

Between Circus and Science

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Circus art excites amazes and delights. Most of circus genres are based on the principles of classical physics. Dialogic discussions are known as an instrument to identify conceptual barriers (misconceptions) and facilitate their further revision. The present study integrates the three worlds: physics education, dialogic teaching and circus art; and provides a research foundation for experiential physics teaching through Dialogic Discussions about Circus Tricks (DDCT) in formal and informal setups. It aims at examining the potential of DDCT as a tool for identifying misconceptions and facilitating conceptual change regarding physics concepts. The study encircles about 40 DDCT provided in the Israeli KESHET circus. In total, about 5500 people watched the shows. From them, about 400 actively participated in the DDCT. We analyze in details four typical DDCT relating (a) circular motion, (b) moment of inertia, (c) torque and (d) heat transfer. For each DDCT we demonstrate the way it pinpoints participants' knowledge and its implementation in circus devices' analysis. Further we examine whether and how the DDCT could facilitate developing physics knowledge and / or going through a meaningful conceptual change regarding each of these concepts. Due to our results DDCT seems to be an original and promising approach to bring advanced physics ideas to the general public, in ways that are interesting, experiential and relatively easy to understand. We finish with practical recommendations for physics educators (as well as circus artists) who would like to implement DDCT in their classes (shows).