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# Targeting in Quantum Persuasion Problem

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## Abstract

In this paper we investigate the potential for persuasion arising from the quantum indeterminacy of a decision-maker's beliefs, a feature that has been proposed as a formal expression of well-known cognitive limitations. We focus on a situation where an agent called Sender only has few opportunities to influence the decision-maker called Receiver. We do not address the full persuasion problem but restrict attention to a simpler one that we call targeting, i.e. inducing a specific belief state. The analysis is developed within the frame of a  $n$ -dimensional Hilbert space model. We find that when the prior is known, Sender can induce a targeted belief with a probability of at least  $1/n$  when using two sequential measurements. This figure climbs to  $1/2$  when both the target and the belief are known pure states. A main insight from the analysis is that a well-designed strategy of distraction can be used as a first step to confuse Receiver. We thus find that distraction rather than the provision of relevant arguments is an effective means to achieve persuasion. We provide an example from political decision-making.

## 1 Introduction

In this paper we build further on a theoretical result [7] that establishes the power of unconstrained belief manipulation or persuasion in the context of non-classical (quan-

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