10th ANNUAL
ARPH CONFERENCE 2021
28 & 29 January 2021 | Online edition

****accepted abstract****

**Title:** Less carrot more stick: investigating deposit contract financial incentives for physical activity behavior change in a smartphone application


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## Abstract

**Background:** Deposit contracts, a form of financial incentives in which participants deposit their own money, are an inexpensive intervention with possibly beneficial effects on behavior by utilizing the power of loss aversion. However, uptake might be limited and literature suggests that merely framing an incentive as a loss is more effective than framing it as a gain. This study investigated whether (1) deposit contracts have lower uptake but higher effectiveness compared to traditional rewards, (2) loss framing leads to higher effectiveness, and (3) if these factors interact.

**Methods:** We used a 2 (incentive type; deposit vs reward) x 2 (feedback frame; gain vs loss) experimental between-subjects design with participant days step goal achieved as primary outcome. Ninety-one respondents were randomized to either deposit 10 euro or receive 10

euro as a reward via a digital bank transfer and received daily feedback for 20 days that was either loss or gain framed.

**Results:** Uptake of deposit contracts was lower than that of rewards ($\chi^2=8.07$, $p=.005$). Furthermore, a two-way ANOVA showed no main effect of incentive type ($p=.159$, $\eta p2=.048$), but gain framed feedback was more effective than loss framed feedback ($p=.014$, $\eta p2=.14$). We did not find an interaction effect ($p=.797$).

**Discussion:** The finding that deposit contracts had lower uptake but were equally effective as reward incentives is important since deposit contracts have implementation benefits. Unexpectedly, gain framed feedback was more effective than loss framed feedback. More research into this unexpected framing effect and how to increase uptake of deposit contracts is needed.