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# **GOLDEN MOVES: DEVELOPING A TRANSTHEORETICAL MODEL- BASED SOCIAL MARKETING INTERVENTION IN AN ELDERLY POPULATION.**

## **Abstract**

Social marketing is increasingly being used by public and non-profit organizations to deliver behavior change objectives. Drawing on the example of physical activity for the over 65s, we show how social marketing techniques can deliver a physical activity programme for a priority group that has so far received little attention. In this study, conducted in the United Kingdom, we use a grounded theory approach to understand motivational factors and perceived barriers and to determine the types of messages and message channels that could be used for a potential social marketing-based intervention. We show how the findings of this pilot study can be used to develop such an intervention, and present a modeled intervention, based on the transtheoretical model of behaviour change.

## **Key words**

Social marketing, physical activity, elderly, transtheoretical model

# **GOLDEN MOVES: DEVELOPING A TRANSTHEORETICAL MODEL-BASED SOCIAL MARKETING INTERVENTION IN AN ELDERLY POPULATION**

## **1 Introduction**

In this paper, we show how social marketing can contribute to reducing inactivity among the elderly, a priority issue for many local, national and international policy makers: For example, the European Union declared 2012 the 'European Year of Active Ageing' (Commission of the European Union, 2010). We show how social marketing can add value within the context of delivering public services, especially through augmenting and complementing current initiatives, while helping to deliver outcomes through more targeted and effective means.

The paper is divided as follows: Firstly we briefly review the impact of inactivity on an ageing population, and then conduct a dual-design process for a potential social marketing campaign based on a transtheoretical model of behaviour change (Prochaska et al., 1994). In stage one, we use grounded theory to elicit factors that influence physical activity, and in stage two we co-create, with the participants in the study, a potential social marketing intervention. We conclude the paper by discussing the intervention and how social marketing can be used to deliver effective behaviour change programmes.

## **2 Physical (In)Activity in the Elderly**

While some people are physically active in later life, the majority are not: In England only 17 per cent of men and 13 per cent of women aged 65-74 are considered physically active (Department of Health, 2004). This results in both collective and individual costs, in terms of health care and premature death: Conservative estimates rate lack of physical activity as the underlying cause of an estimated 22 per cent of cases of coronary heart disease (CHD), 16 per cent of colon cancer cases, 15 per cent of diabetes cases, 13 per cent of strokes and 11 per cent of cases of breast cancer as well as between 5 and 8 per cent of premature (under the age of 75) deaths in the UK (World Health Organisation, 2005). In addition, physical activity affects the overall quality of life

in later years: It helps to lower hypertension, decreases the onset and progress of osteoporosis, is beneficial for controlling the symptoms of arthritis and osteoarthritis, promotes psychological well-being, increases brain function, and delays the onset of dementia in old age, amongst others (c.f. Frank, Kerr, Rosenberg, & King, 2010). Based on the WHO's estimates, the NHS spend on CHD, strokes, diabetes and cancer of the breast and colon alone, as a result of physical inactivity, is around £1,773 billion per annum, and is expected to rise significantly over the next decades (World Health Organisation, 2005).

### **3 Barriers Against Targeting Older People**

Although research into physical activity amongst the elderly has expanded in recent years, it is lagging behind similar research relating to younger groups (Schutzer & Graves, 2004), this is surprising given the costs of physical inactivity noted earlier. The identification of barriers towards physical activity among older adults was signaled over a decade ago as an important precursor to the development of interventions (Brawley, Rejeski, & King, 2003).

Examining this lack of research, Conn et al. (2002) speculate that the lack of understanding by researchers and professionals as to what constitutes an effective intervention for this target group, as well as a lack of interest in physical activity among many elderly people themselves, confounded by widely-held false beliefs about desirable activity levels (Crombie et al., 2004). Previous research indicates that different age groups respond differently to social marketing campaigns: For example, Conn et al., (2002) find that younger people respond to more general health messages, while older people respond to specific and detailed recommendations regarding actions to be taken, e.g. specific suggestion about which physical activity to perform. For example, as Strath, Swartz, Parker, Miller and Cieslik (2007) show that specific suggestions for physical activity (such as walking) resulted in disease risk reduction among older adults.

### **4 Methodology**

We conducted a series of four exploratory focus groups, with a total of twenty-four participants aged between 65 and 75, from Essex, England. The participants were recruited with the help of general practitioners (GPs, family physicians). The surgery is located in a middle socio economic

area, i.e. patients come from a predominantly white-collar backgrounds. Patients deemed by their GPs to be physically fit enough to conduct regular physical activity, were considered suitable for inclusion, and the GPs invited the participants directly. All of the participants were white, fifteen were female, nine male and the average age was 69. Each focus group lasted between sixty and ninety minutes and was audiotaped and transcribed verbatim. Each participant signed a written informed consent form and received a book voucher to the value of £10 as an incentive to take part. The NHS National Research Ethics Service gave ethical approval for the study.

Each focus group was led by one of the researchers, using semi-structured questions, and was split into two stages. During the first stage, we discussed three topic areas with the participants:

- 1) Current views on, and barriers to, physical activity,
- 2) The role of potential influencers and facilitators, and
- 3) The relevance of current and potential future messages and media channels.

The second stage of each focus group consisted of a discussion about how a social marketing intervention could work in practice. We modeled an intervention, based on the transtheoretical model of behaviour change (TTM) developed by Prochaska and DiClemente (1984), to guide this co-creation process. This is one of several theoretical models that could be used to develop social marketing interventions.

TTM was selected for two reasons: Firstly, it is easily adapted to individually-delivered interventions, rather than focusing on broader societal changes, or social and attitudinal theories, such as the Theory of Reasoned Action and the Theory of Planned Behaviour (Ajzen, 1991). Secondly, it has proved popular with health care providers, who have successfully used TTM-based interventions for a diverse range of issues, including nutrition (Spencer, Wharton, Moyle, & Adams, 2007), smoking (Agyemang et al., 2010), diet (Wilson & Schlam, 2004), sun protection (Weinstock, Rossi, Redding, Maddock, & Cottrill, 2000), sexual health (Brown-Peterside, Redding, Ren, & Koblin, 2000), patient participation (Guadagnoli & Ward, 1998), and physical activity (Hutchison, Breckon, & Johnston, 2009). We acknowledge that TTM focuses on personal

motivation, possibly neglecting external factors, such as culture (Adams & White, 2005) and wider social norms. During the analysis of our data, we therefore kept an open mind as to the emergence of themes related to broader social issues and have highlighted these.

We now discuss the motivational factors, messages and relevant participant insights from the focus groups, before describing the co-created model for a possible intervention.

## **5 Results from the First Stage of the Focus Groups**

After each focus group, we analysed the results using the two-stage process proposed by Powell and Single (1996). Firstly, the data were transcribed. Secondly, emerging themes were identified using a grounded theory approach. The research team then identified relevant variables that offered insights relevant to the development of social marketing activities. Through a series of meetings, themes were grouped together and NVivo was used to organize the data.

We present the findings in relation to three topics we identified: Firstly, we discuss the current situation, including themes relating to knowledge of the benefits of exercise, current exercise behaviour and perceived barriers. Secondly, we focus on potential facilitators and the role of social support for physical activity. Thirdly, the relevance of current messages, potential messages and message channels are discussed.

### *5.1 Current Situation*

#### *5.1.1 Knowledge*

Generally, there was a good level of knowledge of the effects of physical activity on younger people, but little knowledge of the effects on elderly people. All participants engaged in some physical activity, there was no consensus about what exercise formally entailed, or what constituted exercise – and how it is delineated from physical activity. This resulted in participants using the terms sometimes interchangeably.

*'I go for a walk almost every day. That keeps me fit. Surely, that is enough to be active.'* (male, 72)

Despite current recommendations that people over the age of 65 participate in moderate-intensity aerobic exercise for thirty minutes, five times a week, or vigorous exercise for twenty minutes, three times a week, in addition to flexibility and strength training (Nelson et al., 2007), many participants felt that their regular activity was sufficient:

*'I don't do regular exercise. I do go to the shops, walk everywhere, do the household (...) just normal things really.'*  
(female, 65).

*'I go to yoga classes once a week (...) that's more than enough to keep me active!'* (female, 68).

Most people had some idea of practical steps they could take to increase their physical activity, although given their vague understanding of what constituted physical activity and what were the recommended levels of physical activity (and formal exercise), this knowledge was not acted upon.

*'I walk. I'm active. I could walk more maybe. (...)What is classed as exercise?'* (male, 68)

### 5.1.2 Current physical activity levels

Because of the qualitative nature of this study, we cannot quantify the distribution of elderly people among the various stages of change. However, the discussions indicated that most people saw themselves and other people they knew as falling within the pre-contemplation stage, or, for a very small proportion, in the maintenance stage. While all participants were active to some extent, out of all twenty-four participants, only one respondent felt he fully met the guidelines. The respondents frequently justified this by rationalizing that being active in later life was a result of ongoing activity throughout a person's life:

*'He [the husband] has always been like that. For him doing exercise isn't something new or something he has just started. [...] He used to run regularly when he was younger.'*  
(female, 69).

### 5.1.3 Barriers to exercise

A lack of facilities, a lack of time, perceived negative health consequences and beliefs about health and (to a lesser extent) pre-existing conditions, for example pain, fear of injury and embarrassment, were all discussed as barriers preventing the participants from engaging in regular exercise. Importantly, the physical aspects of exercising (e.g. being out of breath, muscle soreness) were themselves perceived to be negative consequences of exercise, rather than indicators of effective exercise.

*'I can't see how that [muscle pain] can be good for me. No. I don't think it would be good.'*

*(male, 72)*

*'When I'm out of breath then I stop (...) Being breathless tells me that I need to go slower.'*

*(female, 70)*

A distinct set of barriers related to the physical environment also emerged, especially in connection with safety fears when exercising in public spaces or walking to and from fitness facilities. Further, a lack of these facilities (or knowledge about such facilities) emerged as a perceived barrier.

*'I didn't know they had yoga classes. I'd be interested in doing that once in a while.'* (female, 71)

*'I've seen something about these classes at the hospital. I think there was a poster or something.*

*But I didn't really pay much attention.'* (male, 65)

## 5.2 Facilitators and Social Support for Exercise

The importance of social support was also discussed: A perceived lack of social support from family and friends in relation to regular exercise was a factor in giving up or not beginning to exercise in the first place.

*'We all used to play [tennis] together, but that sort of fizzled out. (...) Not sure if we could get it going again. I think it would be hard.'* (female, 68)

*'I think if I would start to really exercise my family would think I'm crazy. (...) I still can't quite believe the recommendation is for 30 minutes every day.'* (male, 66)



For those participants who engaged in some form of formal exercise, existing social support amongst their family and friends was a key factor in their maintaining a regular exercise programme. This was often linked to ongoing encouragement, sometimes over a long period:

*'I've always enjoyed sports. My friends have always enjoyed sports. And we still go to yoga together.'* (female, 68)

*'We've just kept it up [playing tennis]. It must be some thirty years now or so.'* (female, 66)

There was some evidence that exercise classes targeted specifically at an elderly audience were seen as negative, however, despite being a way to meet new friends. This negative attitude was a reaction to the perceived 'old people' image. Thus, participation in such classes depended on whether their friends joined as well but overall there was strong apathy towards classes overtly aimed at the elderly. In other words, word-of-mouth and personal encouragement emerged as the most important factors in participation.

*'Oh no. I would never think of joining [a class for elderly]. I just don't class myself as old'*  
(female, 66)

Medical professionals emerged as a frequently contradictory source of social support during the discussions. Participants who maintained a regular exercise regime were not sure if their GPs would approve of their existing regime, let alone suggest they start a new one. This, in turn, conflicted with the support and often admiration received from families and friends, and their desire to maintain that type of support:

*'I don't speak to my GP about exercise. He will tell me to take it easy or even stop (...) Stopping would be a real disappointment for my friends.'*  
(male, 68)

Those who did not maintain a regular exercise regime, felt that positive and proactive encouragement from a health care provider could make them consider taking up regular exercise, which is consistent with the findings in the literature (Burton, Shapiro, & German, 1999) and highlights the potentially pivotal role health care professionals can play during the precontemplation phase.

*'I would like more help on what is ok. Not that I would really ask [my doctor during a routine visit] (...) Mostly he [the doctor] seems to suggest that I take it easier at my age though.'*  
*(female, 70)*

While participants agreed that they would prefer their GP to initiate the discussion, some felt discussing exercise with a nurse or other health care worker might be more suitable because of the time pressures on doctors. However, overall, a strong preference for 'grass-roots', word-of-mouth social support emerged, especially if it made use of careful branding or targeting that emphasized 'keeping young' or 'keeping active', while avoiding a perceived 'old people' image.

### 5.3 Messages and Channels

#### 5.3.1 Relevance of current messages

None of the participants, irrespective of whether or not they were already exercising, felt that existing exercise-related messages were relevant to them. They agreed that current messages are aimed at young and middle-aged audiences. In fact, most participants took the view that the current messages discouraged them from exercising.

*'It's all about young people, really. I'm not saying I'm old. But, you know, at my age, I know what I can do.'* (female, 69).

There was some awareness of more specifically-targeted interventions, but the participants found them patronizing, which echoed the overall perspective that they did not feel 'old':

*'60 is the new 40 (...). All they (health educators) see is an old person. But I'm not.'*  
*(female, 65)*

The health benefits of physical activity in later life seemed to be particularly poorly communicated. The feeling was that the general focus on the cosmetic benefits of exercise (e.g. a better body) was not a motivating factor for them, and that, conversely to the general population, health benefits, particularly when framed in terms such as 'keeping active' or 'keeping young', may be a more important motivational factor for this particular target group.

*'If it keeps me young then I'd consider it. It's important to keep active (...) physically maybe, too.'*  
(female, 69).

### 5.3.2 Preferred media channels

General mass media messages, especially advertising, were seen as ineffective, and most participants described their attitude towards advertising as cynical, based on the common perception that the existing campaigns were patronizing. However, non-advertising channels, especially radio programmes and television serials, were mentioned as potential media channels for raising awareness. For example, participants commented that currently no characters of an advanced age, in popular programmes, such as the Archers, were physically active, which could act as a role model. Further, several participants stated that they gained health-related information when it was part of the plot in fictional serials.

*'I listen to radio a lot. (...) There is a lot of information on the radio about staying healthy. (...) It definitely catches my attention when it's on.'*  
(female, 65)

Overall, however, personal messages were the preferred option. It was felt that introducing the topic during routine appointments might be a good way of raising awareness and directly challenging current perceptions about physical activity. The participants felt such interventions could also include personalized 'nudging', although there was some debate about the form such 'nudging' could take, that is whether it would be best in the form of regular personal contact, or could also be done without personal contact (e.g. technology-based monitoring). From the discussion there emerged a potential link between this and self-efficacy, where low self-efficacy (and low physical activity) was associated with a stronger need for personal contact and guidance, while stronger self-efficacy was associated with a preference for a less personal, more on-demand type of support.

*'I'd want to have someone who knows more [about exercise] to speak to. I wouldn't just do it on my own.'* (female, 75)

*'Not sure if I'd want someone to check up on me. Maybe a friend. But not anybody official.'*

*(male, 67)*

For participants who were already physically active, personal contact was unattractive. Though there was an acknowledgement that outside monitoring could be a good way to increase activity, some felt that proactive goal setting would be counterproductive. Instead, the general consensus was that impersonal support, especially in the form of more positive support messages, emphasizing the health and social benefits of physical activity, and positive social support were more important. Having a personal contact to 'fall back upon' was seen as positive, though not essential.

#### *5.4 Summary of Stage One of the Focus Groups*

The commonly held belief that if a person has been active in their younger years, physical activity is not longer important in later life is, although wide spread not true (Taylor, Blair, Cummings, Wun, & Malina, 1999). The focus groups indicate that this belief served as an excuse for not starting exercise, resulting in a reduction in self-efficacy (*'I couldn't possibly start now'*) as well as decisional balance (*'I would have to learn it first'* and *'it would be embarrassing'*). This underlined the commonly-held, but erroneous, belief that beginning exercise in later life has little benefit (or even a negative effect) (Burbank, Reibe, Padula, & Nigg, 2002).

While advertising and general mass communication was largely dismissed as ineffective, positive role models and the portrayal of active elderly people engaging in physical activity appear potentially effective. Media channels, together with proactive social support, including a positive attitude from health care providers, emerged as the most promising ways to change attitudes towards physical activity. The negative perception of the symptoms of physical activity also appears to be a particularly important issue that needs to be addressed.

For people in the maintenance stage, the role of social support, including positive support from their health care providers, was an important factor.

The preferred message frames suggest that different key messages than are traditionally used for many social marketing campaigns need to be applied in this case, with the emphasis being on health factors/keeping young, especially for the pre-contemplation group.

## 6 POTENTIAL INTERVENTION MODEL

As part of the second stage of the focus groups, participants were asked what they would like to be done to encourage physical activity. At the beginning of this stage, the moderator briefly introduced the TTM by showing the model in Figure 1 and discussing how it was assumed to work and answering related questions. A first hypothetical programme, based on the TTM steps, and developed by the researchers, was presented to the first of the groups, with the researchers making modifications based on each group's feedback before presenting it to the following group. Each successive group refined the programme. We now briefly describe the TTM before presenting the final intervention model.

### 6.1 *Transtheoretical Model of Behaviour Change*

A team of psychologists developed TTM in the late 1970s (Prochaska & Norcross, 1979) and further developed in the early 1980s (Prochaska & DiClemente, 1984; Prochaska & DiClemente, 1982, 1983). A schematic outline of the model is given in Figure 1. The model divides behaviour change into five distinct stages: pre-contemplation, contemplation, preparation, action, and maintenance.

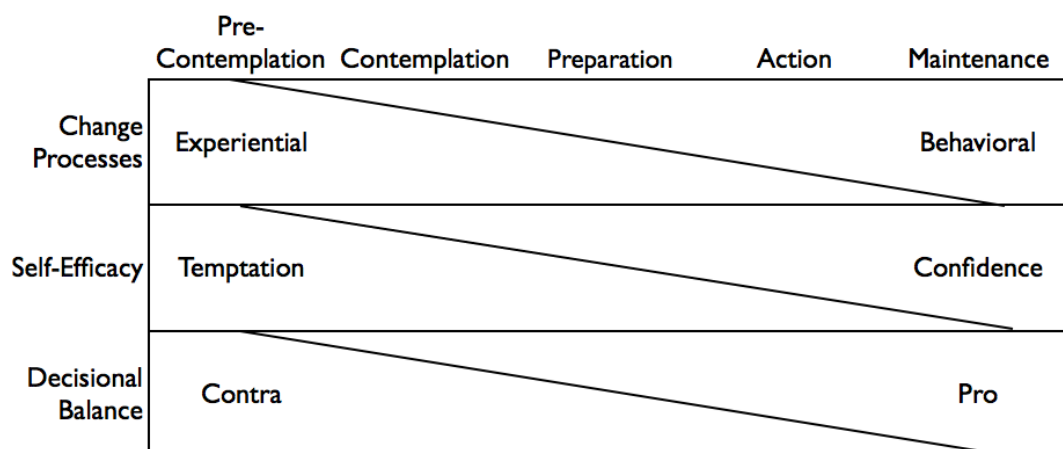


Figure 1: TTA

Each stage represents a person's motivational readiness, ordered along a continuum of time. Pre-contemplation is a stage in which the person has no or little awareness of the issues. This stage is followed by contemplation, where awareness is raised, and the various experiential processes of change begin to be activated. Change is usually anticipated within six months of reaching this stage. Around thirty days before taking action, the person passes into the preparation stage. 'Taking action' and becoming accustomed to the new behaviour follow (action stage). After approximately six months in the action stage, the individual moves into the maintenance stage, in which the behaviour is well-established.

Facilitating the change process are ten 'processes of change': five experiential processes, largely cognitive in nature, and associated with the period before action is taken and five behavioural processes, which facilitate the maintenance of the desired behaviour. During the action stage, the 'processes of change' transform from an experiential, most prevalent during the early stages, to a behavioural focus, more prevalent in the latter stages.

Progress through these stages is further influenced by two intervening variables: decisional balance and self-efficacy/temptation. Decisional balance equates to a 'balance sheet' of comparative potential gains and losses for the individual when they adopt a new behaviour. Self-efficacy (Bandura, 1997) measures a person's perceived ability to complete a task (e.g. a new behaviour) and also acts as a moderator of performance in future tasks. While there are direct measures for tracking a person's progress through the stages, decisional balance and self-efficacy have been proposed as easily applied, indirect outcome measures for estimating this progress (Cardinal, 1997), although there is some debate about the causality, that is whether increases in self-efficacy cause stage progression or are a result of progression (Burbank et al., 2002).

## 6.2 *Final Intervention Model*

The final intervention model, taking into account the feedback from the four focus groups, is presented in Table 1.

**Table 1: Potential intervention model**

<b>Stage</b>	<b>Intervention</b>	<b>Processes</b>
Precontemplation	<p>'Product placement' in relevant media channels (e.g. radio serials, shows, etc.).</p> <p>Health care professionals systematically, and positively highlight the issue during routine visits, supporting this with appropriate literature emphasizing the health benefits, with personal recommendations by the health professionals.</p> <p>Flag a follow-up during the next visit.</p>	Conscious raising
Contemplation	<p>During the next visit, revisit the positive health effects and evaluate stage change.</p> <p>If positive stage change, offer practical solutions. Health advisor/nurse to act as contact point.</p> <p>If negative change, reiterate health benefits and offer help in the form of health trainers/nurses, with a follow-up flagged for the next visit.</p>	<p>Environmental</p> <p>Reevaluation</p> <p>Dramatic relief</p> <p>Social liberation</p>
Preparation	<p>Visit to (or by?) a health trainer/nurse to work out a personalized fitness programme, using goal setting theory to establish key points and including step-by-step checking of potential barriers.</p> <p>Pre-action stage health check to obtain baseline data to encourage action stage</p>	<p>Environmental</p> <p>Reevaluation</p> <p>Dramatic relief</p> <p>Social Liberation</p> <p>Self-reevaluation</p>

	comparisons.	Helping Relationship
Action	<p>Personal or telephone follow-up to ensure positive messages are not getting lost.</p> <p>Health check to demonstrate the outcomes (e.g. lab tests, etc.) and to show deliverables to participants and reinforce positive change.</p>	<p>Reinforcement</p> <p>Management</p> <p>Counterconditioning</p> <p>Helping relationship</p> <p>Stimulus control</p>
Maintenance	Regular, routine health checks, informally, with comparisons to previous checks and/or average indicators for age group.	<p>Helping relationship</p> <p>Stimulus control</p>

The designed intervention focuses on the cognitive processes of change in the first, pre-contemplation stage, by engaging health care providers. Ideally, personal interventions made in stage 1 should be supported by media messages embedded in relevant programmes (e.g. radio serials, soaps and shows) to create positive role models of elderly people engaging in physical activity. During the subsequent pre-action stages, more cognitive processes are used to increase the participant's readiness to start a physical activity programme. During this time, approximately six to seven months in duration according to the model, although somewhat shorter in the view of the participants, no action is taken. The focus is on creating a more positive decisional balance by increasing the individual's knowledge of the positive effects of exercise, as well as providing them with practical steps they can take when starting on a programme. The emphasis then slowly moves from providing information and general positive messaging, during the contemplation stage, to setting concrete goals in the preparation stage. Once the participants have started an exercise programme, there is a balance between demonstrating positive outcomes, reinforcing positive behaviour and general coaching to encourage both self-efficacy and decisional balance. Ongoing goal setting is also a part of this phase. Once the behaviour has been adopted (e.g. after a few months), the emphasis switches towards a more informal approach of demonstrating positive outcomes and providing 'light-touch' encouragement. During



both of the action phases, having an informal information channel was seen as an important means of asking questions or obtaining information. Having such a point of contact and associated social support was generally seen as worthwhile, though it would not necessarily need to be in the form of constant personal contact. In fact, there was some support for telemonitoring, supplemented by online self-help and assisted peer-support, from those with access to online resources.

## **7 SUMMARY AND DISCUSSION**

In this paper we show, using the example of reducing inactivity in the elderly, how social marketing can be used to add value to the delivery of public services, by engaging the community, co-creating and designing possible interventions, and potentially delivering social change and meeting policy objectives.

A key aspect of any (social) marketing campaign is gaining insights into the motivational factors behind adopting a desired behaviour. We have shown that people over the age of 65 represent a group that is distinct from the 'general population' due to misconceptions about physical activity and the common perception that symptoms of effective physical activity are negative (or unhealthy). While general media channels can be used to create positive role models, in terms of messaging channels and credibility, this target group attaches a lot of value to medical professionals taking the lead, in other words health care providers have a crucial role to play as gatekeepers. This is different to the case for many younger target groups, who often actively ignore advice from health professionals. Emphasizing health professionals' key role, and co-operating with them, is therefore highly important when designing a social marketing campaign aimed at this target group. While co-operation is not an easy task, especially given the time constraints that many health professionals work under, it may be a cost-effective intervention option, given the potential benefits of physical activity.

The model we present is a one-to-one intervention using TTM delivered in a health care setting. While this has the potential to deliver successful outcomes, the first stage of our research showed that there are widely-held misconceptions at a societal level, which would not be immediately addressed by the model. In other words, while TTM is useful in designing highly

successful one-to-one interventions, other theoretical models, with broader, attitudinal and belief-based constructs would ideally complement a TTM-derived intervention, driving behaviour and attitude change at the societal level.

The limitations of this study include a reliance on qualitative data, especially gained from focus groups, during which participants may be unwilling or unable to openly discuss all of the factors influencing their behaviour. Further, as the focus groups were conducted within a specific area, the participants largely reflected the demographics of this area, including a predominantly middle-class background. The participants may therefore not be representative of other areas of the UK; in particular variations in ethnicity and social class, including from different socio-economic backgrounds, should be considered.

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#### **REFERENCES**

- Adams, J., & White, M. (2005). Why don't stage-based activity promotion interventions work? *Health Education Research*, 20(2), 237.
- Agyemang, C., Stronks, K., Tromp, N., Bhopal, R., Zaninotto, P., Unwin, N., ... Kunst, A. E. (2010). A cross-national comparative study of smoking prevalence and cessation between English and Dutch South Asian and African origin populations: the role of national context. *Nicotine & tobacco research : official journal of the Society for Research on Nicotine and Tobacco*, 12(6), 557–66. doi:10.1093/ntr/ntq044
- Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes*, 50(2), 179–211.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. Worth Publishers.

- Brawley, L. R., Rejeski, W. J., & King, A. C. (2003). Promoting physical activity for older adults: the challenges for changing behavior. *American Journal of Preventive Medicine, 25*(3), 172–183.
- Brown-Peterside, P., Redding, C. A., Ren, L., & Koblin, B. A. (2000). Acceptability of a stage-matched expert system intervention to increase condom use among women at high risk of HIV infection in New York City. *AIDS education and prevention.*
- Burbank, P. M., Reibe, D., Padula, C. A., & Nigg, C. (2002). Exercise and older adults: changing behavior with the transtheoretical model. *Orthopaedic nursing, 21*(4), 51.
- Burton, L. C., Shapiro, S., & German, P. S. (1999). Determinants of Physical Activity Initiation and Maintenance among Community-Dwelling Older Persons. *Preventive Medicine, 29*(5), 422–430.
- Cardinal, B. J. (1997). Construct validity of stages of change for exercise behavior. *American Journal of Health Promotion, 12*(1), 68–74.
- Commission of the European Union. (2010, September 7). 2012 to be the European Year for Active Ageing. Retrieved 31 May 2011, from <http://ec.europa.eu/social/main.jsp?langId=en&catId=89&newsId=860>
- Conn, V. S., Valentine, J. C., & Cooper, H. M. (2002). Interventions to increase physical activity among aging adults: A meta-analysis. *Annals of behavioral medicine, 24*(3), 190–200.
- Crombie, I. K., Irvine, L., Williams, B., McGinnis, A. R., Slane, P. W., Alder, E. M., & McMurdo, M. E. T. (2004). Why older people do not participate in leisure time physical activity: a survey of activity levels, beliefs and deterrents. *Age and ageing, 33*(3), 287.

- Department of Health. (2004). *At least five a week: Evidence on the impact of physical activity and its relationship to health*. London: Department of Health.
- Frank, L., Kerr, J., Rosenberg, D., & King, A. (2010). Healthy aging and where you live: community design relationships with physical activity and body weight in older Americans. *Journal of Physical Activity & Health*, 7(1), S82.
- Guadagnoli, E., & Ward, P. (1998). Patient participation in decision-making. *Social Science & Medicine*, 47(3), 329–339.
- Hutchison, A. J., Breckon, J. D., & Johnston, L. H. (2009). Physical activity behavior change interventions based on the transtheoretical model: A systematic review. *Health Education & Behavior*, 36(5), 829.
- Nelson, M. E., Rejeski, W. J., Blair, S. N., Duncan, P. W., Judge, J. O., King, A. C., ... Castaneda-Sceppa, C. (2007). Physical activity and public health in older adults. Recommendation from the American College of Sports Medicine and the American Heart Association. *Circulation*, CIRCULATIONAHA.107.185650.
- Powell, R. A., & Single, H. M. (1996). Focus Groups. *International Journal for Quality in Health Care*, 8(5), 499.
- Prochaska, James O, & Norcross, J. C. (1979). *Systems of psychotherapy: A transtheoretical analysis*. Brooks/Cole Publishing Company.
- Prochaska, James O, & DiClemente, C. C. (1982). Transtheoretical therapy: Toward a more integrative model of change. *Psychotherapy: Theory, Research & Practice*, 19(3), 276.

- Prochaska, James O, & DiClemente, C. C. (1983). Stages and processes of self-change of smoking: toward an integrative model of change. *Journal of consulting and clinical psychology, 51*(3), 390.
- Prochaska, J. O., & DiClemente, R. J. (1984). *The transtheoretical approach: Crossing the traditional boundaries of therapy*. Homewood: Dow Jones Irwin.
- Prochaska, J. O., Velicer, W. F., Rossi, J. S., Goldstein, M. G., Marcus, B. H., Rakowski, W., ... Rosenbloom, D. (1994). Stages of change and decisional balance for 12 problem behaviors. *Health Psychology, 13*, 39.
- Schutzer, K. A., & Graves, B. S. (2004). Barriers and motivations to exercise in older adults. *Preventive Medicine, 39*(5), 1056–1061.
- Strath, S., Swartz, A., Parker, S., Miller, N., & Cieslik, L. (2007). Walking and metabolic syndrome in older adults. *Journal of Physical Activity & Health, 4*(4), 397.
- Spencer, L., Wharton, C., Moyle, S., & Adams, T. (2007). The transtheoretical model as applied to dietary behaviour and outcomes. *Nutrition research reviews, 20*(01), 46–73.
- Taylor, W. C., Blair, S. N., Cummings, S. S., Wun, C. C., & Malina, R. M. (1999). Childhood and adolescent physical activity patterns and adult physical activity. *Medicine & science in sports & exercise, 31*(1), 118.
- Weinstock, M. A., Rossi, J. S., Redding, J. A., Maddock, J. E., & Cottrill, S. D. (2000). Sun protection behaviors and stages of change for the primary prevention of skin cancers among beachgoers in southeastern New England. *Annals of Behavioral Medicine, 22*(4), 286–293.

Wilson, G. T., & Schlam, T. R. (2004). The transtheoretical model and motivational interviewing in the treatment of eating and weight disorders. *Clinical Psychology Review, 24*(3), 361–378.

World Health Organisation. (2005). *Preventing chronic diseases: a vital investment*. Geneva: WHO.