

UNRAVELING MOBILE EXERCISE INTERVENTIONS

A critical examination of the implementations and designs of persuasive strategies

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INTRODUCTION

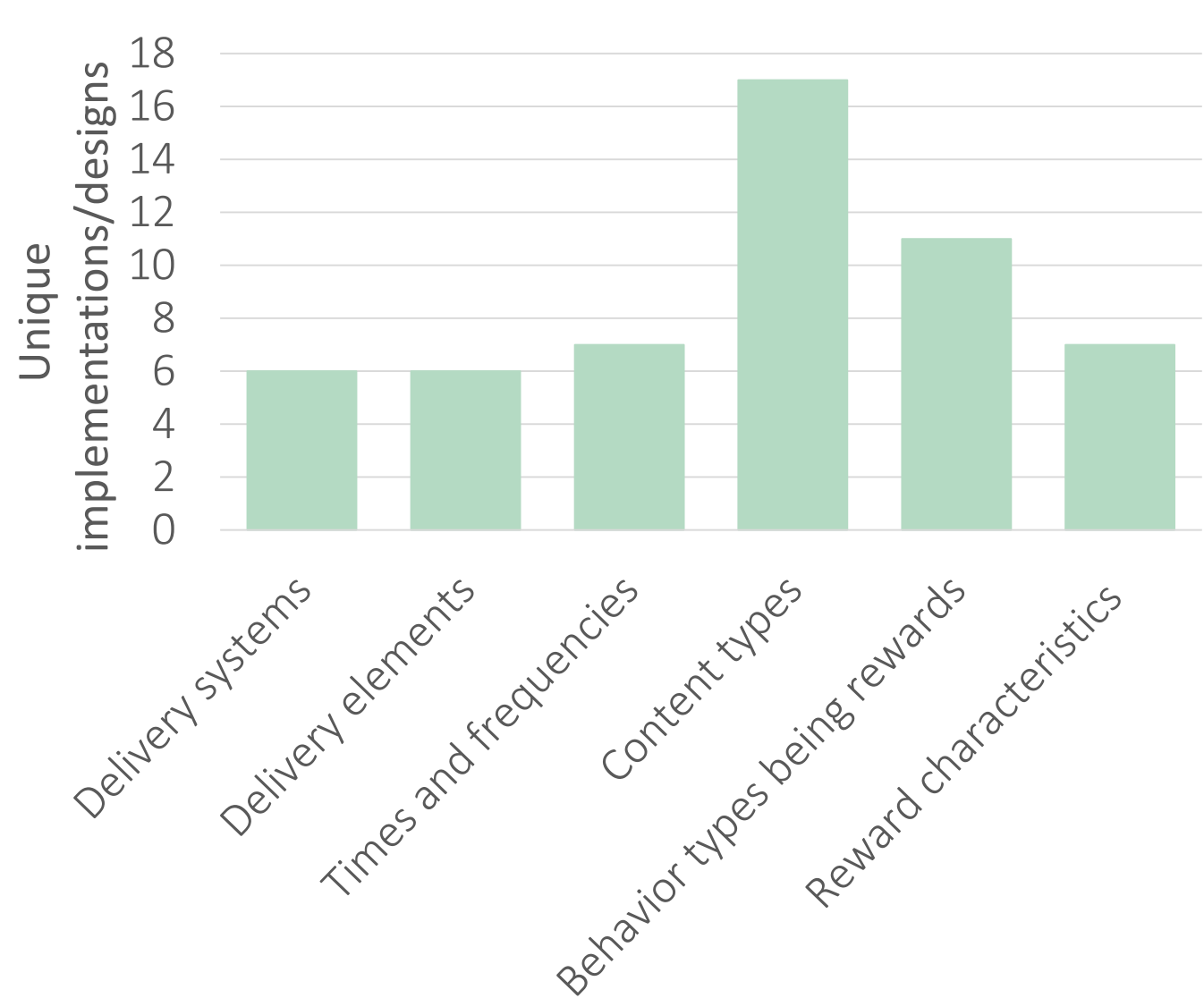
With this scoping review we aim to gain a better understanding of why some mobile physical activity (PA) interventions are more effective than others in increasing PA. To this end, we explored the different *technical implementations* and *design characteristics* of common and likely effective persuasive strategies (*goal setting, monitoring, reminders, rewards, sharing and social comparison*). Furthermore, we examine to what extent it might influence the effectiveness of the strategy to persuade the user to engage in PA.

RESULTS

29 original interventions were identified (86 intervention arms). A *great heterogeneity* regarding the design characteristics and technical implementation was found in all persuasive strategies. Moreover, we demonstrated that *some implementations are more effective than others*. Thus, *how* an persuasive strategy is designed and implemented influences the effectiveness of the intervention. Detailed results of the strategies 'rewards' and 'goal setting' are displayed below.

REWARDS

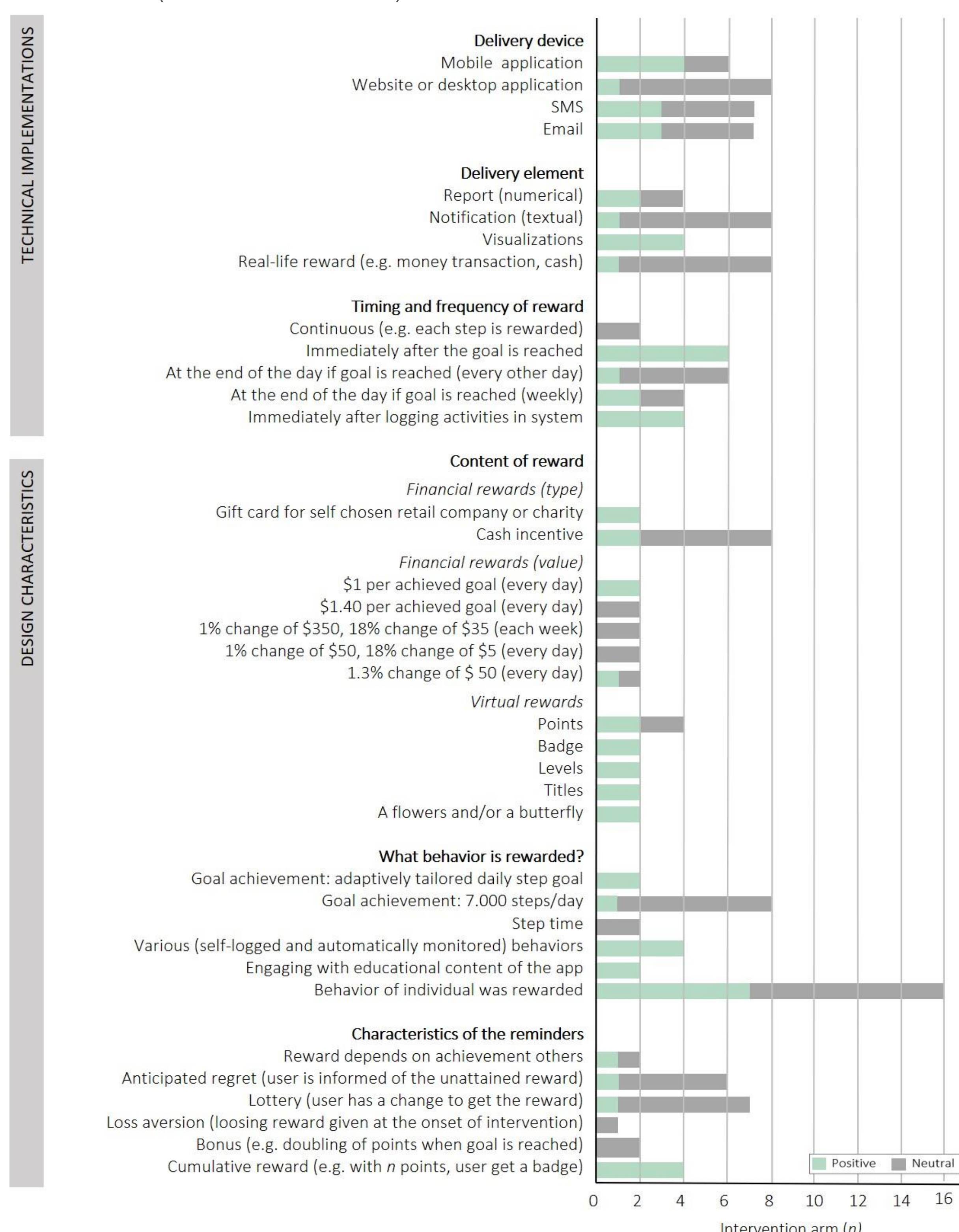
Figure 1: The identified technical implementations and design characteristics of rewards in 12 studies (30 intervention arms)



Studies comparing implementations and designs

1. Only 3 studies compared designs (none examined implementations)
2. Cumulative rewards are promising;
3. No difference for rewarding team vs. individual and loss aversion vs. lottery.

Figure 2: The effectiveness of adding rewards with different technical implementations and design characteristics to the intervention compared to receiving no rewards in 16 intervention arms (7 different studies)



METHOD

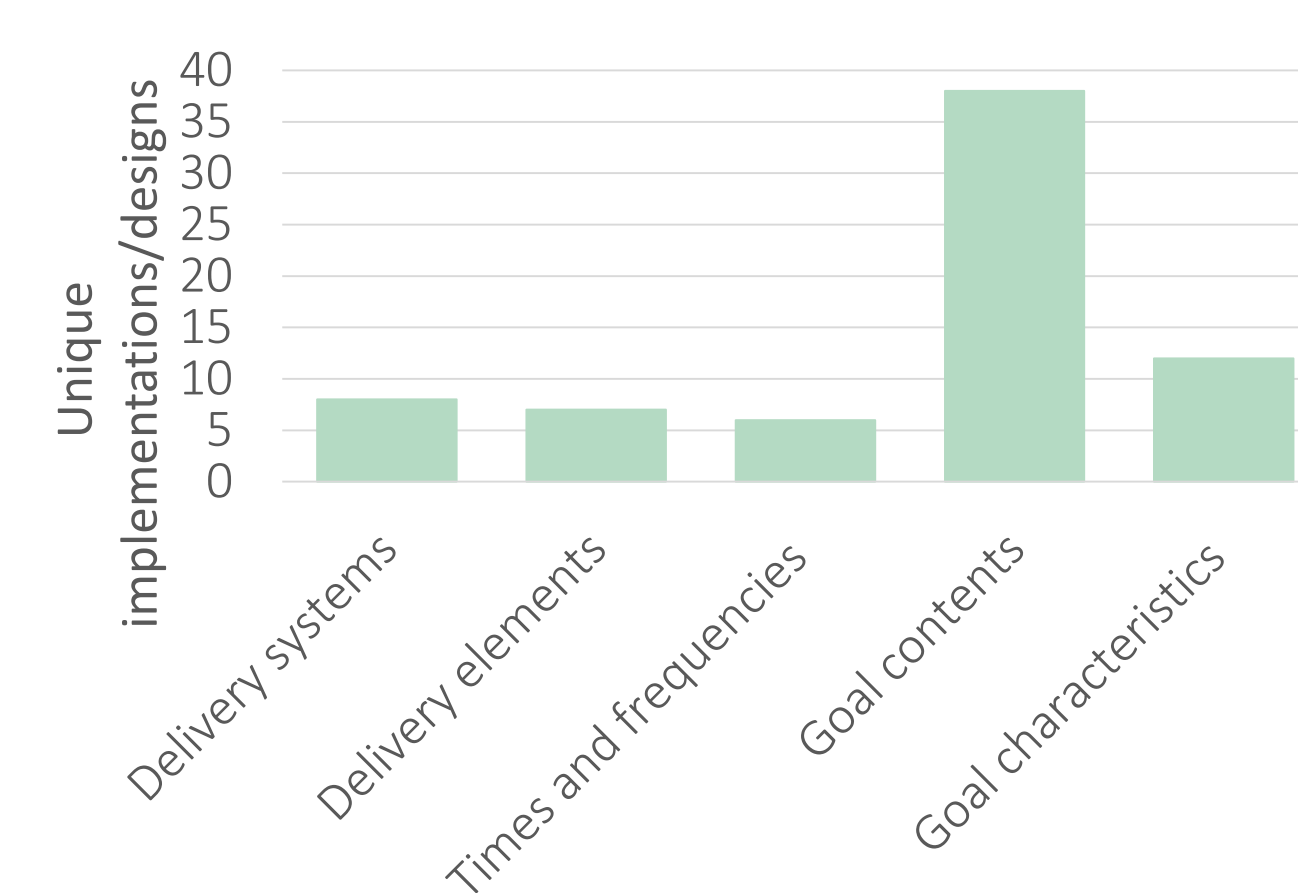
Search strategy: Snowball and grey literature searches were performed. Studies were included if they met the selection criteria.

Data extraction: The data chart was developed with multiple iterations. The final chart consisted of:

1. Study characteristics (e.g. study duration, target group)
2. Technical implementation (delivery systems and elements, workflow) and design characteristics of the persuasive strategy (e.g. content, complexity) (inspired by [1])
3. Study results (positive, neutral and negative)

GOAL SETTING

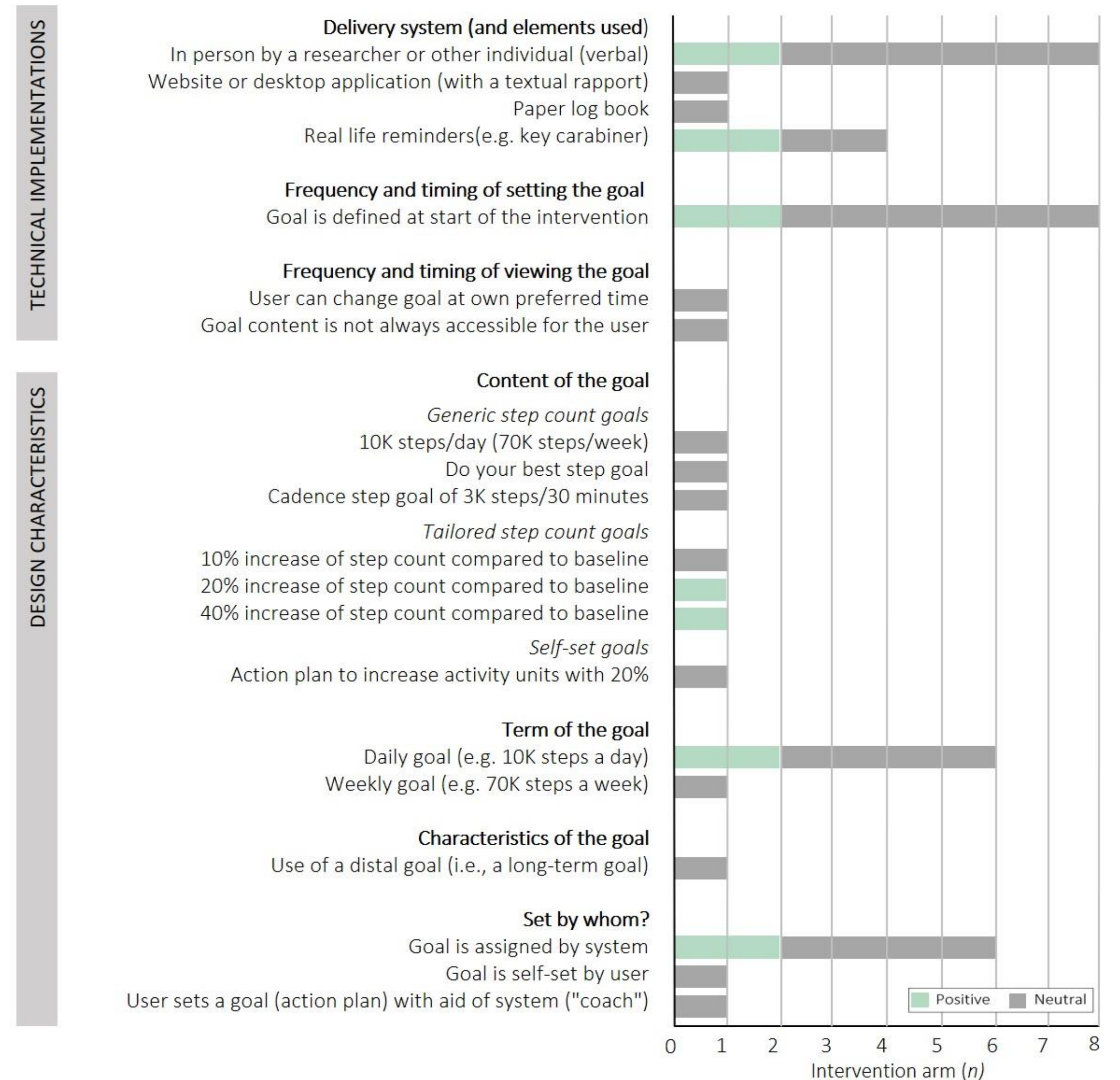
Figure 3: The identified technical implementations and design characteristics of goal setting in 23 studies (66 intervention arms)



Studies comparing implementations and designs

1. 8 studies compared designs (none examined implementations)
2. Challenging, tailored and adaptive goals are promising
3. Users likely prefer to set their own goal, but an assigned goal seems more effective in increasing PA

Figure 4 The effectiveness of adding goal setting with different technical implementations and design characteristics to the intervention compared to receiving no goals in 7 intervention arms (3 different studies)



CONCLUSION

The implementation and design of persuasive strategies can *influence the effectiveness* of the intervention. Future studies should therefore *critically consider* the different implementations and designs of the strategies when developing interventions and before drawing conclusions on the effectiveness of the strategy as a whole. *Future efforts* should be made to examine which implementations and designs are most effective.

[1] Mohr, D.C., et al., *The behavioral intervention technology model: an integrated conceptual and technological framework for eHealth and mHealth interventions*. J Med Internet Res, 2014. 16(6): p. e146.