a rough or harsh interaction, the adult cannot observe this next part of the interaction, the 'resolution phase'. An adult observer needs to see this resolution before deciding what the nature of the interaction was - was it a dominance interaction, rough-and-tumble play, or true aggression (which could be bullying)? Such acts of reconciliation are common after conflict, not just in young humans but in other primate species as well (de Waal, 1996). But true (or angry) aggression, entailing an intention to harm, typically results not in reconciliation, but in avoidance of the aggressor.

In terms of frequencies of these behaviors under natural circumstances (no adults interfering), ethological observations by Pellegrini, and others (e.g., Blurton Jones, 1972) suggest that much of what happens on a playground full of boys is rough-and-

tumble play (especially among preschoolers) or structured games (more as children get older), and then 80% of remaining behaviors exhibited by boys may be dominance-submission behaviors, 10% may be playfighting, 5% may be affiliative, and 5% may be true aggression or bullying, and there may be overlaps among them. This is a highly hypothetical summary, and a template for describing it is shown in Figure 2. This is offered as a hypothetical template, in the hope that future researchers will include the behavioral categories (along with other behaviors which will need to be added, such as texting or phoning) in ethograms to be used on playgrounds. Future researchers may then be able to create figures which accurately reflect playground behavior of children at various developmental stages.

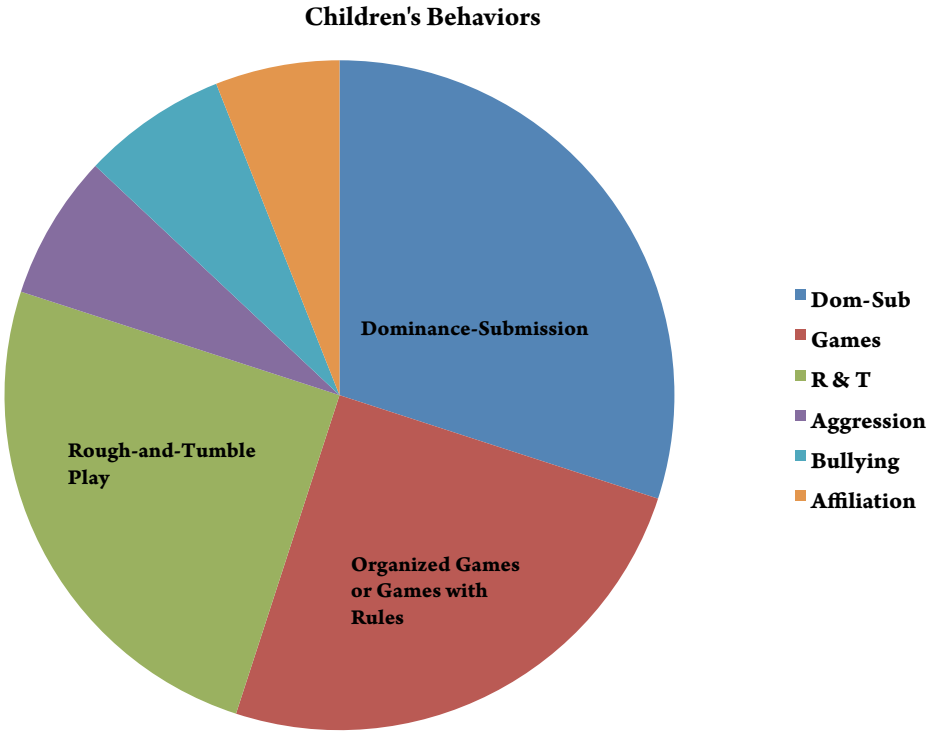

Figure 2. Template for behaviors of young boys on the playground (approximated from many studies (R & T = rough and tumble).

A number of qualifications are crucial. First, younger and older children will show different patterns, and the specific patterns for each age group are as yet unknown, because we have not done the necessary ethological work. There may well be a distinct pie chart for each age group. Second, as Pellegrini and Bartini (2001) pointed out, we are likely to see more aggression at the beginning of the school year, and more affiliation at the end of the year, because the dominance hierarchy has stabilized and there is less conflict, so time of year is an important variable. Again, as McGrew (in Blurton-Jones, 1972) observed, aggression may increase again if a new child is introduced into the group, until stability is again achieved. The context, or value system, of the school itself will also have an effect on these proportions. All of this groundwork needs to be done in

order to complete a "preliminary descriptive phase", which Tinbergen called for. Then, too, nebulous behaviors can arise. For example, violation of a social norm, such as by competing unfairly or not yielding a resource to a superior, can trigger angry aggression serving as punishment (reviewed by Weisfeld & Dillon, 2013).

Bullying: The View without an Ethological Foundation

In contrast to ethologists observing behavior, one of the prominent authors in the field of bullying research, Olweus (1999), has suggested that the behavior of children on the school playground may look like this: 80% of what children do is aggression, about 10% is violence, and another 10% is bullying, although bullying and violence overlap in his conceptualization. This is a fascinating example of what happens when a (well-intentioned, to be sure) researcher begins with a conceptual framework that is not based on description of naturally occurring, statistically normal behaviors. Play fighting and dominance-submission behaviors - which clearly are pervasive in children's lives - do not appear in this portrait of the playground. This is not surprising, as there is no indication that any direct observational work was involved in this study, which is regarded as the foundational work in research on bullying in children. Data appear to have been gathered by using survey questionnaires with children, teachers, and parents. There is nothing wrong with survey research; its quality is greatly improved, however, by building survey research on prior and continuing observation of behavior. In bullying survey instruments, lack of clarity is a significant problem stemming directly from this elimination of the descriptive phase. Olweus (1999, p. 31) includes these items in the questionnaire which he has recommended using with schoolchildren (Box 1).

The final item in the list reads, "and hurtful things like that." That item implies

Box 1. Olweus (1999) Revised Bully/Victim Questionnaire

We say a student is being bullied when another student, or a group of students

~ say mean and unpleasant things or make fun of him or her or call him or her mean and hurtful names

~ completely ignore or exclude him or her from their group of friends or leave him or her out of things on purpose

~ hit, kick, push and shove around, or threaten him or her

~ tell lies or false rumors about him or her or send mean notes and try to make other students dislike him or her

~ and hurtful things like that.

We don't call it bullying when the teasing is made in a friendly and playful way, or when two students of the same strength or power argue or fight

that the researchers believe that more behaviors are out there but they don't know what they are. This is precisely the reason why observational work should precede survey research, so we know what to look for. Otherwise, subjects may include irrelevant behaviors by extension (which Smith and Levan admitted was a problem in their 1995 paper); this invites more difficulties with reliability and uninterpretable results. Olweus

maintains that bullying behavior must occur repeatedly between children of unmatched strength or confidence levels, and he excludes teasing, but he does not make it clear how to differentiate these classes of behavior, as Aldis did so nicely when he documented play fighting as involving repeated interactions between human or non-human young of unequal size or strength, who reverse roles of attack and defense. The fact that Olweus relies so much on the issue of "unequalness" is problematic in itself, as both Aldis and Pellegrini pointed out.

There is no mention of play fighting in the work of Olweus, which makes up the background for future research on bullying; nor is there any mention of dominance-submission interactions as children form dominance hierarchies. Much of that early work, done by our colleagues Peter LaFreniere, Bill Charlesworth, Bill McGrew, Ritch Savin-Williams, and the late Don Omark and Dan Freedman, has been available for decades. None of the existing work is referred to in the classic school bullying literature, outside of the work of Pellegrini. The bullying literature often refers to verbal aggression, sometimes vaguely called 'relational aggression', but human ethologists have long recognized verbal aggression as playing a role in dominance interactions. For example, Savin-Williams (1987) observed that dominant adolescents characteristically threatened, insulted, or ridiculed subordinates. Finally, the bullying literature seems not to recognize the possibility of retaliatory, angry aggression that actually supports social norms. The nonverbal expression of anger, of course, is distinct from those of play, dominance, and submission.

A Functional Interpretation

In attempting to draw attention to the general lack of understanding of what happens on school playgrounds and what is at stake in this research, Pellegrini wrote in 2003:

"Psychologists have repeatedly confused and conflated R & T (rough-and-tumble play) with aggression, despite evidence from numerous behavioral studies of human and non-human juveniles, at least since Harlow, showing that the two have different components, antecedents, and consequences" (p. 1522).

Pellegrini pointed out at the time that schools in the U.S. and Great Britain were cutting back on recess, partly out of financial concerns but also as a way of interfering with interactions among children that might involve bullying. And this is exactly what has continued to happen: unsupervised play among children, or lightly supervised play, has largely disappeared. The implications for other social and health problems are obvious: problems with obesity, lack of exercise, self-management and role-taking skills and social skills, among others. Pellegrini and Smith (1998) commented:

"Another source of variation (in play) lies in the opportunities that children have in school for physical activity during recess. Because this is one very important practical implication of research on physical activity play, it is astonishing how little systematic investigation has been devoted to it" (p. 609).

Pellegrini has urged the use of direct observation, video analysis (following Eibl-Eibesfeldt, 1989), and video playback (asking children to view films of themselves and answer questions) for studying issues related to bullying. He has suggested that, in middle school, bullying may be a common strategy in raising one's status in the dominance hierarchy. It may relate to the ethological concept of redirected aggression. In one of Pellegrini's video playback studies, students were asked, "Can you tell who is

stronger in play fights?" The answer was, "Yes." This calls to mind early ethological research demonstrating agreement between the rank order of a group based on observational data and on adolescents' reports (Savin-Williams, 1987). There appear to be important links among play fighting, bullying, and the dominance hierarchy, and such links deserve further observational research.

In the meantime, in school bullying research, we have only had more questionnaires, given to students, teachers, and to parents, asking about bullies, victims, bully/victims, new victims, passive victims, aggressive victims, continuing victims, and escaped victims (Smith et al., 2004). Pellegrini and his associates have contributed observational studies to this body of literature, but this observational work has had little impact, at least as far as we can conclude. There seem to be few observational studies outside of Pellegrini's work. Nonetheless, much of the work on bullying is well-funded and tied to interventions. Over a three-year period, the state of Colorado spent $13 million on anti-bullying programs; recently, the state of Maryland spent $9 million on these efforts, and in 2010 the U.S. federal government invested $38.8 million in grants to 11 states for anti-bullying interventions (see Keen News announcement, 2010). It is easy to see how these programs may be expensive; hiring a trained "Olweus coach" will cost a school $4,500 for a two-day training session. The specialized manuals and survey instruments will cost additional thousands of dollars per school (see Olweus Program Materials, available online). Despite the amounts of money being spent, a major meta-analysis finds that there is no change in most variables of interest between pre-test and post-tests when these programs are evaluated (Merrell, Gueldner, Ross, & Isava, 2008).

Studying bullying is important, very important. Cyberbullying is the latest concern, and ethology may be very helpful here, in terms of explaining the absence of normal signals that children are just learning to read and interpret as part of the normal developmental process. This is precisely what Konrad Lorenz maintained about modern weaponry, that technology makes aggression easier because of the lack of face-to-face interactions, including submission displays and reconciliation. Children may do more cyberbullying if they do not have a chance to sort things out in the peer group, that is, on the playground, with minimal interference from adults who do not fully understand what they are looking at. With electronic conflict, of course, children do not experience the normal context where they can use facial and postural signals to modify their responses, and children have no way to really escape. Children need to practice face-to-face skills with one another on the playground. Children who are more aggressive in person seem to be more likely to engage in cyberbullying (Ehrenreich, Underwood, & Ackerman, 2013), which makes sense when one realizes, as Pellegrini has, that children will try to conceal aggression from adults. Private phones provide another layer of secrecy for children who do not want their actions discovered by adults.

Box 2. A need for future ethological research

Observational research is needed:
~ to document clear descriptions of dominance interactions, bullying, and play fighting
~ to produce new films and photos of all of the above - older film is rough and seldom utilized today
~ to provide clear descriptions of sequencing of behaviors and sequential analysis
~ to provide clear accounts of facial and bodily expression
~ to stimulate discussion of function: does one child stop when he gets a submissive signal from the other? Are acts of angry, retaliatory verbal or physical aggression distinguished from aggression that persists even after the subordinate has submitted?
~ to assemble clear accounts of what boys and girls are doing, and similarities and differences between them
~ to provide descriptions and real-time studies of children's uses of technology (texting, etc.) for aggression
~ to utilize video/texting playback - let children see their own films and texts and ask them questions about what they have done

Observational research is needed in this area (see Box 2), and there is funding available for it. For example, well-designed projects in this domain would certainly be considered by the committee making the Aldis awards for ISHE. At the ISHE conference in Vienna we were reminded of the advice of William Charlesworth: "Follow the duck, not the theory of the duck." This is important, and so it is important to get it right.

Basic, species-wide behaviors are timeless. Well-done earlier research on these behaviors is just as valuable as current research, and sometimes better. Literature searches should not neglect this pioneering work. Earlier studies can then serve as bases for subsequent research, rather than being neglected or even needlessly repeated. Human nature has not changed in the interim.

Many of the criticisms that have been levelled at psychiatric diagnostic categories refer to the dubious scientific basis of some defined clinical entities. Basing our understanding of behavioral pathology on normal behavioral processes is inherent in the medical model of pathology (i.e., pathophysiology). Human ethology and other evolutionary approaches are well positioned to describe the functional basis of behavior and to serve as a basis for defining and analyzing deviations from normal behavioral tendencies. In the tradition of Tinbergen, evolutionary theorists have contributed to our understanding of normal and abnormal aspects of guilt (Trivers, 1971), anger (Bernstein & Gordon, 1974; Kuester & Paul, 1992; Weisfeld & Goetz, 2013), sexual jealousy (Trivers, 1972), fear (Mineka et al., 1984), attachment (Bowlby, 1969), pride (Tracy et al., 2010), and depression (Price, 1967), among others. In this vein, evolutionary models of normal play fighting and dominance interactions may provide an essential basis for our understanding of true bullying.

References

Aldis, O. (1975). Play fighting. New York: Academic Press.

Bernstein, I. S., & Gordon, T. P. (1974). The function of aggression in primate societies. Behavioral and Brain Sciences, 4, 419-457.

Blurton Jones, N. G (1967). An ethological study of some aspec s of social behaviour of children in nursery school. In D. Morris (Ed.), Primate ethology (pp. 347-368). London: Weidenfeld & Nicolson.

Blurton Jones, N. G. (Ed.) (1972). Ethological studies of child behaviours. New York: Cambridge University Press.

Cronin, C.L., Callaghan, J.W., & Weisfeld, G.E. (1976). Playground behavior as a function of rank in the dominance hierarchy. Paper presented at the Animal Behavior Society convention, Boulder, CO.

Cronin, C.L., Callaghan, J.W., & Weisfeld, G.E. (1977). Sex differences in competitive behavior in children, Paper presented at the Animal Behavior Society convention, University Park, PA.

Bowlby, J. (1969). Attachment and loss: Vol. I: Attachment. New York: Basic Books.

de Waal, F. B. M. (1996). Conflict as negotiation. In W. C. McGrew, L. F. Marchant, & T. Nishida (Eds.), Great Ape Societies. New York: Cambridge University Press.

Ehrenreich, S.E., Underwood, M.K., & Ackerman, R.A. (2013). Adolescents' text message communications and growth in antisocial behaviour across the first year of high school. Journal of Abnormal Child Psychology, September. doi: 10.1007/s10802-013-9783-3

Eibl-Eibesfeldt, I. (1989). Human Ethology. Hawthorne, NY: Aldine de Gruyter.

Keen News Service announcement of anti-bullying grants: http://www.keennewsservice.com/2010/10/05/fed-grants-awarded-to-begin-addressing-bullying-and-safe-schools/ Last accessed on 9/28/2013.

Kuester, J., & Paul, A. (1992). Influence of mate competition and female choice on mating success in Barbary macaques. Behaviour, 120, 411-427. doi: 10.1163/156853992X00606

Merrell, K.W., Gueldner, B.A., Ross, S.W., & Isava, D.M. (2008). How effective are School Bullying Intervention Programs? A meta-analysis of intervention research. School Psychology Quarterly, 23, 26-42. doi: 10.1037/1045-3830.23.1.26

Mineka, S., Davidson, M., Cook, M., & Keir, R. (1984). Observational conditioning of snake fear in rhesus monkeys. Journal of Abnormal Psychology, 93, 355-372. doi: 10.1037/0021-843X.93.4.355

Olweus, D. (1999). Norway. In P.K. Smith, Y. Morita, J. Junger-Tas, D. Olweus, R. Catalano, & P. Slee (Eds.), The nature of school bullying (pp. 28-48). Routledge.

Olweus Program Materials available at http://www.violencepreventionworks.org/public/olweus_program_materials. Last accessed on 9/28/2013.

Omark, D. R., Strayer, F. F., & Freedman, D. G. (1980). Dominance relations: An ethological view of human conflict and social interaction. New York: Garland.

Pellegrini, A. D. (1995). A longitudinal study of boys rough and tumble play and dominance during early adolescence. Journal of Applied Developmental Psychology, 16, 77-93. doi: http://dx.doi.org/10.1016/0193-3973(95)90017-9

Pellegrini, A.D., & Bartini, M. (2001). Dominance in early adolescent boys: Affiliative and aggressive dimensions and possible functions. Merrill-Palmer Quarterly, 47, 142-163. doi: 10.1353/mpq.2001.0004

Pellegrini, A.D., & Smith, P.K. (1998). Physical activity play: consensus and debate. Child Development, 69, 609-610. doi: 10.1111/j.1467-8624.1998.tb06231.x

Price, J. S. (1967). Hypothesis: The dominance hierarchy and the evolution of mental illness. Lancet, 2, 243-246. doi: http://dx.doi.org/10.1016/S0140-6736(67)92306-9

Savin-Williams, R. C. (176). An ethological study of dominance formation and maintenance in a group of human adolescents. Child Development, 47, 972-979.

Savin-Williams, R. C. (1987). Adolescence: An ethological perspective. New York: Springer-Verlag.

Smith, P.K., & Levan, S. (1995). Perceptions and experiences of bullying in younger pupils. British Journal of Educational Psychology, 65, 489-500. doi: 10.1111/j.2044-8279.1995.tb01168.x

Smith, P.K., Talamelli, L., Cowie, H., Naylor, P., & Chauhan, P. (2004). Profiles of non-victims, escaped victims, continuing victims, and new victims of school bullying. British Journal of Educational Psychology, 74, 565-581. doi: 10.1348/0007099042376427

Tracy, J. L., Shariff, A. F., & Cheng, J. T. (2010). A naturalist's view of pride. Emotion Review, 2, 163-177. doi: 10.1177/1754073909354627

Trivers, R. L. (1971). The evolution of reciprocal altruism. Quarterly Review of Biology, 46, 35-57.

Trivers, R. L. (1972). Parental investment and sexual selection. In B. Campbell (Ed.), Sexual selection and the descent of man, 1871-1971 (pp. 136-179). Chicago: Aldine.

Weisfeld, C. C. (1986). Female behavior in mixed-sex competition: A review of the literature. Developmental Review, 6, 278-299. doi: http://dx.doi.org/10.1016/0273-2297(86)90015-8

Weisfeld, C. C. (August 2010). Traditional ethological conceptualization and methods. Paper presented at the 20th biennial congress of the International Society for Human Ethology, Madison, WI.

Weisfeld, G.E. & Dillon, L.M. (2012). Applying the dominance hierarchy model to pride and shame, and related behaviors. Journal of Evolutionary Psychology, 10, 15-41. doi: 10.1556/JEP.10.2012.1.2

Weisfeld, G. E., & Goetz, S. M. M. (2013). Applying evolutionary thinking to the study of emotion. Behavioral Sciences, 3, 388-407. doi:10.3390/bs3030388

Weisfeld, G. E., Muczenski, D.M., Weisfeld, C.C., & Omark, D.R. (1987). Stability of boys' social success among peers over an eleven-year period. Contributions to Human Development, 18, 58-80.

Weisfeld, G. E., & Weisfeld, C. C. (1984). An observational study of social evaluation: an application of the dominance hierarchy model. Journal of Genetic Psychology, 145, 89-99.