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Subclasses of univalent functions. (English) [Zbl 0531.30009](#)

Complex analysis - Proc. 5th Rom.-Finn. Semin., Bucharest 1981, Part 1, Lect. Notes Math. 1013, 362-372 (1983).

[For the entire collection see [Zbl 0516.00016](#).]

This paper is concerned with the classes $S_n(\alpha) = \{f : f \text{ is holomorphic in the unit disk } U, f(0) = f'(0) - 1 = 0 \text{ and } \operatorname{Re}[D^{n+1}f(z)/D^n f(z)] > \alpha \text{ for } z \in U\}$, $0 \leq \alpha < 1$, where $D^0 f(z) = f(z)$, $D^1 f(z) = Df(z) = zf'(z)$ and $D^n f(z) = D(D^{n-1}f(z))$, $n \geq 2$. Using subordination techniques the sharp result is obtained that $S_{n+1}(\alpha) \subset S_n(\delta(\alpha))$, $0 \leq \alpha < 1$, where $\delta(\alpha) = (2\alpha - 1)/[2(1 - 2^{1-2\alpha})]$, $\alpha \neq \frac{1}{2}$, and $\delta(\alpha) = 1/(2 \ln 2)$, $\alpha = \frac{1}{2}$. From a corollary it is noted that for $0 \leq \alpha < 1$, all functions in $S_n(\alpha)$ are starlike for n a nonnegative integer and convex for n a positive integer. The author also obtains coefficients bounds that generalize a result of *H. Silverman* and *E. M. Silvia* [*Rocky Mt. J. Math.* 10, 469-474 (1980; [Zbl 0455.30011](#))].

Reviewer: D.V.V.Wend

MSC:

- [30C45](#) Special classes of univalent and multivalent functions of one complex variable (starlike, convex, bounded rotation, etc.)
- [30C50](#) Coefficient problems for univalent and multivalent functions of one complex variable
- [30C80](#) Maximum principle, Schwarz's lemma, Lindelöf principle, analogues and generalizations; subordination

Cited in **11** Reviews
Cited in **61** Documents

Keywords:

subclass of univalent functions; starlike functions; subordination