

Self-Determination Theory and Nonlinear Pedagogy: An Approach to Exercise Professionals' Strategies on Autonomous Motivation

Teoría de la autodeterminación y pedagogía no lineal: un enfoque de las estrategias de los profesionales del ejercicio sobre la motivación autónoma

*, **Frederico Zarazaga Raposo, **, ***Paulo Caldeira, ****Rui Batalau, ***Duarte Araújo, *, ***** Marlene Nunes Silva

* Faculty of Physical Education and Sport, Lusófona University of Humanities and Technology (Portugal), **Universidade Europeia, Lisbon (Portugal), *** CIPER, Faculdade de Motricidade Humana, Spertlab, Universidade de Lisboa (Portugal),

****Instituto Superior Manuel Teixeira Gomes, (Portugal), ***** CIPER, Faculty of Human Kinetics, Lisbon University, (Portugal)

Abstract. Promoting adherence to exercise, especially in a long-term, remains a critical issue in fitness and wellness (F&W) context. Self-Determination Theory (SDT) and Non-Linear Pedagogy (NLP) have progressively established themselves as valid backgrounds for intervention in F&W context. Analysing the assumptions of both, seems to reveal points of contact and complementarities yet to be explored through experimental research. Autonomy, competence and relatedness are basic psychological needs (BPN) that motivational strategies based on SDT seek to satisfy, aiming autonomous self-regulation for exercise. NLP practice is centered in the performer-environment system exhibiting tasks that should be representative of the context of performance with adaptive variability; tasks should be simplified rather than decomposed. Task, individual and environmental constraints are considered and manipulated to guide the performer through a learning process according to the individual differences, promoting cooperation and stimulating decision. Research has demonstrated the determining importance of the type of exercise professionals' motivational practices, leading to a positive or negative impact on practitioners. These strategies may involve the diagnostic of action capabilities, and the use of Motivational Interview (MI) principles to facilitate the goal-setting process, manipulating task constraints, and using instructions as task constraints. The purpose of this manuscript is to discuss possibilities on how NLP can target autonomous motivation, based on SDT, resulting in a landscape of affordances for exercise and daily activities that promote autonomous motivation in the F&W context. To our better knowledge, NLP has never been considered neither in the scope of F&W, or as a facilitator of autonomous motivation.

Key words: Fitness and Wellness; Motivational Strategies; Self-determination Theory; Non-Linear Pedagogy; Ecological Dynamics; Autonomy Support; Motivational Interview; Exercise Professionals

Resumen. Promover la adhesión al ejercicio, es un problema en la condición física y bienestar (CF&B). La teoría de la autodeterminación (TAD) y pedagogía no lineal (PNL) se han consolidado como válidos para la intervención en la CF&B. Ambos parecen tener puntos de contacto y complementariedades aún por explorar a través de la investigación. La autonomía, competencia y relación son necesidades psicológicas básicas que las estrategias motivacionales basadas en TAD buscan satisfacer, con vista a la regulación autónoma para el ejercicio. La PNL se centra en el sistema de entorno del ejecutante que presenta tareas representativas del contexto con variabilidad adaptativa; Las tareas deben simplificarse y no descomponerse. Las restricciones de tareas, individuales y ambientales se manipulan para guiar al ejecutante a través de un proceso de aprendizaje de acuerdo con diferencias individuales, promoviendo la cooperación y estimulando la decisión. Se ha demostrado la importancia de estas prácticas motivacionales de profesionales y su impacto positivo o negativo. Estas estrategias pueden implicar con el diagnóstico de capacidades de acción, y el uso de los principios de la entrevista motivacional (EM) para facilitar el establecimiento de objetivos, manipulando las restricciones de tareas y utilizando las instrucciones como restricciones. El propósito de este manuscrito es discutir cómo puede la PNL enfocarse en la motivación autónoma, basada en el TAD, dando como resultado los recursos para el ejercicio y actividades diarias que promueven la motivación autónoma en la CF&B. Para nuestro conocimiento, la PNL nunca ha sido considerada en el CF&B, ni como facilitadora de la motivación autónoma.

Palabras clave: Fitness y Bienestar; Estrategias motivacionales; Teoría de la autodeterminación; Pedagogía no lineal; Dinámica ecológica; Apoyo a la autonomía; Entrevista motivacional; Profesionales del ejercicio.

Introduction

Global physical inactivity pandemic affects more than one third (31.1%) of world adult population (Hallal et al., 2012), it is the cause of 6-10% of non-communicable diseases, 9% of premature deaths (Lee et al., 2012), and is associated with more than 5 million deaths per year. Exercise's preventive role in health and quality of life is unquestionable (Curtis et al., 2017). In a recent review, Pedersen and Saltin (2015) provided an evidence-based basis, for prescribing exercise as medicine in the treatment of 26 different diseases.

Promoting adherence to exercise, especially in a long-

term, remains a critical issue: not only adherence rates are low, but also 50 to 65%, of those who start to do some form of physical activity drop-out in the following 3 to 6 months (Annesi & Unruh, 2007). In Portugal, only 5% of total population exercises or plays sport regularly (Eurobarometer, 2018). Following the same report, from those, 27% chose to do it in gym context (15% in European Union), which represents an increase from 17% in 2013 to 27% in 2017. Despite the huge offer, of exercise programs, in quantity and diversity, allowing the participants to choose what, how and where they want, the dropout is still very high (in Portugal, the dropout rate is above 60% (AGAP, 2017), not allowing the practitioners to benefit from regular exercise outcomes, since many are permanently in a vicious cycle between active and inactive lifestyles (Sallis et al., 1990). Facing this numbers, it is vital to analyse and eventually re-think the

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Frederico Zarazaga Raposo
frederico.raposo@universidadeuropeia.pt

motivational and pedagogical practices implemented in fitness and wellness context, in order not only to increase the number of persons that choose this exercise setting, but also to promote long-term adherence to exercise programs (Silva et al., 2017). Exercise professional's role can be crucial in promoting or thwarting exercise behaviour and related motivation (Ryan, Williams, Patrick, & Deci, 2009; Teixeira, Carraça, Markland, Silva, & Ryan, 2012), as the motivational practices used can positively or negatively affect the practitioner's exercise experience (Ng, Thøgersen-Ntoumani, & Ntoumanis, 2012; Ntoumanis, Thøgersen-Ntoumani, Quested, & Hancox, 2017).

Following this, the purpose of these manuscript is to discuss possibilities on how Non-Linear Pedagogy (NLP) can target autonomous motivation, based on Self-determination Theory (SDT), resulting in a landscape of affordances (i.e. opportunities for action), for exercise and daily activities that promote autonomous motivation in the Fitness and Wellness (F&W) context.

Self-determination Theory

Self-determination Theory (Deci & Ryan, 1985; Deci & Ryan, 2000) is a contemporary framework, frequently used to study and understand human motivation, applied in several distinct contexts, namely in physical activity (exercise, sport and physical education) (Ng, Ntoumanis, et al., 2012; Teixeira et al., 2012). It distinguishes between optimal (e.g., autonomy-supportive) and non-optimal (e.g., controlling) behaviors of those in position of authority (e.g. parents, teachers, coaches, doctors, etc) (Van den Berghe et al., 2013). SDT distinguishes two types of motivation: one with a higher quality, self-determined or autonomous, the other with less quality, controlled or amotivated (Deci & Ryan, 2000), and proposes a continuum in which motivational self-regulation changes from amotivation to intrinsic motivation. These variations have important implications in physical and psychological well-being of the individual (Ryan & Deci, 2000). The distinction between autonomous and controlled motivation is essential: Autonomous motivation involves the regulation of behavior with the experiences of volition, psychological freedom, and self-endorsement, the behavior has an internally perceived locus of causality. Autonomous forms of motivation are: intrinsic motivation (to perform an activity, for its own satisfaction, pleasure and/or challenge), and both integrated regulation (the synthesis of various identifications to form a coherent sense of self, a process that likely requires considerable effort and self-awareness) and identified regulation (guided by personal values and self-endorsed commitments). In contrast, controlled motivation involves the regulation of behavior based on pressure and imposition to think, feel or behave in particular ways, reflecting an external perceived locus of causality. Both introjected (i.e. internal pressures to comply with a partially internalized contingency to gain pride and self-esteem, or to avoid feelings of guilt and shame) and external regulation (i.e. external pressures to obtain a reward or avoid punishment) are controlled forms of motivation. Autonomous and controlled motivation contrast with amotivation, being the later defined by a lack of intentionality towards a given behavior. Such lack of

intentionality can result from non perceiving (or non valuing) the relationship between behavior and its outcomes, or from feeling incapable to perform the behaviors necessary to achieve the desired outcomes (Vansteenkiste, Niemiec, & Soenens, 2010). SDT postulates the existence of three basic psychological needs (BPN; autonomy, competence, and relatedness) innate to all human beings, whose satisfaction translates into an universal experience of physical and psychological well-being and autonomous motivation (Deci & Ryan, 2000; Teixeira et al., 2012; Vansteenkiste et al., 2010). Inversely, active thwarting of these needs, potentially promotes more controlled forms of motivation and subsequent adverse results (Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2009). According to SDT, social environment may or may not support, basic needs satisfaction fostering more autonomous or controlled types of motivation (consequently increasing the probability to integrate and maintain the behavior) (Ryan & Deci, 2000).

Motivational Strategies

It is widely documented the paramount role that exercise professionals have on the promotion of healthy and active lifestyles, and physical activity long term adherence, as their pedagogical strategies directly impact the exercisers' experiences (Taylor & Ntoumanis, 2007; Deci & Ryan, 2000; Rodrigues et al., 2018; Teixeira et al., 2012). According to a recent review (Rodrigues et al, 2018), interventions based on SDT promote the maintenance of long-term exercise practice. It is also widely documented, the need to focus on professional's motivation and motivational strategies used with their participants, as they may or may not facilitate behavioral changes (Ntoumanis et al., 2017; Rodrigues et al., 2018; Taylor, Ntoumanis, & Standage, 2008). Strategies used by exercise professionals may reflect two different interpersonal styles: autonomy support or control (Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2010). Professionals who support autonomy, promote the will (autonomous motivation) of those with whom they interact, by providing a number of options to choose from, providing a significant and realistic rationale in the cases where choice is restricted, trying to understand other's perspective (Assor, Roth, & Deci, 2004). An autonomy-supportive approach would be characterized by: i) adopting exercise participants' perspective by welcoming exercisers' thoughts, feelings, and behaviors; and ii) supporting participants' long-term development and capacity for autonomous self-regulation for exercise (Reeve, 2009). Autonomy-Supportive strategies have three dimensions: Autonomy support, which means minimizing pressure to engage in behaviors, encouraging practitioners to exercise for their own reasons and in line with their personal goals and values; Structure, that concerns helping participants to develop clear expectations, encouraging them to believe that they are capable of successfully engaging in a task, and the provision of positive feedback regarding progress; and Involvement, which means the practitioners perceive that exercise professionals are genuinely interested in them and their well-being (Markland & Tobin, 2010). In contrast, controlling professionals, seek to direct thoughts, feelings and behaviors of those with

whom they interact. They may use overt pressuring strategies (e.g., controlling language, punishments), or other less evident techniques of manipulation, including conditional regard (Assor, Roth, & Deci, 2004), guilt induction (Vansteenkiste, Simons, Lens, Soenens, & Matos, 2005) and shaming (Soenens, Vansteenkiste, & Luyten, 2010). A controlling motivational style can both be direct or indirect (Assor, Kaplan, Kanat-Maymon, & Roth, 2005; Assor et al., 2004; Vansteenkiste et al., 2005). In sports and exercise context, there have been described five separate controlling motivational strategies (Bartholomew et al., 2010): i) controlling use of rewards, that means providing tangible rewards as an incentive for completing a task, or a goal; ii) negative conditional regard, which is withholding love, attention and affection when desired attributes or behaviors are not displayed by practitioners; iii) intimidation, that involves the display of power assertive strategies, designed to humiliate and belittle (eg. verbal abuse, threats, yelling); iv) excessive personal control, that involves the use of intrusive monitoring, and the imposition of strict limits and v) judging and devaluating, that means denying other's thoughts and feelings, in a way to obtain certain outcomes as winning or reaching a specific goal.

Despite all evidence suggesting the importance of autonomy supportive strategies as related with higher wellbeing, better performance, behavior resiliency, physical and mental health outcomes (Ng, Ntoumanis, et al., 2012; Reeve, 2009; Taylor & Ntoumanis, 2007; Teixeira et al., 2012; Vansteenkiste et al., 2010), and highlighting the deleterious consequences of the use of controlling strategies, even for the exercise professional himself (e.g. contributing for emotional exhaustion) (Silva et al., 2010), many exercise professionals continue to adopt a controlling motivational style. The argument is that these types of strategies will create more demand and promote a more intense practice, and thus creating an environment more prone for reaching exercise goals (Ntoumanis et al., 2017).

Nonlinear Pedagogy

Grounded on ecological dynamics (Araújo, Davids, & Hristovski, 2006), Nonlinear Pedagogy (NLP) is a theoretical framework that informs coaches and teachers to design representative learning environments (Renshaw et al., 2015). NLP practice is centered in the performer-environment system exhibiting tasks that should be representative of the context of performance with adaptive variability (Caldeira, Paulo, Infante, & Araújo, 2019); tasks should be simplified rather than decomposed (Chow, Davids, Hristovski, Araújo, & Passos, 2011). Task, individual and environmental constraints are considered and manipulated to guide the performer through a learning process according to the individual differences, promoting cooperation and stimulating decision-making (Lee, Chow, Komar, Tan, & Button, 2014). Research on NLP has been conducted in skill acquisition (Chow, 2013) and theoretical and empirical exploratory work have linked the use of NLP principles to increased feelings of competence, relatedness and autonomy (Chang et al., 2017; Renshaw et al., 2015; Renshaw, Oldham, & Bawden, 2012). A finding that can speak to the potential links between NLP and SDT.

However, to our better knowledge, NLP has never been considered neither in the scope of F&W, or as a facilitator of autonomous motivation.

Representative Context of Practice

The context of practice should provide affordances that are representative of the performance context (Pinder, Headrick, & Oudejans, 2015). In F&W scenarios participants are mainly non-athletes, quite heterogeneous in age, physical fitness and limitations (ACSM, 2018). Daily life routines should be regarded as their context of performance and both architecture and task design, can contribute to involve the participants in a landscape of affordances, that ensure relevant information and allows action based on that information. F&W activities often occur in sports facilities, which would benefit from the perspective mentioned above (i.e. they should represent most of the environmental constraints to the performer-environment system). Architecture can be based on a more holistic relationship, between buildings and nature accounting for users feelings and emotions (Kim & Park, 2018), and task design should promote adaptive behavior, that emerges from the reciprocal relationship between perception and action (Pinder, Davids, Renshaw, & Araújo, 2011b).

Adaptive Variability

In Nonlinear Pedagogy, adaptive variability is not considered detrimental noise, but rather a fundamental feature of learning and performance (Davids, 2012). In this perspective, participants should be encouraged to actively seek goal-achievement by different processes, and experiment that the same process can conduct to different solutions (Seifert, Komar, Araújo, & Davids, 2016). Trainers should infuse constrained variability, according to the participant and task goals (Ranganathan & Newell, 2013). In typical F&W facilities, participants can have different degrees of training support, ranging from almost none to individualized one-on-one coaching, but, in either case, adequate assessments and careful goal-setting are crucial to determine how and how much variability should be present in practice.

Task Simplification

Information and action coupling is fundamental to ensure task representativeness, as the participants explore movement functional solutions (Pinder, Davids, Renshaw, & Araújo, 2011a). Decomposing movement into parts usually disrupts the necessary coherence to the movement pattern to be learned/trained, particularly in complex movements (Renshaw, Chow, Davids, & Hammond, 2010). Everyday life movements are usually complex and not done in isolation which emphasizes the need to maintain in training tasks information that can regulate action.

Self-Determination Theory and Nonlinear Pedagogy Complementarity

It is important to mention that SDT and NLP have different

epistemological foundations, which we will not attempt to conciliate here. SDT is a meta-theory grounded on an organismic view, assuming the interplay between mental processes, behavior and environment; whereas NLP assumes a direct contact between organism and environment, i.e., behavior's level of analysis is at the organism-environment system's level. However, the common ground for discussing complementarity is the pragmatist view that both approaches share of how to increase the number of persons that choose to exercise in F&W settings, and how to promote long-term adherence to exercise programs. Like SDT, it is our proposition that also NLP framework can concur positively to autonomous motivation in F&W participants, since autonomy, competence and relation can be developed during exercise sessions (Deci & Ryan, 1985; Deci & Ryan, 2000; Chang et al., 2017; Renshaw et al., 2012; Renshaw et al., 2015). This relationship has already been explored empirically (Lee et al., 2017) and theoretically, in the physical education context (Moy et al., 2015) and in the sports context (Renshaw et al., 2012; Renshaw et al., 2015), but to the best of our knowledge, not in the exercise (fitness and wellness) contexts. For exploring the complementarity between these models, we start by addressing coaching options (summarized in Table 1), for designing practice. The starting point for an exercise professional should be based on i) representative diagnostic, ii) effective goal-setting iii) manipulating task constraints and iv) assertive instructions. In these stages of the training session, principles of SDT and NLP can communicate to inform the trainer how to create an effective landscape of affordances towards a more autonomous regulation for exercise, which hopefully means higher levels of intrinsic motivation, ultimately related with long-term exercise adherence (Teixeira et al., 2012).

Diagnostic

Representative diagnostic assessment of action capabilities is crucial to further adequate practice design and posterior goal setting. Diagnostic validity is predicted on action fidelity and functionality of evaluation task design. Action fidelity ensures that behavior during assessments, corresponds to the behavior in real contexts, and functional evaluation tasks maintains perception and action coupling, based on similar sources of the information available in performance contexts (Davids, Araújo, Vilar, Renshaw, & Pinder, 2013). In addition to these principles of diagnostic, a large number of F&W participants can benefit from the implementation of Motivational Interviewing (MI) principles by exercise professionals, in order to change several health related behaviors (physical activity, exercise, nutrition, weight management, smoking). MI and SDT principles, are outlined and parallels between them are drawn out (Deci & Ryan, 2000; Markland, Richard, Tobin, & Rollnick, 2005). MI is defined as a collaborative, person-centered form of guiding, to elicit and strengthen motivation for change (Miller & Rollnick, 2012). Recent descriptions of MI include three elements: i) MI is a particular kind of conversation about change (counseling, therapy, consultation, method of communication); ii) MI is collaborative (person-centered, partnership, honors autonomy, not expert-recipient); iii) MI

is evocative (seeks to call forth the person's own motivation and commitment). The main strategies of MI approach are: i) Get a conversation going - express empathy through reflective listening; ii) Develop discrepancy between participants' goals and values and their current behavior; iii) Avoid argument and direct confrontation and adjust to resistance rather than opposing it directly; iv) Support self-efficacy and optimism (Miller & Rollnick, 2012).

Goal Setting

Goal setting is a critical and sensitive step in exercise programming. Both practice and behavioral goals should be a joined venture, between trainer and trainee, informed by the previous diagnostic. Planning together a path to improvement, will not only promote more representative individualized choices for practice, but also will reinforce the verbalization of participants' own behavioral goals and exploration of the strategies through which these goals can be accomplished (Silva et al., 2011), potentially favouring participants' enhanced feelings of autonomy, competence and relatedness. Needs satisfaction, is directly related to the concept that different regulatory processes underlying goal pursuits, are associated with effective functioning and well-being, and also that different goal contents have different relations to the quality of behavior and mental health (Deci & Ryan, 2000). Nonlinear characteristics of skill acquisition (Newell, Liu, & Mayer-Kress, 2001), should be attended, and therefore planning should embed flexibility, regarded as an on-going process incorporating daily information (Kiely, 2012). A broader investment in goal setting can be made for F&W participants, one that goes beyond training practice and extends to their daily life increasing motivation. Motivation for change occurs when people perceive a mismatch between «where they are, and where they want to be», and a counselor practicing MI works to develop this, by helping participants examine the discrepancies between their current behaviors and those they want to achieve (Miller & Rollnick, 2012).

Manipulating Task Constraints

In NLP task constraints are manipulated to guide participant's actions to the intended goals. Exploration of functional solutions is facilitated by manipulation of goals, practice space and equipment (also rules in sports and learning games scenarios) (Chow et al., 2011). F&W professionals should carefully manipulate task constraints attending to precedent phases of diagnostic and goal setting and make the best use of facilities characteristics and equipment available. In common F&W facilities a wide range of equipment is usually available, however, is of most importance to realize that not all equipment is adequate to all persons and that not all equipment permits a representative context of practice.

When participants recognize that their current behaviors place them in conflict with their values or interfere with accomplishment of self-identified goals, they will be more likely to experience increased autonomous motivation to make specific life changes. The micro counseling skills (OARS

acronym) consist in Open Ended Questions, Affirmations, Reflections, and Summaries, which are core strategies, employed to move the process forward, by establishing a therapeutic alliance and eliciting discussion about change (Miller & Rollnick, 2012).

Instructions

SDT supports that in order to promote positive experiences and satisfaction towards exercise it is of paramount importance that exercise professionals understand and incorporate autonomy supportive strategies in their instructions and feedback, during their exercise sessions. The language used by exercise professionals to instruct exercise tasks, is of paramount importance. In NLP instructions are regarded as informational constraints that guide the participants search for functional solutions of movement (Pinder et al., 2011a). Instructions, in NLP are not prescriptive or authoritarian, but facilitators of discovery and so, able to strengthening the relation between trainer and trainee, while promoting autonomy (Chang et al., 2017; Renshaw et al., 2015). Instructions as constraints are task and individual dependent, taking into account the individual intrinsic dynamics (Kelso, 1995; Newell & Ranganathan, 2010), Respect for the participants coordination and tendencies enables a more representative task design, thus promoting a greater feeling of competence.

Table 1.
Practical suggestions for Exercise Professionals to support practitioner's autonomous motivation (using both SDT and NLP)

Global Strategies
<ul style="list-style-type: none"> •Welcome exercisers' thoughts, feelings, and actions •Minimize pressure to engage in behaviors •Encourage practitioners to exercise for their own reasons and in line with their personal goals •Help participants to develop clear expectations •Encourage participants to be confident they are capable of successfully engaging in a task •Provide stimulating feedback regarding progress •Support self-efficacy and realistic optimism •Allow practitioners to perceive exercise professionals are genuinely interested in them and their well-being
Diagnose Strategies
<ul style="list-style-type: none"> •Get a conversation going - express empathy through reflective listening •Adequate diagnostic to be representative, to determine how and how much variability should be present in practice •Apply micro counseling skills (OARS acronym)
Goal Setting Strategies
<ul style="list-style-type: none"> •Encourage participants to actively seek goal-achievement by different processes •Help participants to set effective goals •Avoid argument and direct confrontation and adjust to resistance rather than opposing it directly •Plan together a path to improvement •Help participants to set goals that go beyond training practice and extend to participants' daily life •Help participants examine the discrepancies between their current behaviors and those they want to achieve
Exercise Intervention Strategies
<ul style="list-style-type: none"> •Carefully manipulate task constraints attending to precedent phases of diagnostic, goal setting and individual differences to make the best use of facilities and equipment available •Design tasks representative of the context of performance with adaptive variability •Simplify tasks, rather than decomposing it •Promote practice contexts that provide affordances that are representative of the performance context •Consider daily life routines as the context of performance •Design tasks that promote adaptive behavior, by means of exploration •Include constrained variability in the session, according to the participant's characteristics and task goals •Assertive instructions •Plan with flexibility, regarding an on-going process, that incorporates daily information •Use instructions that facilitate discovery, instead of prescriptive or authoritarian ones •Take into account the individual intrinsic dynamics, when instructing

Conclusions

Developing more effective exercise promotion interventions and practices, is an urgent requirement, considering the actual numbers of adherence and dropout in Fitness and Wellness contexts. Understanding the

mechanisms behind the development of autonomous regulation, widely viewed as a predictor of continued behavioral adherence is of paramount importance. This paper was intended to discuss a model under SDT and NLP frameworks, offering an applied approach.

Research has shown the importance of increasing the focus on making exercise a positive and meaningful experience. External (and introjected) contingencies can produce results, but they are a short-term solution, for a long-term problem (Silva, 2011). Maintenance of exercise is fundamentally related to the process and the quality of exercise participants' experience, thus exercise professionals' practice design is of high importance. These strategies start with the diagnostic of action capabilities, using MI principles to facilitate the goal-setting process, manipulating task constraints, and using instructions as task constraints. The landscape of affordances designed following this approach, may promote competence and confidence, through more identified and intrinsic motives to exercise, promoting long-term behavior change.

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