1. Reference who did it first:
   https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.23.880

2. Reading resource: A more readable text is in the The CHSH Game section of these lecture notes (about the last two pages).

3. Generalization: Generalized CHSH Inequalities are written as $I_{m_1m_2n_1n_2}$. Although it is less studied, it is possible to study $k$-party games instead of 2 parties ($I_{m_1m_2..m_kn_1n_2..n_k}$).


   However finding upper bounds for some settings is impossible due to the necessity of infinite-dimensional strategies (not realizable).

   However, for tight bounds on $I_{mm22}$ inequalities where only 2 of the observables are included in the polynomial (instead of all $m^2$), Wehner determined a formula (see Theorem 3 section 1.4 of my paper).

4. Description of EXP Problems, NP-Complete problems, co-NP-complete problems, PSPACE Problems (Determining Extremal Inequalities):

   Consider the case of general CHSH games (more observables and/or more outputs). The problem is to lower bound the Bell inequality (or the win rate) for quantum strategies with SDP. Determining this lower bound is in EXP due to the input size. When the number of outputs is 2, these CHSH games are called XOR games. Determining the quantum lower bound for XOR games is in PSPACE.

   ** See section II.C.1.c of the final link. (Or page 13)

   Suppose we are given a strategy, or a distribution of outputs for inputs, which is a point in $d$-dimensional space. The problem of determining whether this "point" lies inside the convex set of classical strategies is NP-Complete. Determining whether a set of points (an inequality) marks the boundary of the convex set (or a facet) is coNP-Complete.

   ** See Page 3 of
https://iopscience.iop.org/article/10.1088/0305-4470/37/5/021, a good introduction to generalized CHSH inequalities

**Magic Square Game**

1. Reference who did it first:

   (Doesn’t coin the term Magic Square Game)

2. Reading resources:

   (a) https://en.wikipedia.org/wiki/Quantum_pseudo-telepathy#The_magic_square_game

   (b) Section 5 of Survey of Psuedo-Telepathic Games:

   (c) $k \times k$ effects: I cannot find any works right now on the effects of games with larger squares. However, at best, I would imagine the gap decreases because optimistically the quantum win-rate remains at 1, while the classical win-rate would grow as $(n^2 - 1)/n$. However, this might be too optimistic because I am able to construct an always winning classical strategy for $4 \times 4$ (a predetermined $4 \times 4$ square).

   In contrast, any LCS (see below and Arkhipov’s work, see https://arxiv.org/abs/1209.3819) is magic if the incidence graph is constructed using only the 9 variable magic square and/or the 10 variable magic pentagram.

**Linear Constraint System**

1. This part is not written correctly, the game has unconditional classical hardness, not asymptotic, so it would be more accurate to say that the classical likelihood of winning approaches negligible for larger LCS.

2. What is NP-Hard is determining the colorability of the incidence/intersection graph for $k \geq 2$. In the paper, Arkhipov shows that any LCS is a magic/pseudo-telepathic game iff its intersection graph is non-planar. This means determining the number of colors needed for a non-planar graph (or pseudo-telepathic LCS) is NP-Hard.
Here is a final good reading resource, it is a 2014 survey on all of Nonlocality (games that test the quantum property):

https://arxiv.org/abs/1303.2849