Supplementary Materials

With reference to our concept of Educational and Social Exergaming (EASE) at home, we would like to suggest several directions for future research. All directions refer to previous conceptual and empirical works. We focus on possible research approaches (Table S1), the measurement of dependent variables (Table S2), and effects of exergaming elements (Table S3).

Supplementary Table S1. Directions for future research on Educational and Social Exergaming (EASE) at home, with a focus on possible research approaches.

Category	Possible directions and related exemplary references
Examinations of exergaming interventions at home aimed at…	…supporting physical and mental health (Gao et al., 2020; Santos et al., 2021), for instance, via community-based, family-based, and school-based programs (Christison and Khan, 2012; Baranowski et al., 2014; Rhodes et al., 2018)
	…relatedness and social support, for instance, by connecting players to other players (Chan et al., 2019), e-sports teams/leagues (Martin-Niedecken and Schättin, 2020), and gaming communities in general (Goodman et al., 2018)
	…promoting communication and media competences such as interpersonal competences and cooperative learning (Butera and Buchs, 2019; Segrin, 2019)
	…specific groups of people, such as children with special needs (Flynn and Colon, 2016), people with mobility impairments (Malone et al., 2019), and athletes performing high intensity interval training (Martin-Niedecken et al., 2020; Sá Filho et al., 2020)
	…therapeutic and rehabilitative applications (Ambrosino et al., 2020), including participants with chronic respiratory diseases (Simmich et al., 2019)
	…short- and long-term effects, with a focus on longitudinal studies (Gao et al., 2020; O'Loughlin, Dutczak et al., 2020; Standage and Ryan, 2020)
	…the evaluation and development of theoretical frameworks related to the abovementioned exergaming contexts. Critical conditions supporting theory development have been formulated (e.g., Rüth and Kaspar, 2017)
Examination of contrasts in exergaming contexts such as…	…exergaming types (e.g., dance games, sports games etc.) (Oliveira et al., 2020)
	…exergaming modes (e.g., single- and multiplayer settings with cooperation, competition, or coopetition) (Oliveira et al., 2020)
	…exergaming systems (e.g., augmented reality and virtual reality) (Ng et al., 2019)
	…exergaming activities (e.g., balance training, dancing, boxing, and tennis) (Street et al., 2017)
	…exergaming movements (e.g., whole body vs. lower body) (Gao et al., 2015)
	…exergaming contexts, for instance, same vs. other physical space (Peng and Crouse, 2013) or home-based vs. lab-based vs. field-based (Gao et al., 2015; Baranowski et al., 2016; Gao et al., 2020; Oliveira et al., 2020)
	…exergaming vs. other technologies, for instance, gamified apps or wearables (Yen and Chiu, 2019; Schmidt-Kraepelin et al., 2020), home exercising (treadmill, exercise bike, weights/resistance band etc.), and exercise programs (exercise apps, work out videos, virtual personal trainer, virtual workout groups etc.) (Rhodes et al., 2020)
Examination of moderators in exergaming contexts such as…	…predictors of physical activity (e.g., peer-modeling and physical self-concept, measured physical fitness, and variables related to social status) (Schmidt et al., 2019)
	…age (to consider developmental stages), culture (Baranowski et al., 2016), and other individual differences; for instance, competitive exergaming might not be the best choice to motivate people with low competitiveness (Song et al., 2013)
	…socioeconomic status and weight status (O'Loughlin, Dutczak et al., 2020)
	…gender, as outcomes for girls and boys may differ (Andrade et al., 2020)
	…group members' performance, as this could affect the effort individuals invest in the activity (Lee et al., 2017)

Supplementary Table S2. Directions for future research on Educational and Social Exergaming (EASE) at home, with a focus on the measurement of dependent variables.

Category	Possible directions and related exemplary references
Application of instruments regarding physical effects such as…	…physical activity levels: low physical activity, moderate to vigorous physical activity, and vigorous physical activity (Gao et al., 2015; Oliveira et al., 2020)
	…exercise-related outcomes: energy expenditure, heart rate, metabolic equivalent, perceived exertion, oxygen consumption, body composition, cardiovascular fitness (Gao et al., 2015), and step count (Oliveira et al., 2020)
	…weight-related outcomes: body weight, body fat, waist circumference, (non-)standardized body mass index (Oliveira et al., 2020)
	…wristbands, smartwatches, or smartphones with mobile apps (Yen and Chiu, 2019) or accelerometers (Hwang et al., 2018)
	…engagement in other forms of physical activity due to exergaming (transfer effects); for instance, whether exergaming only motivates people who already do frequently exercise to engage in other forms of exercise (Van Nguyen et al., 2017)
Application of instruments regarding non-physical effects such as…	…the Physical Activity Enjoyment Scale (PACES) (Moore et al., 2009)
	…the Basic Psychological Needs in Exercise Scale (BPNES) (Fernández-Espínola et al., 2020)
	…social support scales (e.g., Zimet et al., 1988; Reimers et al., 2012)
	…the Reasons to Exergame (RTEX) scale (O'Loughlin, Sabiston, et al., 2020) and the Motivation for Exergame Play Inventory (MEPI) (Staiano et al., 2019)
	…game experience scales, such as the Player Experience of Need Satisfaction (PENS) and the Game Experience Questionnaire (GEQ) (Johnson et al., 2018), and the Player Experience Inventory (PXI) (Abeele et al., 2020)
	…scales for behavioral addictions (e.g., gaming disorder scales for adolescents, Paschke et al., 2020)
	…several adverse outcomes, including violence, sexual permissiveness, and breach of privacy/confidentiality (Baranowski et al., 2016) or injuries and reduced sleep (O'Loughlin, Dutczak et al., 2020)
Application of measurements to assess educational outcomes such as…	…objective tests of knowledge and skills (e.g., Rey et al., 2020)
	…qualitative methods to investigate discussions (e.g., De Vet et al., 2012; Barnett et al., 2014)
	…mixed methods regarding exergaming (e.g., Rüth and Kaspar, 2020) or regarding video game discussions (Rüth and Kaspar, 2021)
Application of instruments of game-related outcomes such as…	…pre-game: previous experiences/skills, attitudes, behavioral intentions; for instance, via interviews, questionnaires etc. (cf. Mayer et al., 2014)
	…in-game: game performance (e.g., scores), game play (e.g., effort), game experience (e.g., flow); for instance, via questionnaires or data mining (cf. Mayer et al., 2014)
	…post-game: game experience (e.g., enjoyment), facets of satisfaction (e.g., attractiveness), and learning outcomes (e.g., skills); for instance, via interviews, questionnaires, data mining etc. (cf. Mayer et al., 2014)
Development and validation of measurement instruments…	…since validated measurement scales are partially missing for specific contexts (cf. Lee et al., 2017)
	…since existing instruments need further investigations (Hulteen et al., 2020) and may have different psychometric properties in different languages (Sattler et al., 2020)

Supplementary Table S3. Directions for future research on Educational and Social Exergaming (EASE) at home, with a focus on effects of exergaming elements.

Category	Possible directions and related exemplary references
Effects of basic exergaming elements such as…	…accurate, reliable, user-friendly, and affordable sensors (Baranowski et al., 2014)
	…game design elements, including interactivity, feedback, control, identity, immersion, and storytelling (Baranowski et al., 2016)
	…adaptive game mechanisms such as personalized difficulty to increase flow (Chan et al., 2019)
	…appropriate matchmaking strategies to increase social connectedness (Chan et al., 2019)
Effects of theory-related exergaming features such as…	…fulfilment of basic human needs (autonomy, competence, relatedness, and novelty) (cf. Fernández-Espínola et al., 2020; Vansteenkiste et al., 2020). For instance, game features that were expected to satisfy autonomy and competence needs in young adults were found to have small effects (Peng et al., 2012)
Effects of evidence-based design recommendations such as…	…regarding competence: provide feedback, challenge, and rewards (Chan et al., 2019)
	…regarding narrative transportation: use of game characters, considering ethnic similarity between game characters and players (Chan et al., 2019)
	…regarding relevance: use characters that players can self-identify with (Chan et al., 2019)
Effects of best practice principles such as…	…for different phases: acquisition, learning, and habitual use of exergaming (cf. Straker et al., 2015)
	…implementing health considerations in exergames, which were found to predict the exergaming behavior of college students (Su and Zeng, 2020)

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