

In 1986, Bogusław Tomaszewski asked the following question: Consider  $n$  real numbers  $a_1, \dots, a_n$  such that the sum of their squares is 1. Of the  $2^n$  expressions  $|\varepsilon_1 a_1 + \dots + \varepsilon_n a_n|$  with  $\varepsilon_i = \pm 1$ , can there be more with value  $> 1$  than with value  $\leq 1$ ? Apart from being of intrinsic interest in probability, an answer to this conjecture would also have applications in quadratic programming. However, even after more than thirty years the conjecture is still unsolved.

In this thesis we settle a special case of the conjecture – we prove that the conjecture holds for vectors of the form  $(\alpha, \delta, \dots, \delta)$  of sufficiently large dimension. This generalizes earlier result which showed that the conjecture holds for vectors of the form  $(\delta, \dots, \delta)$ .