An intervention to train group exercise class instructors to adopt a motivationally adaptive communication style: a quasi-experimental study protocol

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An intervention to train group exercise class instructors to adopt a motivationally adaptive communication style: a quasi-experimental study protocol

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Introduction: According to self-determination theory (SDT), individuals in position of authority can have a powerful impact on the motivation of the individuals they instruct via the type of communication style they use. This paper describes (a) the rationale for and development of an SDT-based motivation communication training package for group exercise instructors and (b) the design and protocol for an intervention study to evaluate the implementation of this intervention. *Methods and analysis:* Fifty indoor cycling class instructors will be assigned to either an intervention group ($n = 25$) or a control group ($n = 25$). Over a 10-week period, instructors in the intervention group will complete a multiphase SDT-based communication training programme. The evaluation package will comprise qualitative and quantitative assessments of the motivationally relevant features of the class environment as well as motivation and well-being variables, undertaken by both exercise class members and instructors. Baseline quantitative data collection will take place up to one month prior to the start of the intervention and be re-administered within one month following the end of the intervention period. Quantitative data will be analysed using multilevel growth modelling. Follow-up semi-structured interviews with instructors and exercise class members will be conducted four to six weeks following the end of the intervention to explore perceptions of the training programme. All interviews will be analysed using inductive thematic analysis. *Ethics and dissemination:* The study has been granted ethical approval from Curtin University Ethics Board. The findings of the study will be disseminated through peer-reviewed journals and conference presentations. Trial Registration: ANZCTR.org.au: ACTRN12615000036516.

Keywords: self-determination; exercise; instructor; motivation; indoor cycling

1. Introduction

A large proportion of the adult population starts a fitness regime at some point in their life; however, approximately half or less adhere to this regime for more than six months (Berger, Pargman, & Weinberg, 2002). Furthermore, a vast proportion of exercisers experience numerous relapses, defined as not exercising for three months or more (Sallis et al., 1990). Such relapses and rates of dropout are problematic given that important health outcomes (e.g. coronary heart disease

and type 2 diabetes mellitus) can only be achieved with sustained exercise participation (Reiner, Niermann, Jekauc, & Woll, 2013).

Group exercise instructors play an important role in influencing their clients' motivation to engage in and sustain regular exercise via the communication style they employ (Edmunds, Ntoumanis, & Duda, 2008). There has been extensive research in various life settings, including health, which has used self-determination theory (SDT; Deci & Ryan, 1985, 2002) to identify different types of communication/instructional styles that can support or undermine individuals' motivation and, in turn, their engagement in an activity. However, research that identifies how to effectively train group exercise instructors to use adaptive motivational strategies is still scarce. Thus, the aim of this intervention study is to develop, implement, and evaluate an SDT-based motivation communication training intervention in the context of group exercise classes.

1.1. *Motivationally adaptive and maladaptive communication styles*

A motivationally adaptive communication style (also called a need-supportive style in the SDT literature) is characterised by the provision of autonomy support, structure, and interpersonal involvement (Reeve, Deci, & Ryan, 2004). An autonomy supportive instructor acknowledges exercisers' feelings and perspectives; encourages choice and initiative; and identifies, nurtures, and develops exercisers' interests and goals (Black & Deci, 2000; Reeve, 2006). Structure refers to the degree to which the instructor provides clear guidance, consistent expectations, and timely and informative feedback (Reeve, 2002). Interpersonal involvement (also referred to in the literature as relatedness support) is evident when an instructor dedicates psychological resources, such as time and energy, to interact in a way which offers exercisers affection, warmth, and care (Deci & Ryan, 1991; Reeve, Jang, Carrell, Jeon, & Barsh, 2004).

Despite the potential benefits of a need-supportive communication style, evidence suggests that the fitness industry is often dominated by more motivationally maladaptive approaches (Hancox, Ntoumanis, Thøgersen-Ntoumani, & Quested, 2015). This includes the promotion of a "no-pain, no-gain" culture and the use of extrinsic rewards to encourage retention of gym members. For example, a group exercise instructor can be motivationally undermining by not offering choice and task variety to exercisers, or by being dismissive of their input and suggestions (Edmunds et al., 2008). Training instructors to motivate participants in a way that will sustain their exercise engagement is not a core element of most instructor training programmes. Thus, there is a need to develop theoretically and empirically rigorous principles of a motivationally adaptive/need-supportive communication style in these training modules.

1.2. *Is it possible to teach exercise instructors to be more need supportive?*

Previous intervention work has shown that it is possible to train individuals in position of authority in various life settings (e.g. teachers, coaches, and health-care staff) to use a need-supportive communication style (Ng et al., 2012). Studies reporting the training of exercise/fitness advisors are scarce; such studies have mainly focused on the outcomes of the training in terms of exercisers' motivation and behaviour and less so on how the advisors were trained and whether such training was feasible and subsequently utilised with high levels of fidelity. The first study on this topic was by Edmunds et al. (2008) who trained one group exercise instructor to deliver a 10-week exercise programme either in a need-supportive style (*n* of exercisers = 25), or in a "typical" (*n* = 31) style. Findings revealed that exercisers in the experimental condition attended more exercise sessions and reported a more need-supportive instructor style, greater satisfaction of their needs for competence and relatedness, and more positive affect. However, the same single instructor was used in both conditions, which is a significant limitation of this study. A single

fitness consultant was also used by Fortier et al. (2011) who delivered 7 one-to-one SDT-based counselling sessions over 3 months to 61 individuals who were not sufficiently physically active (control $n = 59$). The results showed increases in physical activity in the experimental group during the intervention, but these increases were not maintained at a 3-month follow-up. Duda et al. (2014) reported the results of a randomised control trial (RCT) in which 14 health and fitness advisors attended group and one-to-one training sessions based on the SDT principles. These advisors then delivered one-to-one consultations with obese individuals ($n = 347$) who were referred to an exercise programme by their general practitioner (GP). Results revealed that the exercisers' perceptions of a need-supportive communication style did not differ by arm, but those in the intervention group reported lower anxiety and better quality of life.

Behaviour change techniques are recognised to be an important consideration in studies targeting changes in physical activity and other health behaviours in the general population (Michie & Johnston, 2012). A focus on behaviour change techniques is also important when training exercise instructors to be more need supportive. The effectiveness of such interventions relies upon the instructors not only understanding and endorsing the importance of being need supportive, but also having the capacity to change their behaviour and apply the targeted motivational strategies effectively. To date, the majority of studies that have set out to train exercise instructors to more effectively motivate have either neglected to report any behaviour change techniques employed, or have used vague terminology and/or provided insufficient detail to facilitate replication. Michie et al. (2011) have proposed the Coventry, Aberdeen & London – Refined (CALO-RE) taxonomy which can be used to guide the design and reporting of behaviour change techniques employed in interventions. The application of the CALO-RE taxonomy could be an important step forward in improving the implementation and reporting of behaviour change techniques utilised in SDT-based motivation interventions in the physical domain. To support instructors in changing their behaviour, the delivery of our education package utilises behaviour change techniques outlined in the CALO-RE taxonomy, such as barrier identification and resolution; and promoting self-monitoring of behaviour and outcomes.

1.3. *The proposed study*

The proposed study will build upon previous studies that have trained exercise and fitness advisors to utilise a need-supportive communication style. We will extend these studies in numerous ways. Specifically, we will (1) identify and provide detailed descriptions of specific strategies that can be used by instructors to support the motivation of their exercisers, (2) train instructors not only to use more adaptive strategies but also on how to minimise the use of maladaptive strategies; a detailed description of the latter will also be provided, (3) provide multiple training workshops combining theory and practical application, (4) supplement the face-to-face workshops with online material and discussion forums, as well as with various "homework" exercises, (5) underpin the design and delivery of our instructor training with contemporary behaviour change strategies, (6) film instructors' classes before and after the training to assess intervention fidelity and to objectively measure changes in communication style, (7) assess the impact of the intervention on the exercisers' and the instructors' motivation, and (8), in addition to obtaining questionnaire data, also interview instructors and exercisers to establish the feasibility of the training, as well as its effects on the exercisers' motivation and other related variables.

In our study, we will develop and test an SDT-based intervention customised for indoor cycling instructors. Indoor cycling classes offer a structured group exercise experience; hence, the findings of this study are potentially applicable to other types of structured exercise. Consultation will be sought with experienced instructors to ensure that intervention materials are appropriately adapted for the setting and population under study. Drawing from the SDT literature

(e.g. Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2009; Mageau & Vallerand, 2003; Reeve & Jang, 2006; Van de Berghe et al., 2013), we will identify which motivationally adaptive and maladaptive strategies are most applicable to the indoor group cycling context and how these strategies may be operationalised within this context. The training programme will focus on encouraging instructors to try to maximise their use of motivationally adaptive strategies and minimise or replace their use of motivationally maladaptive strategies.

We will examine the feasibility of intervention delivery and implementation, and pilot-test the effects of the intervention on exercisers' perceptions of their instructors' communication style, psychological need satisfaction, self-determined motivation, subjective vitality, and intention to continue. More specifically, the key objectives of this intervention are (i) to determine the acceptability of the intervention; (ii) to estimate rates of recruitment, retention, and adherence; (iii) to test assessment procedures, the use of new methods (e.g. self-reflection blogs and Facebook group); (iv) to test the integrity of the study protocol for a future RCT; and (v) to gain initial estimates for sample size calculation for a future RCT.

2. Methods and design

2.1. Study design and setting

A pilot study with elements of feasibility will be used to (i) determine the acceptability of a SDT-based communication training intervention for group cycling instructors and (ii) test procedures, methods, and protocol for a future RCT. Participants will be indoor group cycling instructors and the exercisers who participate in one of their regular classes. An opportunity sample of indoor group cycling instructors who teach classes in fitness centres in Perth (and surrounding suburbs), Western Australia, will be recruited. The study will be a parallel group, two-arm, quasi-experimental design with 1:1 allocation ratio. Twenty-five instructors will be assigned to the intervention group and 25 instructors will be assigned to the control group. Instructors will be the unit of group assignment. Random assignment of instructors to treatment groups will not be possible due to the possibility of contamination (i.e. control group instructors learning about the training received by intervention instructors), given that all instructors will be recruited from a relatively small geographical area. Exercise participants will be blinded to the treatment group of their instructor. Instructors in the intervention group will be asked not to tell their class members about the training that they are receiving. Outcome measures will be collected at baseline and 20–23 weeks later. See Figure 1 for an overview of the study design and major components. This protocol paper has been written in accordance with the SPIRIT (Standard Protocol Items: Recommendations for Interventional Trials) 2013 guidelines.

2.2. Sample size calculation

Power was calculated using Optimal Design Software (Spybrook et al., 2011). Estimates were based on a 2-level intervention (participants nested within instructors), assuming an average class size of 15 participants, 2 time points, an intra-cluster correlation coefficient (ICC) of 0.05, and $\delta = 0.34$ to detect changes between the groups in perceptions of instructor motivational style. Thirty-five instructors would be needed to achieve power at 0.80 with alpha at 0.05. To account for possible attrition, we will aim to have a combined sample of 50 instructors.

2.3. Participant recruitment and eligibility

Instructors will be recruited partly via contact details provided by Les Mills International and also sourced from web searches for indoor cycling classes in the Perth Metropolitan area. To be
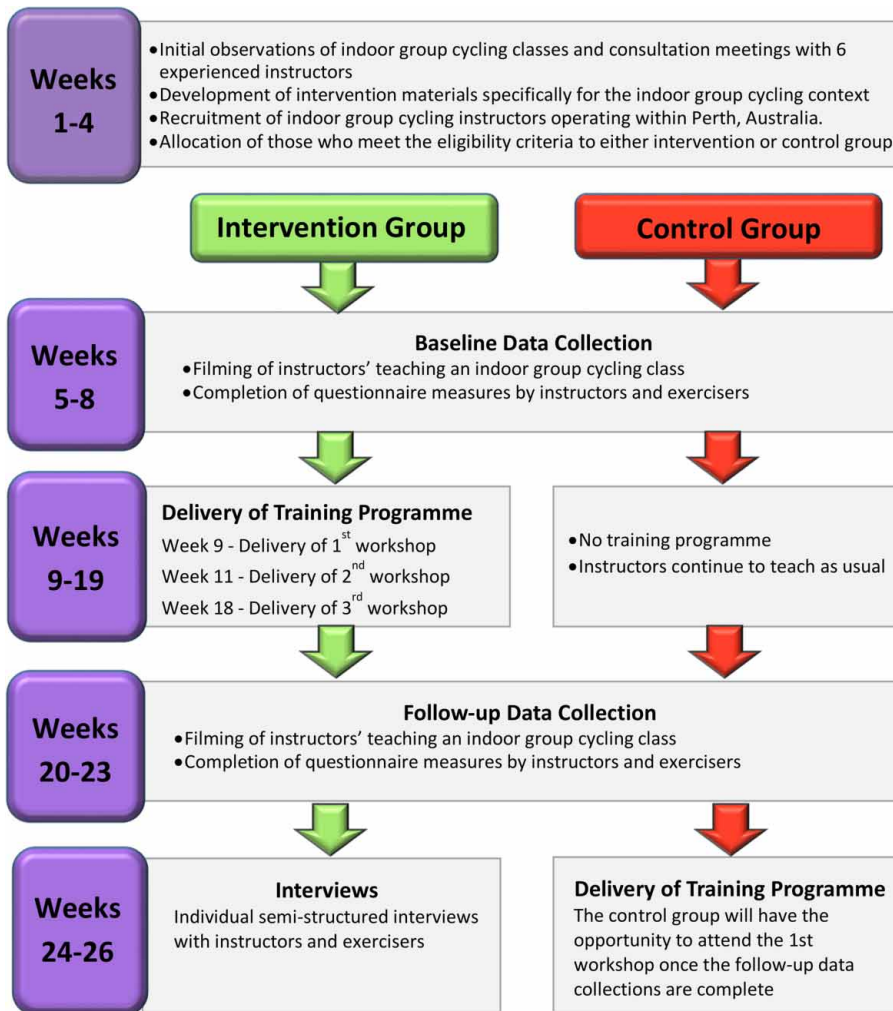
Figure 1.   Overview of the study design and major study components.

eligible to participate, instructors will need to (i) be aged 18 years and over, (ii) be a certified indoor group cycling instructor, and (iii) teach at least one indoor group cycling class per week on a regular basis (i.e. teach the same class every week).

Class members (male and female) will be recruited from one pre-identified group cycling class taught by each of the recruited instructors. At a time prearranged with the relevant instructor, a trained researcher will attend the specified class and verbally explain the study to the class members. Each class member will be issued an information sheet providing full details of the study and those willing to participate will be asked to complete the consent form and a question-naire pack on the two specified occasions (see online supplementary files for model information sheet, consent form, and questionnaires). Class participants will need to meet the following eli-gibility criteria: (i) be aged 18 years and over, (ii) attend the pre-identified class on a regular basis, and (iii) be willing and able to complete and return the questionnaire pack to the researchers within the specified time periods.

2.4. *The intervention*

The intervention will be designed to train group exercise instructors to develop a more motiva-
tionally adaptive communication style when leading group cycling classes. The multi-component
intervention will be grounded in SDT and apply techniques of behaviour change from the refined
CALO-RE taxonomy (Michie et al., 2011) to support instructors in changing their behaviour to
reflect the SDT-based communication style. The key communication strategies that the instructors
will be encouraged to increase/decrease and the behaviour change techniques underpinning the
intervention are presented in Tables 1 and 2, respectively.

The intervention will be developed and customised for the group cycling context using
information gathered from the observation of classes, and ongoing consultation and feedback
from six experienced group cycling instructors. The observations and consultations with the
experienced instructors will be used to identify (i) the current communication and motivation
styles adopted by group cycling instructors, (ii) the degree to which existing features of the
group cycling instructional style align or conflict with SDT, and (iii) the potential barriers to
instructors creating more motivationally adaptive environments in group cycling classes. At
the end of the study period, instructors in the control group will also be invited to receive
the education intervention.

Table 1. Motivation/communication strategies.

Category	Motivational strategy
Motivationally adaptive strategies (LARS)	
*L*istening to your participants	(1) Taking time to listen and be responsive to your participants' needs
	(2) Encouraging questions and feedback from your participants about their goals, problems, or preferences
*A*dvising your participants	(3) Giving meaningful and appropriate explanations
	(4) Giving specific and constructive feedback
	(5) Using inclusive language (e.g. "we could try … ")
*R*elating to your participants	(6) Acknowledging the participants' feelings and responding appropriately
	(7) Offering meaningful praise which is unconditional
*S*tructuring your class	(8) Creating opportunities for participants to have input and make decisions about the workout
	(9) Offering choice and variety which are realistic and relevant to your participants' needs
	(10) Finding opportunities to interact with all participants
Motivationally Maladaptive Strategies (PEAS)	
*P*ressuring language	(1) Using commands and directives ("must", "should", and "need you to") or inducing guilt and shame
	(2) Criticising, belittling, devaluing, or dismissing participants
*E*mpty communication	(3) Imposing goals and rules with no explanations, or explanations which are confusing, inappropriate, or pressuring
	(4) Offering no specific feedback/praise, or talking in ways that are motivationally "empty" (e.g. "keep going")
*A*ppearing "cold"	(5) Appearing cold and indifferent to your participants' positive and negative feelings; appearing to talk to a "camera"
	(6) Appearing unresponsive to or discouraging your participants' preferences, opinions, and feedback
	(7) Using "no–pain, no-gain" language
*S*tructuring your class	(8) Offering little variety and/or choices that are not meaningful
	(9) Not mixing with your participants
	(10) Comparing participants against each other or being overly competitive

Table 2.   Behaviour change techniques from the refined CALO-RE taxonomy (Michie et al., 2011) applied in the training programme.

Behaviour change technique	How this technique will be incorporated
Provide information on the consequences of behaviour in general	The workshop content will cover the positive and negative consequences of a motivationally adaptive and maladaptive communication style, respectively
Provide information on the consequences of behaviour tailored to a relevant group	Within the workshops the consequences of a motivationally adaptive and maladaptive communication style for exercisers will be explained
Action planning	Instructors will be given action plan sheets and encouraged to create a detailed plan of how they will put into practice each of the motivation strategies within their cycling class
Barrier identification/problem-solving	Instructors will have the opportunity to think about potential barriers to implementing the strategies. They will also identify ways of overcoming these barriers via group discussions within the workshops and Facebook group, and individually in their self-reflection diaries and/or action plans
Prompt self-monitoring of behaviour	Instructors will be encouraged to keep a self-reflection diary on their instructional style and experiences of becoming more need supportive throughout the intervention
Prompt self-monitoring of behavioural outcome	Instructors will be asked to note in their self-reflections if they notice any influence of their communication style on their class members (e.g. any change in participants' effort, attendance, and/or feedback rates)
Provide feedback on performance	During the workshops the instructors will have the opportunity to put into practice the motivation strategies and receive feedback on their performance from the workshop leaders and fellow instructors
Provide information on where and when to perform the behaviour	Information will be provided on where and when different strategies could be operationalised within a cycling class. The information will be conveyed via the workshops, rich strategy descriptions, and examples of good practice provided in the action plans, Facebook group, and illustrative videos
Provide instruction on how to perform the behaviour	Information will be provided on how the strategies could be performed within a cycling class. The information will be conveyed via the workshops, rich strategy descriptions, and examples of good practice provided in the action plans, Facebook group, and illustrative videos
Model/demonstrate the behaviour	The different motivational communication styles and strategies will be demonstrated via illustrative video clips
Prompt practice	Instructors will be prompted to try and practise implementing the motivational strategies during the workshops and between the intervention sessions
Use of follow-up prompts	Following the workshops, the Facebook group forum will be used to prompt instructors to focus on 3–4 new motivational strategies each week
Plan social support/social change	The instructors will be encouraged to elicit social support from each other and use the Facebook group to share experiences

2.4.1. *Workshops*

The intervention will include three workshops, each lasting three hours. The first workshop will take the format of an interactive seminar and include provision of education and information about SDT and the proposed motivation/communication strategies. The workshop will also include exemplar video clips of instructors demonstrating both adaptive and maladaptive approaches to motivating exercisers, group discussions and activities, brainstorming, and individual planning. The second and third workshops will comprise 1.5 hours of similar classroom activities and 1.5 hours of practical activities in the cycling studio. The classroom time in workshops 2 and 3 will create opportunities for the instructors to reflect on and share their experiences of putting the strategies into practice, and to explore and work together to address any challenges. The practical sessions will provide the instructors with opportunities to put into practice what they have learnt in the classroom in a "real-life" setting. The research team will be available to provide immediate feedback and answer questions during these sessions. Instructors who are unable to attend any of the workshops in person will be offered the opportunity to watch a recording of the missed workshop(s) online.

2.4.2. *Implementation support and resources*

Instructors will be provided with a training pack that will include (i) copies of all of the Power-Point slides and educational materials covered in the workshops, (ii) rich narrative descriptions of each of the recommended motivation/communication strategies (presented in Table 1), (iii) personal action planning sheets, and (iv) self-reflection diaries. The rich narratives will include explanations of exactly what the strategy is, why the strategy might be considered motivationally adaptive/maladaptive, implications for exercisers' motivation, and examples of how these strategies could be operationalised in the group cycling classes. For the motivationally maladaptive strategies, the descriptions will also provide suggestions of adaptive strategies that could be employed in place of the maladaptive strategies.

Instructors will also be invited to join a private Facebook page and discussion forum which will be utilised to provide additional resources (e.g. video clips), information (e.g. further ideas regarding how the strategies could be implemented), support (e.g. responses to questions and difficulties faced by the instructors), and discussion (e.g. between instructors regarding their experiences, and/or with the research team) throughout the intervention period. Additional phone and email support from the research team will also be offered.

The instructors will be encouraged to use the action planning sheets throughout the intervention period to effectively plan and monitor how they will apply the motivationally adaptive strategies and replace motivationally maladaptive strategies within their classes. A suggested timetable will be provided to encourage all instructors to try implementing the same strategies during the same weeks of the intervention. This will enable group discussions on particular strategies within the workshops and via the Facebook group page. Each week, three to four rich descriptions of motivational strategies along with relevant images, videos, or discussion questions will be uploaded to the Facebook page. For example, questions relating to particular strategies such as "What ways have you found to offer choice and variety which are realistic and relevant to your participants' needs?" and "What did you find challenging in relation to implementing the strategy?" will be posted on the forum to encourage discussions.

As part of the implementation strategy, instructors will be encouraged to keep a self-reflection diary. Instructors will be asked to record their thoughts and feelings in relation to the ideas explored in the workshops and reflect upon their experiences of putting their action plans into practice. Instructors will also be given the opportunity in their own time to watch the video of

themselves teaching a class (filmed at the baseline data collection) and to reflect upon their use of motivationally adaptive and maladaptive strategies.

A central feature of the delivery style of the intervention will be the provision of a need-supportive learning experience for the instructors. Thus, interactions between the research team and instructors in person and via the Facebook group will aim to support feelings of autonomy, competence, and relatedness.

2.5. Data collection

Baseline questionnaire data will be collected from the instructors and class members in the intervention and the control group up to one month prior to the start of the intervention period (i.e. Time 1; T1) and re-administered within one month following the end of the intervention period (i.e. Time 2; T2). Each instructor will be filmed delivering their class once during T1 and T2. Interviews will be conducted with instructors and exercise class members from the intervention group four to six weeks following the end of the intervention period. Figure 1 includes an overview of the data collection timetable.

To encourage enrolment and retention, class participants will be entered into a prize draw to win one of two Reebok Prize Packs if they complete the questionnaire at both T1 and T2. Instructors participating in the study will be offered the opportunity to receive free educational training. To record adherence to the intervention, researchers will keep a register of the instructors who attend each workshop in person. Instructors who watch the workshops online will be requested to confirm either via phone or email once they have viewed the workshop recording. Where possible, if participants drop out from the study, researchers will keep a record of their reasons for doing so.

2.5.1. Questionnaire data

Exercise class participants. The primary outcome measures will be change from baseline in class members' perceptions of their instructors' motivational style, including autonomy support (six-item short version of the Health Care Climate Questionnaire (Williams, Grow, Freedman, Ryan, & Deci, 1996), adapted for exercise settings (Edmunds, Ntoumanis, & Duda, 2006)), and structure and involvement (five items each, adapted from Markland & Tobin, 2010). Five items will tap the instructor's controlling behaviours and five items (developed specifically for the present study and group exercise context) will gauge the class members' perceptions of the absence of instructor behaviours that would have the potential to be need supportive. Questionnaire stems will ask exercisers to respond based on their experiences within their cycling classes with the targeted instructor during the past month.

Secondary outcome measures will include changes from baseline in class members' motivation to attend classes (tapped via the 19-item Behavioural Regulation in Exercise Questionnaire-2 (Markland & Tobin, 2004)), basic need satisfaction (13 items; Vlachopoulos, Ntoumanis, & Smith, 2010), and 5 items tapping subjective vitality (Ryan & Frederick, 1997). Intentions to continue participating in the cycling classes will be measured via four items specifically developed for this study (e.g. "I intend to continue attending this particular class"). Four items will also be developed to assess class member engagement (e.g. "I pay attention to what the instructor is saying").

Instructors. Further secondary outcome measures will include changes from baseline in instructors' perceptions of their motivational style. Instructors' perceptions of autonomy support, structure, and involvement, as well as controlling behaviours will be measured using the same scales as those employed for exercisers, but with minor amendments to wording so

that the items are suitable for instructors. Instructors' changes in basic need satisfaction will be assessed using the 14-item basic need satisfaction scale (Chen et al., 2015) and motivation to teach classes will be assessed using the Work Extrinsic and Intrinsic Motivation Scale (Tremblay, Blanchard, Taylor, Pelletier, & Villeneuve, 2009). Instructors' vitality will also be measured using the five-item subjective vitality scale (Ryan & Frederick, 1997).

Following each workshop, instructors will complete a short acceptability questionnaire to assess the extent to which they found each of the workshops useful and enjoyable, whether they feel confident and sufficiently prepared to use the strategies in practice, their intentions to use what they have learnt within each of the workshops, and whether they would recommend the training to colleagues. Items will be framed within Bowen et al.'s (2009) acceptability dimension and Dombrowski et al.'s (2012) intervention ratings. At the end of the training programme, instructors will also complete measures that will be developed by us to assess the extent to which they found the overall training acceptable.

2.5.2. *Observation*

Instructors will be video- and audio-recorded teaching one group cycling class on two occasions, during the T1 and T2 periods. A trained researcher will set up the video camera in a discrete location in the cycling studio and the camera will be angled to record only the instructor and not the class participants. To enable identification of the motivational strategies employed by the instructor during the class, a coding tool will be developed for the purposes of this study. Following training, two coders who are blind to the condition (intervention or control) will code the footage.

2.5.3. *Interviews*

At the end of the intervention period, individual semi-structured interviews will be conducted with a subsample of 10 instructors. Interviews will focus on the feasibility of the training, adherence, and barriers to participation in the intervention and/or implementation of the motivation strategies. In addition, instructors will be asked to share their self-reflection diaries and completed action plans with the research team. Individual interviews with dropouts will also be used to explore the reasons for dropout and acceptability of the intervention. To explore the effects of the intervention on class members' experiences in classes, individual semi-structured interviews will be conducted with a subsample of 15 exercisers.

2.6. *Data analysis*

Descriptive statistical analyses will be used to report on participant recruitment, acceptability of the intervention, and rates of adherence and dropout. Questionnaire and observation data will be analysed using multilevel growth modelling (also known as mixed linear modelling) to examine how within-person changes in instructors' perceptions of their own instructional style predict within-person changes in class members' perceptions of the instructors' instructional style, and class members' basic psychological needs and motivation. A grouping variable will be entered into the model to enable us to compare outcomes between intervention and control groups. Multilevel analysis has several advantages over repeated measures ANOVA as it takes into account the hierarchical nature of the data and can accommodate missing data (Singer & Willet, 2003). Given the theory-grounded nature of the intervention, the analysis will focus not only on identifying if the intervention has any impact on changes in the outcome variables, but also on why it is effective by testing the underlying

tenets of the theory (Moore et al., 2014). Inductive thematic analysis (Braun & Clarke, 2006) will be used to analyse the results of the individual semi-structured interviews with instructors and class members.

2.7. *Ethical issues and dissemination*

The study has been granted ethical approval from the Ethics Board at Curtin University and registered with the Australian New Zealand Clinical Trials Registry (no. ACTRN12615000036516). If modifications to the protocol are needed, formal amendment to the protocol will first be submitted and approval sought from the Ethics Committee. Minor administrative changes to the protocol will be agreed on by all authors and documented in a memorandum. Written informed consent will be required from all participants before taking part in the study. All potential participants (both instructors and their class members) will be given an information letter which will outline what their participation will involve, and state that participation is voluntary and that they are free to withdraw at any time. Although there are no known physical, psychological, economic, or social risks associated with participation, appropriate support (e.g. counselling) will be offered to participants should any unusual discomforts arise. All data collected will remain confidential and will be stored securely in line with the university's data protection guidelines. All paper-based documents and data will be stored in a secure locked cabinet. All electronic data will be stored securely on a password-protected laptop. Documents containing names or personal identifying information will be stored separately from study data and identified only by a numerical code. Only the research team will have access to study data. The findings of the trial will be disseminated through peer-reviewed journals and conference presentations. An open-access version of the study results will be made available through Curtin University's institutional repository. Les Mills International will be provided with a summary of the overall study results. There are no current plans for granting public access to the full protocol, participant-level data set or statistical code.

3. Conclusion

This article describes the rationale for and design of a study to develop, implement, and test an SDT-based communication training intervention with group cycling instructors. It is not only necessary to test whether an intervention produces the desired effects, but also to understand why an intervention is, or is not, feasible, effective, or sustainable. A key strength of the design of the proposed intervention is that it is informed by an established theory (SDT) which provides insight into the reasons why the intervention may or may not work. Furthermore, the current study will employ a range of behaviour change techniques via various media (face-to-face and use of online social networking sites) to support instructors to become more motivationally supportive. Moreover, the outcome measures will employ objective and subjective quantitative assessments to avoid risk of common-method variance.

In sum, the findings of this project will have clear relevance for the fitness industry, fitness professionals, and their clients. If the intervention proves successful, exerciser motivation and adherence can be enhanced, and health can be improved. Further, the findings will provide evidence to inform the development of SDT-based communication training programmes to optimise the promotion of motivation in a range of group exercise settings. Finally, the findings will inform a future RCT to test the effectiveness of the SDT-based communication training on exercisers' motivation, adherence, health, and well-being.

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