Height and Social Adjustment: Are Extremes a Cause for Concern and Action?

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ABSTRACT. *Objective.* **Growth hormone treatment of hormone-sufficient short youths is predicated on the belief that short stature is associated with social problems with peers. This study assessed peer relations and social adjustment as a function of height in a community sample.**

Methods. **A cross-sectional study was conducted at 1 public school district in Western New York of students of both genders who attended grades 6 to 12 (N = 956). Target groups included participants of short stature (height ≤−1.6 standard deviation, ie, ≤5th percentile for age- and gender-adjusted population norms; n = 68) and tall stature (≥1.6 standard deviation; ≥95th percentile; n = 58) and classmates of average height (between the 25th and 75th percentiles; n = 123) used for within-class comparisons. All remaining unclassified classmates (n = 704) also provided data. Self- and peer-rated assessment of social reputation and social acceptance was measured.**

Results. **Minimal effects of height on measures of social functioning were detected despite substantial statistical power. We detected no significant relationships between height and measures of friendship, popularity, or reputation with peers. Findings did not vary by gender of participant, by peer- or self-report, or by whether data from the entire sample were used or target groups were contrasted with comparison participants. Shorter students were perceived by peers to be younger than their age. This influence was restricted to lower grades and did not have an impact on measures of social acceptance or reputation with peers.**

Conclusions. **Extremes of stature in the general population—either short or tall—have minimal detectable impact on peer perceptions of social behavior, friendship, or acceptance. Findings are not supportive of the need to intervene a priori because of the potential risk of negative stature-related social sequelae. Furthermore, if problems with peer relationships are identified among short or tall youths, then factors other than stature should be considered as etiologically important.** *Pediatrics* 2004; 114:744–750; *short stature, growth hormone, peer relations, social adjustment.*

Short stature (SS) is conventionally defined as height that is 2 SDs (approximately the second percentile) or more below the mean for age- and gender-specific national norms,[1] but growth charts that adopt the fifth percentile (−1.6 SDs) to demarcate the lower limit of the normal range are commonly used.[2] Although SS frequently represents a normal variation of height in the general population, it can also reflect the consequences of a wide range of pathologic states, including growth hormone (GH) deficiency. Before 1985, when the sole source of GH was human cadaveric pituitaries, treatment was restricted to youths with marked SS and evidence of GH deficiency.[3] The advent of biosynthetic GH and associated unlimited supplies has made it possible not only to optimize the adult height of GH-deficient youths but also to provide treatment to those who are unusually short but test GH sufficient. At present, GH therapy has been approved for the promotion of growth in Turner syndrome,[4] chronic renal insufficiency,[5] Prader-Willi syndrome,[6] children who are born small for gestational age,[7] and, most recently, idiopathic SS (ie, short but without diagnosable pathology).[8] Regarding the category of idiopathic SS, a recent meta-analysis of controlled and uncontrolled studies suggests an average gain in adult height of ~4 to 6 cm.[9]

Negative stereotypes regarding the social adjustment of individuals with SS are plentiful.[10] SS is believed to predispose the child and adolescent to negative social experiences, including teasing, less social acceptance, and fewer friends.[11] The treatment of short children with GH is, in part, predicated on the belief that being taller will result in an improvement in short children's peer relationships. Having problematic peer relations is predictive of both current adjustment and of future adaptations in emotional, scholastic, occupational, and behavioral domains.[12–16] Peers can be a reliable and valid preferred source of data regarding social functioning.[17] Only 1 study directly examined the extent to which children with SS are liked or accepted by their peers,[18] and participants were restricted to a prepubertal (ages 6–11 years) clinic-referred group with idiopathic SS. We were unable to locate any studies using peers as informants of the social adjustment of older youths with SS within the general population. It is during

adolescence that the psychosocial stress associated with SS is intuitively believed to increase.

The current study was designed to investigate the role of stature, across a wide range, on the peer relationships of children and adolescents in the general population. We examined this issue in a community (ie, medically unselected) sample of children and adolescents. The present study addresses the following questions: 1) Is a child's height associated with peer perceptions of social reputation, friendship, or acceptance? 2) Does the association between height and social functioning vary as a function of gender or age? 3) Do youths of similar heights select each other as friends? 4) Is height predictive of social dominance or submissiveness?

METHODS

Regular classrooms (grades 6–12), in a middle-class suburban Western New York school district, with at least 1 SS student were targeted. This inclusion criterion resulted in 45 (69%) of 65 of the classrooms being eligible for participation. Students were classified as target (short or tall) or comparison (average) subjects on the basis of measured height. SS students had a measured height ≤5th percentile (ie, ≤−1.6 SDs for age- and gender-adjusted population norms).[2] Students with a measured height ≥95th percentile for norms (ie, ≥1.6 height SDs) were classified as tall stature (TS) participants. Because the focus of the study was on SS, the presence of a tall child was not required in each classroom. The mean height, expressed in SD units, for SS youths was −2.16 (SD: 0.50; range: −4.67 to −1.65 SDs) and for the TS students was 2.06 (SD: 0.33; range: 1.66–3.05 SDs). For each target subject (SS and TS), the same-gender, same-race, and average height (ie, between the 25th and 75th percentiles for height) classmate who was closest to the target student in age was chosen as a comparison subject (mean height SD: 0.01 [SD: 0.38] and 0.00 [SD: 0.38] for the comparison classmates matched with the SS and TS participants, respectively). Similar procedures have resulted in comparison groups that are highly similar in sociodemographic characteristics.[19–21] These groups of children were used to make direct comparisons of SS and TS children and comparison peers on measures of social functioning. All participating children, regardless of height, were included in a separate set of data analyses that examined the associations between height and indices of peer adaptation across the complete height distribution (see Data Analysis).

A total of 1055 students (in 45 classes) were in classrooms with 1 or more SS students. Of this potential pool, 956 (90.6%) students (and a parent/guardian) provided written informed consent to participate in the classroom assessment. The local Institutional Review Board approved the research protocol. Eight (10.5%) of 76 eligible SS and 6 (9.4%) of 64 TS target subjects refused participation. Thus, participants included 68 SS (31 boys and 37 girls) and 58 TS (33 boys and 25 girls) target subjects. Comparison subjects were available for only 65 of 68 SS cases because of a limited number of students from which to choose in 3 classes.

Procedure

Height Measurements

During the fall of the academic year in which classroom data were collected, students' heights were measured as part of routine health screenings performed by the school district. The staff who measured students' heights were different from those who administered the research protocol in the classrooms. Height was measured using portable stadiometers, and the student's height (without shoes) represented the mean of 2 measurements. In the event of a measurement discrepancy of >5 mm, a third measurement was obtained and the 2 closest measurements were averaged.

Psychosocial Assessment

Children's social functioning was assessed via 2 procedures. First, 2 sociometric questionnaires were used to measure children's relations with peers. In a nomination procedure, the subjects listed as many of their same-gender and their other-gender

participating classmates whom they regarded as their best friends. With a rating scale assessment, they indicated, on a 5-point scale (1 = "don't like" and 5 = "like a lot"), how much they liked each of their participating same-gender and other-gender classmates. The sociometric data were used to create three measures of 1) acceptance (ie, how often the student was chosen as a friend), 2) preference (ie, the mean of the liking ratings that a child received from peers), and 3) friendship (ie, the number of times a participant was chosen as a best friend by any of the classmates whom the participant had chosen as a friend). Two scores were calculated for each of these measures for each participant, one derived from the same-gender peer choices and the second from the other-gender peer choices. Each of these scores was standardized within gender and class to control for variations in the size of the nominating pool. (Additional details about sociometric measurement have been discussed by Bukowski et al.[19])

Students also completed a peer assessment instrument often referred to as the "class play." In this procedure, each child was given a list of 28 "roles" (Table 1) and was asked to pretend that he or she was the director of a class play and had to choose peers to fill these roles. As the director, he or she was responsible for choosing the same-gender peer and the other-gender peer from the class who best fit each of the roles on the list (see Rubin et al[15] for a discussion of peer assessment procedures). Using the children's choices, each student was given 2 scores for each characteristic, one indicating how often they were chosen for the characteristic by same-gender peers and the other indicating how often they were chosen by other-gender peers. These scores were standardized within gender and class. Each student also assessed himself or herself on a self-report version of the "class play" by indicating which of the 28 characteristics he or she fit. The participants could identify themselves as fitting as many roles as they wished.

Using the data from the peer and self-assessments, 16 narrowband scores and 5 broad-band scores were computed with the peer assessment score. The broad-band scores reflect the dimensions of moving toward others (ie, sociability, as indexed by "sociability leadership"), moving against others (ie, aggression: "aggressive disruptiveness"), and moving away from others (ie, withdrawal or isolation: "passive withdrawal" and "active withdrawal"). A broad-band score indicating problematic peer relations was the combination of 10 items that, as a group, indicate difficulties in functioning within the peer group. The narrow-band scores refer to subcomponents of these dimensions (ie, specific aspects of sociability, eg, "popularity") or to variables that are not

TABLE 1. Class Play Items Assessing "What a Child Is Like"

Item No.	Item
1	Is a good leader
2	Gets into fights
3	Would rather be alone than with others
4	Has good ideas for things to do
5	Loses temper easily
6	Shows off a lot
7	Interrupts when others are speaking
8	Has many friends
9	Feelings get hurt easily
10	Always nice to others
11	A person whom other kids do mean things to
12	Has trouble making friends
13	Is helpful and cooperative
14	Others don't listen to
15	Is very shy and doesn't join in
16	Gets picked on
17	Is too bossy
18	Is often left out
19	Is usually sad
20	Everyone likes to be with
21	Teases others too much
22	Picks on others
23	Has trouble with school
24	Is a class clown
25	Is not good at sports
26	Always knows the answer
27	Is very good at sports
28	Looks younger than they are

part of a bigger construct (eg, "looking young"). Four broad-band scores were computed with the self-assessment scores. They were measures of aggressive disruptiveness, sociability, withdrawal, and problematic peer relations. The broad- and narrow-band peer assessment scores were created by combining the same- and other-gender measures. A list of the items in each of the computed scale scores and an index of each scale's reliability (ie, coefficient α) are shown in Table 2.

In summary, the sociometric and rating scale assessment of relationships with peers provides an index of whether a child is liked (acceptance, preference, and friendships), whereas the class play measures what a child is like and the reputation that he or she holds within the peer group.

Data Analysis

Using these measures, 2 sets of analyses were conducted. In the first set, multiple regression was used to assess the association between height and each of the sociometric variables and the peer and self-assessment scores listed above. In these analyses, the data from the entire sample were used. In the second set, a series of repeated measures analyses of variance were conducted to compare SS with TS and average height classroom comparison peers on each of the sociometric measures and the peer and self-assessment scores.

In the multiple regression analyses, 10 variables were entered as predictors in a predetermined order: gender and school grade (step 1); height, in age- and gender-adjusted SD units (step 2); the square of the height variable, used as an index of the curvilinear effect of height (step 3); the interaction between height and gender, and the interaction between gender and the curvilinear effect of height, respectively (steps 4 and 5); the interaction between height and grade, and the interaction between grade and the curvilinear effect of height, respectively (steps 6 and 7); the 3-way interaction among grade, gender, and height (step 8); and the 3-way interaction among gender, grade, and the curvilinear effect of height (step 9). Curvilinear effects would be found when there were a threshold effect in which height affected functioning only when it was below or above a particular level. A large number of predictors were used to optimize the sensitivity of analyses. Because of the large sample size, these analyses were remarkably powerful with a high probability of detecting even small effect sizes. Statistical power was calculated to be >.9 even for effect sizes as small as 1%.[20] Given the number of analyses that we conducted, the use of the traditional significance criterion of .05 may be inappropriate as it might inflate the chance of committing a type I error (ie, labeling as significant a finding that may be attributable to chance). Nevertheless, we applied this criterion to maximize the statistical power of our design to detect whatever effects, however small, might exist within the data set. That is, our strategy was designed to optimize our ability to detect effects of stature. To protect against the identification of extraordinarily weak effects, we ignored findings that accounted for <1% of the variance.

In the second set, analyses of variance were used to compare SS with TS and average height comparison peers on each of the sociometric measures (acceptance, preference, and friendship for same- and other-gender assessments) and the 21 peer-assessment (5 broad-band and 16 narrow-band) and 4 self-assessment (all broad-band) scores. In these analyses, the comparison of the target children with the matched comparison peers was treated as a within-subjects factor because of the use of a matching procedure. Again, a very lenient probability criterion (.05) was used to establish statistical significance. A power analysis revealed that the power of each of the analyses conducted in this set to detect effects of small to moderate size would be >.8.

RESULTS

Influence of Stature Across the Full Height Range

The first set of analyses, conducted with multiple regression and using all of the participating students, examined whether height was related in any way to measures of peer relations. This analysis revealed no statistically significant associations between participants' height and the sociometric measures or the broad-band self-assessment scores. The absence of significant associations extended to the measure of problematic peer relations, assessed by both peer and self-report. In other words, student's height was unrelated to how well the individual was liked by others or self-perceptions of global reputation or social adaptation within the peer group.

Three significant effects were observed with the peer-assessment scores. One significant finding was observed with a narrow-band score from the self-assessments. The strongest findings were seen with the measure "looks young" (Fig 1). Specifically, a linear association of moderate strength (semipartial $r = -0.51$, $P < .001$) was observed between height and the "looks young" measure. This effect was qual-

TABLE 2. Class Play Narrow- and Broad-Band Scales Created With Peer (Same and Other-Gender Combined) Assessments of "What a Child Is Like"

| Type of Scale	Scale	Items	Reliability	
			Peer	Self
Narrow-band	Verbal aggression	7, 17, 21	0.86	—
	Sports ability	25 and 27 (reverse scored)	0.83	—
	School ability	23 and 26 (reverse scored)	0.81	—
	Leadership	1, 4	0.80	—
	Physical aggression	2, 22	0.87	—
	Passive withdrawal	3, 15	0.88	—
	Ineffectiveness	12, 14, 18	0.86	—
	Popularity	8, 20	0.86	—
	Sensitivity	9, 19	0.76	—
	Altruism	10, 13	0.70	—
	Victimization	11, 16	0.86	—
	Clown	6, 24	0.82	—
	Looking young	28	0.85	—
	Having a temper	5	0.73	—
	Positive dominance	16 subtracted from 1	0.79	—
	Negative dominance	16 subtracted from 22	0.77	—
Broad-band	Aggressive disruptiveness	2, 5, 7, 17, 21, 22	0.89	0.67
	Sociability leadership	1, 4, 8, 10, 13, 20	0.80	0.57
	Withdrawal (self only)	3, 9, 12, 14, 15, 18, 19	—	0.70
	Passive withdrawal	3, 9, 15	0.83	—
	Active withdrawal	12, 14, 18	0.82	
	Problematic peer relations	3, 8 (reversed scored), 11, 12, 14, 15, 16, 18, 19, 25	0.88	0.79
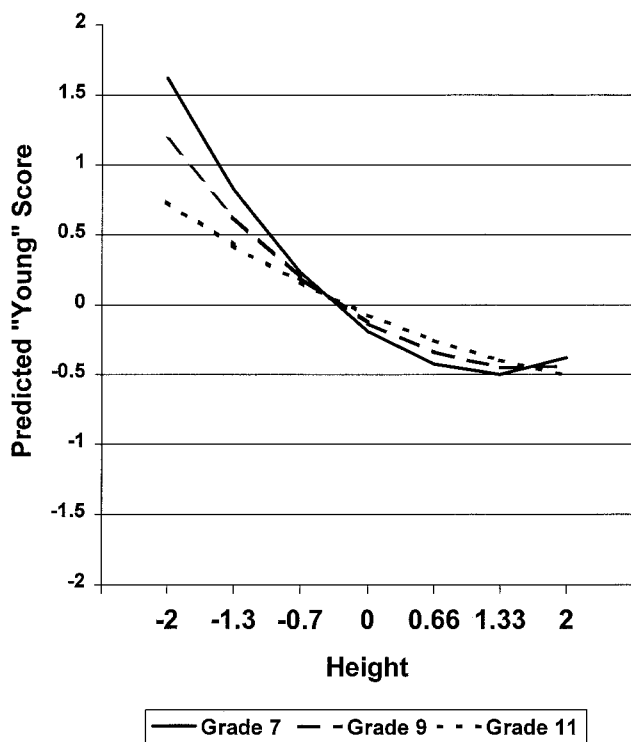
Fig 1. Association between height and class play narrow-band nomination for characteristic "looks younger than they are" (item 28) among boys and girls in grade 7, 9, or 11.

Fig 2. Association between height and class play narrow-band scales "positive dominance" and "negative dominance."

ified by a curvilinear association (semipartial $r = 0.24$, $P < .001$), indicating a threshold effect, and by an interaction between the measure of height and grade (semipartial $r = 0.13$, $P < .001$), indicating that the effect of height was different for children at different grade levels. (The semipartial r is a correlational index of the strength of an association.) The curvilinear effect was also qualified by an interaction with grade (semipartial $r = -0.16$, $P < .001$). Clarifications of these effects indicated that the association between height and the measure of looking young was stronger among the younger than the older students and that the curvilinear effect was stronger for the younger participants than the older participants. (In Fig 1, curves are shown for grades 7, 9, and 11.)

Significant findings were observed also with the positive dominance (leadership) and negative dominance (bullying) scores. Positive dominance was created by subtracting the score for the item "gets picked on" from the scores for the item "leads." Negative dominance was created by subtracting the score for the item "gets picked on" from the scores for the item "picks on others." With both the positive dominance score (leadership; semipartial $r = -0.08$, $P = .005$) and the negative dominance score (bullying; semipartial $r = -0.07$, $P < .008$) scores, a weak curvilinear (ie, threshold) effect was observed. As shown in Fig 2, a very weak but statistically significant inverted-U curve was observed for the association between height and dominance. This curve was marginally stronger for the negative dominance measure.
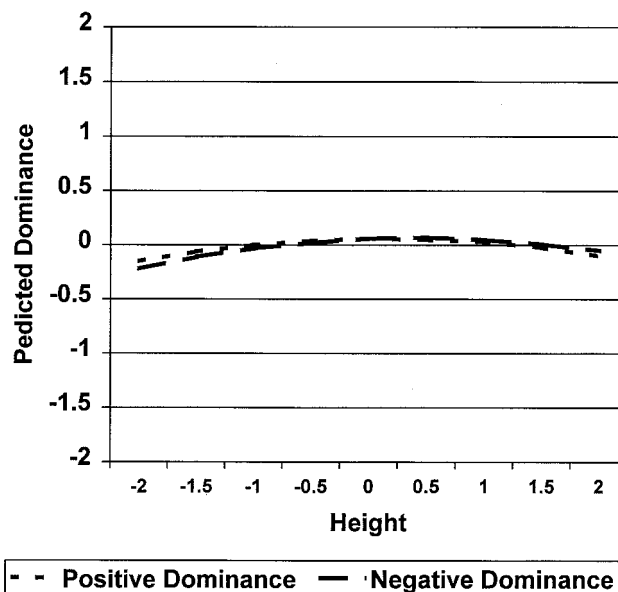
Influence of Extremes in Stature

The second set of analyses (in which SS and TS youths were compared with the comparison peers using the analysis of variance) revealed findings that were nearly identical to those from the regression analyses on the basis of the entire sample. Specifically, statistically significant findings were observed for only 3 variables despite the use of a lenient significance criterion. Two significant effects were observed with the "looks young" score. One revealed a difference between the target (SS or TS) children and the average height comparison peer (ie, a main effect for the target/comparison variable, $F[1, 122] = 48.81$, $P < .001$). The second significant finding indicated that the difference between the target child and the comparison child depended on whether the target child was short or tall (ie, there was an interaction between the target vs comparison peer variable and the short/tall variable, $F[1, 122] = 102.25$, $P < .001$). Follow-up (ie, simple effects) tests showed that the difference between the target and the comparison youths were significant when the target participant was short ($F[1, 122] = 150.79$, $P < .001$) and when the target participant was tall ($F[1, 122] = 4.69$, $P < .001$). The means show a larger difference between target and comparison when the target was short (means = 1.58 and -0.23, for target and comparison respectively) than when the target was tall (means = -0.42 and 0.10).

The third significant effect was observed with the positive dominance score. This finding revealed a significant difference between the target and comparison children (ie, a main effect for the target vs comparison variable, $F[1, 122] = 4.94$, $P < .001$). The means show nearly the same difference between the target and the comparison when the target was short (means = -0.25 and -.19, for target and comparison, respectively) as when the target was tall (means = -0.21 and 0.16). A similar pattern of findings was

observed with the negative dominance score (ie, there was a main effect for the target vs comparison variable, $F[1, 122] = 4.18$, $P < .001$). The means show nearly the same difference between the target and the comparison when the target was short (means = -0.37 and 0.18, for target and comparison, respectively) as when the target was tall (means = -0.27 and 0.05).

Influence of Marked SS

The previous analyses were repeated but restricted to those SS subjects ($n = 22$) whose height was ≤ -2.25 SDs (1st percentile) and TS ($n = 14$) whose height was ≥ 2.25 SDs (99th percentile). The use of this more stringent criterion for the classification of SS subjects is consistent with recently approved Food and Drug Administration guidelines regarding eligibility for GH treatment among individuals with idiopathic SS.[8] When this more restricted sample was used, the findings remained essentially unchanged. Moreover, there was no observable difference between the scores of the markedly short versus the more mildly short participants.

Three final analyses were conducted. First, the association between height and the "looks young" measure was explored further by assessing the extent to which the "looks young" measure was related to the sociometric measures and to the broad-band and narrow-band measures of functioning. None of the associations between the "looks young" score and the sociometric measures was significant (all $P > .2$). The "looks young" score, however, was significantly associated with 7 of the 21 of the broad- and narrow-band peer assessment scores: $r = -0.14$, 0.14, 0.11, 0.13, -0.13, -0.15, and -0.19 for the association between the "looks young" score and the scores for physical aggression, emotional sensitivity, victimization, passive withdrawal, verbal aggression, positive dominance, and negative dominance, respectively. It is important to note that the majority of these findings represent associations of little more than 1% of overlap.

Second, patterns of friendship selection were examined to assess whether a student's height was predictive of the height of the peer to whom the student was attracted. Regression analyses showed no significant associations between a participant's height and the height of the classmates to whom he or she was attracted. The comparisons of the height of the peers chosen as friends by SS and TS children also failed to reveal any significant differences.

Third, although a narrow-band scale did not exist for self-reports of victimization (class play items 11 and 16), height was not significantly associated with the combination of these items in either regression analyses that used the entire sample or comparisons between target and comparison youths. The observed r for this association in the total sample was -0.068, indicating 0.5% overlap between height and feelings of victimization.

DISCUSSION

The present study was designed to assess the accuracy of commonly held beliefs about the relationship between extremes in height—short and tall—and the social adjustment of children and adolescents within the general population. Endocrine treatment of children who have SS and are GH sufficient seems to be predicated, at least in part, on the belief that being short puts a child at risk for social problems with peers and that medical intervention will improve the individual's quality of life.[21] The student participants in the present study were unselected, producing a sample that included individuals from across the full height spectrum and a roughly equal number of boys and girls. The use of a large sample size provided adequate statistical power to detect small differences in social adjustment as a function of height. The high overall participation rate (91% of those eligible) in a school-based sample suggests that a representative sample was recruited. Furthermore, comparable participation rates within the SS (89.4%) and TS (90.6%) groups argue against a selection bias in recruitment. The study of participants who fall within an age range (grades 6–12) believed to be particularly sensitive to the presumptive social stress associated with SS and, perhaps, TS was useful as it would be in this age span when problems would be most likely to be detected. To our knowledge, this is the first study of the social influence of height to be conducted in the general population using peers as informants of the individual's status in the peer group and to make comparisons with psychometrically robust measures assessing a broad range of social adjustment (including social reputation, friendship, popularity, school functioning, and sports involvement). The predictive validity of peer nominations for mental health and social adaptation outcomes makes these data especially significant.[14]

In contradiction to the belief that height plays a role in youths' social functioning, few significant effects were observed. The instance in which social reputation was related to height was in a very narrow domain: shorter students in lower grades appeared younger than taller students. This influence of height diminished with increasing age, possibly as a consequence of secondary sex characteristics serving as additional visual cues in age perception or more discerning cognitive abilities among older youths. The finding that young individuals with SS appear younger than chronological age corroborates clinical experience[11,22,23] and provides strong evidence of the validity of the peer assessment procedure used in this study. It is important to note, however, that the social repercussions of being perceived as young were of minimal significance. Although statistically significant correlations were observed between the "looks young" measure and measures of physical and verbal aggression, positive and negative social dominance, emotional sensitivity, victimization, and passive withdrawal from peers, the strength of these observed associations was very small and typically accounted for little more than 1% of score variability. In parallel to the conclusion that SS does not seem to exert a disadvantage, the present findings indicate that there is little benefit to being tall.

The social psychological literature and popular anecdotes suggest that SS is associated with reduced positive dominance (ie, leadership characteristics).[24] A very weak association was detected in the present study between SS and lower leadership abilities. This effect was accompanied by a marginally stronger association between SS and lower negative dominance (ie, bullying). This latter finding (together with the association between looking younger and relative reduction in negative social behaviors) suggests the possibility of SS serving as a "protective factor" against the development of certain antisocial behaviors. These findings are similar to those reported by other researchers.[25]

The present observation that height influences the peer relationships of boys and girls in similar ways is inconsistent with the stereotypic notions of the enhanced importance of taller stature for boys. The substantially higher rates of referral of short boys to pediatric endocrinologists for evaluation and possible growth-promoting treatment[26,27] therefore is not easily accounted for in terms of differential social experiences of short boys and girls. Instead, the stereotype that taller stature is more important for boys than for girls may itself promote this referral bias.

It should also be noted that the prevalence of significant problems of adjustment among children and adolescents in the general population is estimated from epidemiologic studies to be ~12%.[28,29] Because of the salience of SS and the potential that it serves as a lightning rod to divert attention from other causes, clinicians must be watchful of misattributions on the part of the child, the parents, or others. Our data, qualified by limited geographic and demographic sampling, suggest that stature is not associated with problems with peers.

Finally, there was no apparent influence of height on the number of identified friendships, whether the relationship was reciprocated, or the height of the peer chosen as friend. In other words, the quality of peer relationships of children and adolescents is independent of physical stature, and the height of friends is as likely to be similar as dissimilar.

In view of the largely negative findings of the present study, it is reasonable to wonder why negative social stereotypes regarding SS are so prevalent. Schkade and Kahneman proposed that a "focusing illusion" potentially accounts for such a phenomenon. Assuming (with considerable evidence to support it[10,24]) that most people believe that SS is associated with multiple negative characteristics, it then follows that evaluations of the quality of life of an individual that focuses on this isolated trait would be overly negative. The focusing illusion occurs "when a judgment about an entire object or category is made with attention focused on a subset of that category, . . . whereby the attended subset is overweighted relative to the unattended subset."[30(p340)] For example, Schwarz et al (as cited in Schkade and Kahneman[30]) described 1 instance of the focusing illusion. In their study, college students were asked 2 questions: "How happy are you?" "How many dates did you have last month?" The correlation between responses to the questions depended on which question was asked first. When the happiness question came first, the correlation was .12. However, when the dating question preceded the one on happiness, the correlation rose to .66. Thus, focusing on 1 aspect of life to the exclusion of others results in overweighting of that factor in the experience of well-being. The focusing illusion thus serves as a potential explanation for why our perceptions of the quality of life of others—in this case youths with SS—seems to be off the mark. The existence of a focusing illusion may also serve as a cautionary note for parents and clinicians. There is the possibility that by focusing on height, this characteristic becomes overvalued relative to less salient ones. Ironically, the treatment with GH of individuals who are destined to be shorter than average and the attendant focusing of attention and energy over years may potentially amplify the negative influence of this cognitive phenomenon.

We suggest that an additional basis for exercising caution in the expanded use of GH to relieve presumed suffering of youths with SS is the risk that by making GH available to an ever-widening list of indications, most recently idiopathic SS, medicine potentially reinforces or is complicit with the social forces that maintain negative stereotypes regarding SS.[31]

In conclusion, the present study provides little support for the notion that extremes of stature—either short or tall—serve as a risk factor for poor social adjustment among youths in the general population. For this reason, arguments in support of broadening the use of GH to increase growth velocity and height should not be grounded in assumptions regarding the presumed psychosocial stresses associated with SS and attendant emotional or behavioral sequelae. Although "stereotypes" regarding SS (and TS) may influence the social experience of individuals, these seem to be minimized in the broader context of social interactions.

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"A report, titled 'The Multiplier Effect,' will be . . . available at www.nfap.net. Here are some highlights:

- More than half of the engineers with PhD's working in the US, and 45% of the nation's computer science doctorates, are foreign-born.
- Children of immigrants comprise 65% of the 2004 US Math Olympiad's top scores (13 of 20) and 46% of the US Physics Team (11 of 24).
- At this year's Intel Science Talent Search, which recognizes the nation's top math and science students, 60% of the finalists and 7 of the top 10 award winners were immigrants or their children. Last year, 3 of the top 4 awardees were foreign-born."

Wall Street Journal [editorial]. July 16, 2004

Noted by JFL, MD