Appendix 1.1 Key Phases and Use of Theory from Five Approaches to Developing and Implementing Behavior Change Interventions (Adapted from Presseau et al., 2019)

	Intervention Mapping (Bartholomew Eldredge et al., 2016)	Behavior Change Wheel (Michie, van Straalen, & West, 2011)	Application of the Theoretical Domains Framework (French et al., 2012)	Experimental Medicine (Sheeran et al., 2017)	Mapping Change Mechanisms Approach (Abraham, 2012)
Key phases	Step 1: Develop logic model of the problem Step 2: Identify program outcomes and objectives – Develop logic model of change Step 3: Intervention program design Step 4: Intervention program production Step 5: Intervention program implementation plan Step 6: Intervention evaluation plan	Stage 1: Understanding the behavior • Step 1: Define the problem in behavioral terms • Step 2: Select target behavior • Step 3: Specify the target behavior • Step 4: Identify what needs to change Stage 2: Identifying intervention options • Step 5: Identify intervention functions • Step 6: Identify policy categories Stage 3: Identifying content and implementation options • Step 7: Identify behavior change techniques • Step 8: Identify modes of delivery	Step 1: Identify who needs to do what differently Step 2: Identify barriers and enablers using a theoretical framework Step 3: Identify behavior change techniques and modes of delivery best suited to address identified barriers and enablers Step 4: Select measures of behavior and mediators/ moderators of change	Step 0: *Specify* the primary outcome of interest – a single behavior or an outcome resulting from the behavior Step 1: *Identify* the potentially modifiable factors related to outcome identified in Step 0 – basis for the "mechanism of action" Step 2: *Validate* that change in the target factor identified in Step 1 coincides with change in the outcome of interest identified in Step 0 Step 3. Test how selected intervention strategies *engage* the identified target factor and select a strategy efficacious in eliciting change in the target factor Step 4: Conduct a *full test* of the model to determine that the intervention strategy elicits a change in the outcome of interest, through change in the specified target	Step 1: Identify the problem that necessitates (behavioral) intervention Step 2: Plan elicitation research based on "needs assessment" from intervention mapping identifying antecedents/determinants and change processes Step 3: Link antecedents/determinants and change processes identified in elicitation research with behavior change techniques Step 4: Incorporate behavior change techniques into intervention materials Step 5: Plan intervention evaluation alongside intervention planning
Theory/ approaches used	Whole theories used and combined by applying "core processes"	Summarized groups of constructs used, e.g. capability, opportunity, motivation, behavior (COM-B) model and theoretical domains framework	Theories or groups of constructs from theoretical domains framework (Michie & West, 2013)	Experimental medicine approach (Nielsen et al., 2018; Sheeran et al., 2017)	Information-motivation-behavioral skills model (Fisher & Fisher, 1992); Intervention mapping (Bartholomew Eldredge et al., 2016)

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Appendix 1.2 Handbook Chapters and Thematic Companion Chapters

Chapter	Companion chapter(s)		
	Part I	Part II	Part III
Part I			
2 Changing Behavior Using the Theory of Planned Behavior	3, 4, 7, 15	19, 20	31, 32, 33, 34
3 Changing Behavior Using Social Cognitive Theory	2, 3, 7, 15	19, 20	31, 32, 33, 34
4 Changing behavior Using the Health Belief Model and Protection Motivation Theory	2, 3	19, 20	31, 32, 33, 34
5 Changing Behavior Using the Common-Sense Model of Self-Regulation	3	19, 20	
6 Changing Behavior Using the Model of Action Phases	7, 15	19, 20	39
7 Changing Behavior Using the Health Action Process Approach	6	19, 20	31, 32, 39
8 Changing Behavior Using Self-Determination Theory	15	19, 20	35, 36, 45
9 Changing Behavior Using Control Theory		19, 20	
10 Changing Behavior Using the Transtheoretical Model		19, 20	45
11 Changing Behavior Using Integrated Self-Control Theory	15	19, 20	37, 40
12 Changing Behavior Using the Reflective-Impulsive Model	7, 15	19, 20	34
13 Changing Behavior Using Habit Theory	7, 15	19, 20	41
14 Changing Behavior by Changing Environments	12	19–24, 27–30	36, 42
15 Changing Behavior Using Integrated Theories	11, 12, 14	19, 20	31, 34, 35, 41, 39, 32
16 Changing Behavior Using Social Identity Processes	18	19, 20	43, 44
17 Changing Behavior Using Ecological Models	18	19, 20, 28	
18 Changing Behavior Using Theories at the Interpersonal, Organizational, Community, and Societal Levels	16, 17	19, 20	
Part II			
19 Design, Implementation, and Evaluation of Behavior Change Interventions: A Ten-Task Guide	*		*
20 Moving from Theoretical Principles to Intervention Strategies: An Experimental Medicine Approach	*		*
21 Developing Behavior Change Interventions			*
22 Evaluation of Behavior Change Interventions			*
23 Implementation Science and Translation in Behavior Change			*
24 Engagement of Stakeholders in the Design, Evaluation, and Implementation of Complex Interventions		21, 22, 23	*
25 Maximizing User Engagement with Behavior Change Interventions		21, 22, 23	*

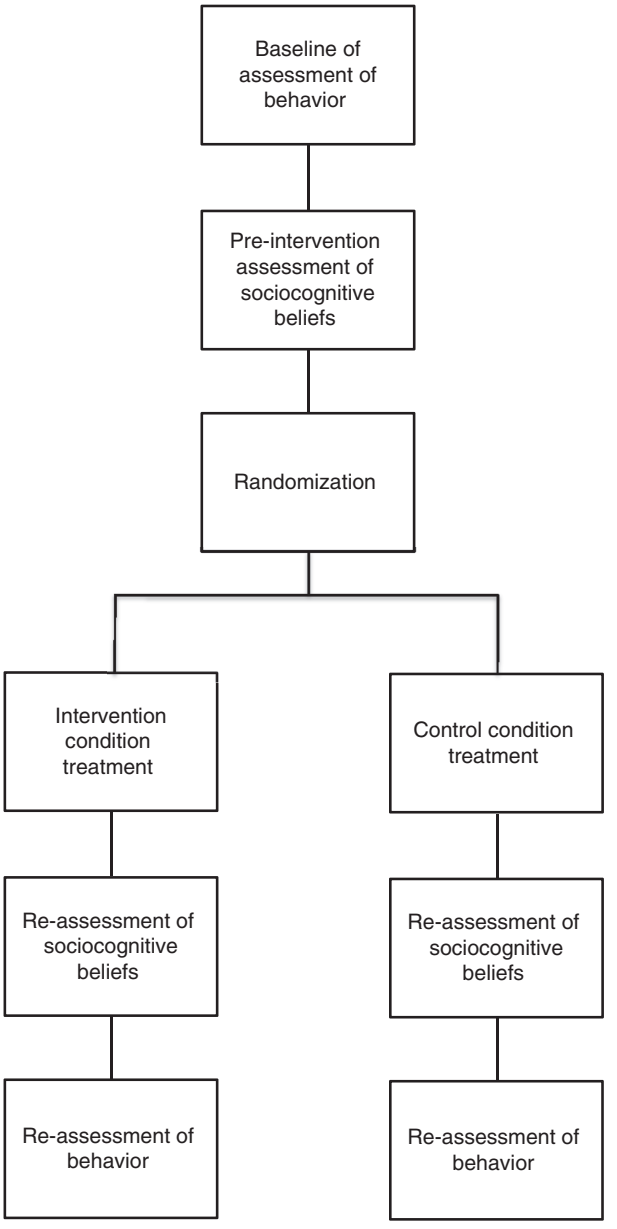
Continued

Cont.

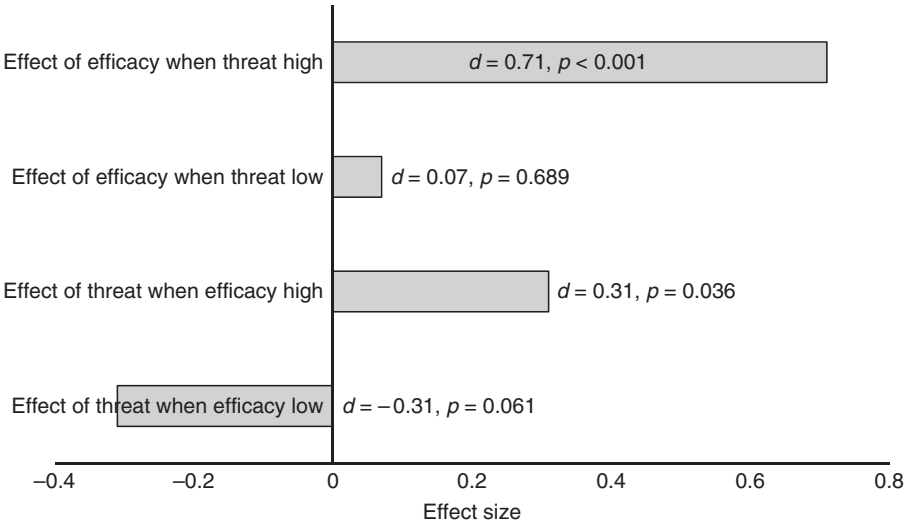
Chapter	Companion chapter(s)		
	Part I	Part II	Part III
26 Cost-Effectiveness Evaluations of Behavior Change Interventions		21, 22, 23	*
27 Addressing Underserved Populations and Disparities in Behavior Change	*	*	*
28 Behavior Change in Community Contexts	18		*
29 Changing Behavior in the Digital Age	*	*	*
30 Critical and Qualitative Approaches to Behavior Change	*	*	*
Part III			
31 Attitudes and Persuasive Communication Interventions	2, 3, 4	19–25, 27–30	34, 32, 37
32 Self-Efficacy Interventions	2, 3, 4	19–25, 27–30	31
33 Imagery, Visualization, and Mental Simulation Interventions	2, 3, 4	19–25, 27–30	31, 32, 39
34 Affect-Based Interventions	2, 3, 4, 12	19–25, 27–30	31, 37
35 Autonomy-Supportive Interventions	8	19–25, 27–30	45
36 Incentive-Based Interventions	8, 14	19–25, 27–30	41, 42
37 Monitoring Interventions	2, 3, 4, 11	19–25, 27–30	31, 34
38 Goal Setting Interventions	6, 8	19–25, 27–30	39
39 Planning and Implementation Intention Interventions	6, 7	19–25, 27–30	38
40 Self-Control Interventions	11	19–25, 27–30	42
41 Habit Interventions	13, 15	19–25, 27–30	36
42 Economic and Behavioral Economic Approaches to Behavior Change	14	19–25, 27–30	36
43 Dyadic Behavior Change Interventions	16	19–25, 27–30	44
44 Social Identity Interventions	16	19–25, 27–30	43
45 Motivational Interviewing Interventions	8, 10	19–25, 27–30	35

Note. * = These chapters present broad approaches and methods that are relevant to most of the chapters in the designated section of the handbook.

Appendix 4.1 Intervention Design to Change Beliefs



Appendix 4.2 Interactive Effects of Threat and Efficacy Manipulations on Behavior Change Based on Peters, Ruiter, and Kok (2013), Effect Size Estimates Displayed as Standardized Mean Difference (Cohen's *d*)



Reference

Peters, G.–J. Y., Ruiter, R. A. C., &Kok, G. (2013). Threatening communication: A critical re-analysis and a revised meta-analytic test of fear appeal theory *Health Psychology Review 7*, S8–S31. https://doi.org/10.1080/17437199.2012.703527

Appendix 5.1 Harnessing Graphics Technologies to Motivate Risk-Reduction Behaviors

People who are at risk for illnesses often lack motivation to take risk-reducing action, due in part to the lack of a concrete, coherent understanding of how the protective behaviors alter physiological processes in risk-reducing ways. Heart disease risk exemplifies this issue: People often understand at an abstract, conceptual level that lifestyle behaviors such as diet and exercise affect their risk but they lack a concrete understanding of how these behaviors affect the cardiovascular system. Communications that provide graphic images of these processes can instill concrete images in mental risk representations that are highly accessible to recall over time, foster risk-action link coherence, and elicit worry-related reactions that further motivate risk-reducing efforts.

Advances in graphics technologies provide new opportunities to create image-based communications. For example, the Physiome Project (http://physiomeproject.org/) is developing web-accessible models of anatomical structures, from cells to organ systems, in three-dimensional, moveable forms. These models could be implemented as educational tools in electronic medical records and on health websites. The common-sense model's delineation of concrete-experiential processes in the self-regulation of illness threats makes it a useful framework for incorporating these graphic models to motivate understanding and protective behaviors.

Cardiac models derived from the Physiome Project were used to develop a common-sense model–guided computer program depicting the influence of lifestyle habits on the heart (Lee et al., 2011). In a trial of the program, sedentary adults viewed a three-dimensional heart that was tailored to beat at their current pulse rate and to show early signs of damage. The program then showed how the heart would change over time. First, it showed improvements (e.g., slowed pulse, heart chambers returning to normal size, increased capillary density) if the user were to engage in healthy diet and exercise habits. It then showed changes over time (e.g., faster heart rate, fewer capillaries, and plaque buildup leading to a heart attack) if the user did not engage in these habits. The common-sense model–guided graphics program was more effective than a text-only version and an attention-control program in instilling adaptive risk representations and increasing worry, protection motivations, and healthy diet behavior over the subsequent weeks. Changes in risk representations included increases in coherence, cause, consequences, timeline, and mental images about heart features and protective actions. Although further research is needed to test the longer-term effects of the program, the study underscores the promise of theoretically guided communications that use imaging technology to deliver risk information.

Reference

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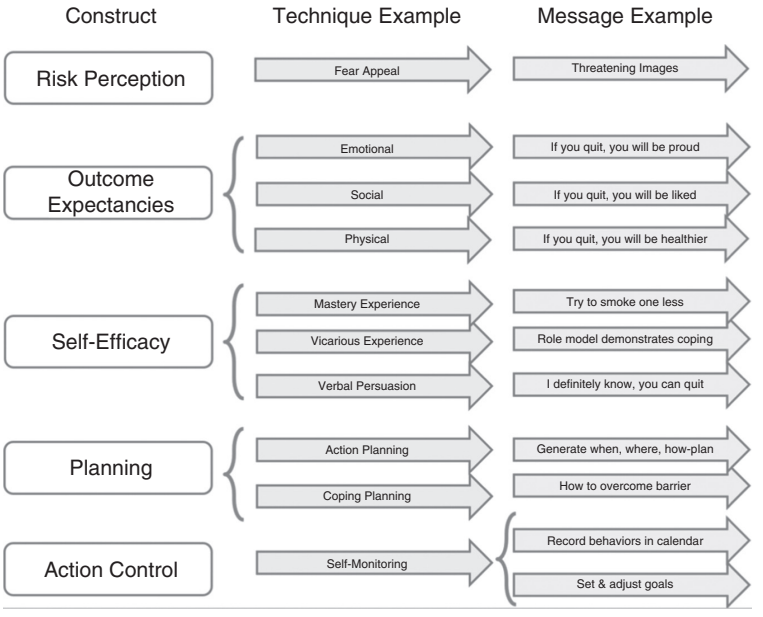
Appendix 7.1 Translation of Constructs into Techniques and Messages in a Top-Down Approach



Appendix 7.2 Behavior Change Methods, Detailed Descriptions, Theoretical Construct Targeted, and Example Content from the *Telegram* Intervention to Change Adolescent Oral Health Behavior (Scheerman et al., 2019)

Behavior Change Method	Description	Target Construct	Example of *Telegram*[a] Intervention Content
BCT 5.1: Providing information on health consequences	Information on oral health behaviors and its link to oral health was provided	Outcome Expectancies	The *Telegram* intervention presented information on good oral health behavior as well as imagery to demonstrate the effect of poor oral hygiene practices
BCT 9.2: Advising to identify reasons for wanting (pros) and not wanting to (cons) change behavior	Adolescents were encouraged to formulate their own potential pros and cons of regular toothbrushing	Outcome Expectancies	Individual schools printed and disseminated forms on which these pros and cons of regular toothbrushing could be formulated
BCT 4.1: Providing instructions on how to perform the behavior BCT 6.1: Demonstrating the behavior, i.e., providing an observable sample of the performance of the behavior (through film) (includes modeling of behavior)	Instructions on and role modeling of effective behaviors	Self-Efficacy	The *Telegram* intervention provided a three-minute video clip demonstrating effective toothbrushing
BCT 16.3: Prompting observation of the consequences for others when they perform the behavior (vicarious reinforcement)		Outcome Expectancies, Social Influences	The *Telegram* channel presented information about peers when they perform good oral health behavior
BCT 1.4: Prompting action planning	Adolescents were asked to make concrete plans on when, where, and after what activity they would brush their teeth in future using the if-then formulation	Action Planning, Intention	Individual schools printed and disseminated forms on which these action plans could be created

Continued

Cont.

Behavior Change Method	Description	Target Construct	Example of *Telegram*[a] Intervention Content
BCT 15.3: Advising to focus on past success	Adolescents were encouraged to focus on their past success regarding toothbrushing	Self-Efficacy	The *Telegram* intervention sent notifications throughout the intervention period helping the adolescents to think about good toothbrushing behavior
BCT 1.2: Problem solving (i.e., prompting the person to analyze factors influencing the behavior and generating strategies and coping plans to overcome barriers	Adolescents were asked to identify barriers and possible solutions by making coping plans, in order to increase adherence to their action plans	Coping Planning	Individual schools printed and disseminated *volitional help sheets* on which these coping plans could be created
BCT 2.3 and 2.4: Prompting self-monitoring of behavior and the outcome of the behavior	Adolescents were asked to monitor their oral hygiene behavior and oral health status	Action Control	Individual schools printed and disseminated forms on which adolescents could enter into a weekly calendar and on which adolescents could monitor their behavior. This was the same form on which the action plans could be created In addition, the *Telegram* platform asked adolescents to monitor their oral hygiene by using disclosing tablets and to take selfies of their teeth
BCT 2.2 and 2.7: Providing feedback on the outcome of behavior	Feedback on oral health behavior change was provided	Outcome-Expectancies, Risk Perceptions	Adolescents were asked to send their selfies of their teeth to an additional channel that was created and owned by the principal researcher. Three research associates compared the weekly photos and provided feedback on progress that had been made in a private conversation with individual adolescents. Feedback included, for example, providing advice on effective oral hygiene behavior techniques, such as appropriate cleaning advice, and/or praise on improvements noted

Continued

Cont.

Behavior Change Method	Description	Target Construct	Example of *Telegram*[a] Intervention Content
BCT 3.1 and BCT 3.2: Arranging general and practical social support (note: this BCT was not included for the adolescent group)	Mothers were asked to encourage their adolescent to complete all intervention activities	Social Influences	In addition to the adolescent group intervention, in the adolescent + mothers group a telegram channel was created for mothers that instructed them to coach and monitor their child's behavior. Mothers were also asked to specifically assist them in creating their individual action and coping plans and to help them accomplish their daily task and if needed to provide social support

Note. [a]*Telegram* is an online social media platform; BCT = behavior change technique; adapted from Michie, S., Richardson, M., Johnston et al. (2013). The behavior change technique taxonomy (v1) of 93 hierarchically clustered techniques: Building an international consensus for the reporting of behavior change interventions. *Annals of Behavioral Medicine*, *46*, 81–95. https://doi.org/10.1007/s12160-013-9486-6.

Appendix 8.1 Autonomy-Supportive and Controlling Behaviors for Schoolteachers Based on Reeve and Jang (2006)

Behavior Displayed by Social Agent	Operational Definition
Autonomy-supportive behaviors	
1. Time listening	Cumulative number of seconds the teacher carefully and fully attended to the student's speech, as evidenced by verbal or nonverbal signals of active, contingent, and responsive information processing.
2. Asking what student wants	Frequency of questions asking specifically about what the student wanted or desired, such as "Which pattern do you want to start with?"
3. Time allowing student to work in own way	Cumulative number of seconds the teacher invited or allowed the student to work independently and to solve the puzzle in their own way.
4. Time student talking	Cumulative number of seconds the student talked.
5. Seating arrangements	Whether or not the teacher invited the student to sit in the chair nearest to the learning materials.
6. Providing rationales	Frequency of explanatory statements as to why a particular course of action might be useful, such as "How about we try the cube, because it is the easiest one."
7. Praise as informational feedback	Frequency of statements to communicate positive effectance feedback about the student's improvement or mastery, such as "Good job" and "That's great."
8. Offering encouragements	Frequency of statements to boost or sustain the student's engagement, such as "Almost," "You're close," and "You can do it."
9. Offering hints	Frequency of suggestions about how to make progress when the student seemed to be stuck, such as "Holding the puzzle in your hands seems to work better than laying it on the table" and "It might be easier to work on the base first."
10. Being responsive to student-generated questions	Frequency of contingent replies to a student-generated comment or question, such as "Yes, you have a good point" and "Yes, right, that was the second one."
11. Communicating perspective-taking statements	Frequency of empathic statements to acknowledge the student's perspective or experience, such as "Yes, this one is difficult" and "I know it is a sort of difficult one."

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Behavior Displayed by Social Agent	Operational Definition
Controlling behaviors	
1. Time teacher talking	Cumulative number of seconds the teacher talked.
2. Time holding/monopolizing learning materials	Cumulative number of seconds the teacher physically held or possessed the puzzle.
3. Exhibiting solutions/ answers	Number of puzzle solutions the teacher physically displayed or exhibited before the student had the opportunity to discover the solution for themselves.
4. Uttering solutions/answers	Frequency of statements revealing a puzzle solution before the student had the opportunity to discover it for themselves, such as "The cube's done this way – like this."
5. Uttering directives/ commands	Frequency of commands such as do, move, put, turn, or place, such as "Do it like this," "Flip it over," or "Put it on its side."
6. Making should/ought to statements	Frequency of statements that the student should, must, has to, got to, or ought to do something, such as "You should keep doing that" and "You ought to . . ."
7. Asking controlling questions	Frequency of directives posed as a question and voiced with the intonation of a question, such as "Can you move it like I showed you?" and "Why don't you go ahead and show me?"
8. Deadline statements	Frequency of statements communicating a shortage of time, such as "A couple of minutes left" and "We only have a few minutes left."
9. Praise as contingent reward	Frequency of verbal approvals of the student or the student's compliance with the teacher's directions, such as "You're smart" or "You are really good at playing with blocks."
10. Criticizing the student	Frequency of verbal disapprovals of the student or the student's lack of compliance with the teacher's directions, such as "No, no, no, you shouldn't do that."

References

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Appendix 8.2 Classification System of Motivational and Behavior Change Techniques Based on Teixeira et al. (2020)

Label	Definition	Function Description
Autonomy-Support Techniques		
MBCT1. Elicit perspectives on condition or behavior	Encourage exploration and sharing of perspectives on current behavior (e.g., causes, perpetuating factors, etc.)	Allows exploration of behavior in more depth (self-knowledge), which can inform the program and personal choices
MBCT2. Prompt identification of sources of pressure for behavior change	Prompt identification of possible sources of external (or partially internalized) pressures and expectations and explore how they may relate to client's desired goals and outcomes	Explores locus of causality and potential sources of external/introjected regulation and its consequences
MBCT 3. Use noncontrolling, informational language	Use informational, nonjudgmental language that conveys freedom of choice, collaboration, and possibility when communicating (avoiding constraining, pressuring, or guilt-inducing language). For example, use "might" or "could" instead of "should" and "must"	Avoids being a source of pressure or creating internal pressure, countering external locus of causality for actions
MBCT 4. Explore life aspirations and values	Prompt identification and listing of important life aspirations, values, and/or long-term interests and explore how changes in behavior (or maintaining the status quo) could be linked to them	Explores integrity and internal coherence between aspirations, values, and goals/behaviors, which can sustain autonomous regulation
MBCT 5. Provide a meaningful rationale	Prompt client to identify rationale for behavior change and its maintenance that is tailored, explanatory, and personally meaningful or valuable	Highlights and reinforces motives/reasons that could form the basis of autonomous motivation
MBCT 6. Provide choice	Provide opportunities to make choices from a collaboratively devised menu of behavioral options and autonomous goals. It includes the decision not to change, delay change, select focus/intensity of change, personally endorsed intrinsic goals and standards for success, including the timing or pace for certain outcomes	Promotes personal input and ownership over behavior change and responsibility through choice

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Label	Definition	Function Description
MBCT 7. Encourage the person to experiment and self-initiate the behavior	Prompt the person to experiment and self-initiate (new) target behavior that could be fun and enjoyable, is experienced as positive challenge, opportunity for learning or personal expression, and/or are associated with skill development, all of which provide experiential/immediate positive reinforcement	Supports autonomous action via intrinsic motivation
Relatedness-support techniques		
MBCT 8. Acknowledge and respect perspectives and feelings	Provide statements of empathy and acknowledgment of the person's perspective, conflicts/ambivalence, distress and negative affect (fear, confusion, etc.), and also expression of positive feelings when communicating with client (concerning the target behavior, treatment, or other related matters)	Indicates attention and respect for the person's attitudes, thoughts perceptions, and feelings, which creates an accepting and warm social environment
MBCT 9. Encourage asking of questions	Prompt the client to pose questions regarding their goals/behavioral progress	Creates an open and collaborative relation that promotes trust
MBCT 10. Show unconditional regard	Express positive support regardless of success or failure	Demonstrates unconditional respect, care, and support and promotes warm social environment
MBCT 11. Demonstrate/ show interest in the person	Provide statements of interest and curiosity about the person's thoughts and perceptions, personal history and background, social context, life events, and so on when communicating	Displays involvement; indicates to the person that their experiences and input are valued
MBCT 12. Use empathic listening	Demonstrate attentiveness to the client's responses (e.g., stay silent to allow the person to complete sentences) and provide reflective and summary statements when appropriate (directed at affect or content) when communicating. Prompt permission to provide new information, guidance or advice	Creates open, collaborative relation; promotes trust; displays respect for the person
MBCT 13. Providing opportunities for ongoing support	Offer the person an appropriate venue and means to contact you in the event of difficulties or questions during the behavior change process	Shows care and personal involvement
MBCT 14. Prompt identification and seek available social support	Prompt identification of sources of support for behavior change (if relevant), acknowledge challenges in recruiting adequate support (autonomous vs controlled), and promote effective ways of seeking positive support	Includes strategies that will help in feeling confident to overcome potential challenges and meet behavioral goal (e.g., information about available programs, active involvement of others such as family members)

Continued

Cont.

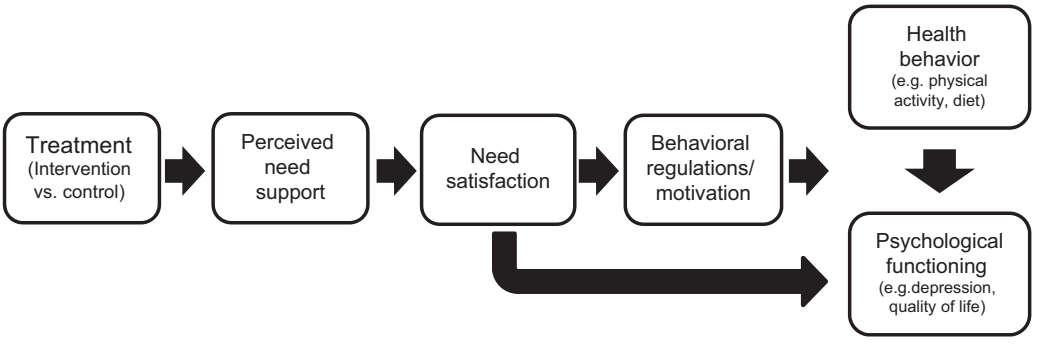
Label	Definition	Function Description
Competence-support techniques		
MBCT 15. Address obstacles for change	Prompt identification of likely barriers to behavior change, based on previous attempts, and explore how to overcome them (e.g., what may have worked in the past)	Increases confidence and reinforces existing skills
MBCT 16. Clarify expectations	Prompt statements of client's own expectations in terms of behavior change (e.g., identify a clear goal or learning objective), both its experiential elements (process) and its outcomes	Provides structure and minimizes future failure (and perceived incompetence)
MBCT 17. Assist in setting optimal challenge	Assist in identification of goals that are realistic, meaningful, challenging, and achievable	Provides structure and minimizes future failure (and perceived incompetence)
MBCT 18. Offer constructive, clear, and relevant feedback	Provide relevant, tailored, nonevaluative feedback on goal/behavioral progress. This can include specific, process-focused feedback	Provides encouragement and information to guide future behavior
MBCT 19. Help develop a clear and concrete plan of action	Develop and provide summary of action plan to work toward a behavioral goal	Provides structure, increases confidence, and minimizes future failure (and perceived incompetence)
MBCT 20. Promote self-monitoring	Prompt monitoring of progress, skill level, or performance such as suggesting options for monitoring tools/means and metrics for success, including steps in the direction of behavior change	Provides structuring information that reinforces success and self-awareness
MBCT 21. Explore ways of dealing with pressure	Provide information to manage and limit effects of pressuring contingencies that would undermine competence such as extrinsic rewards, criticism, negative feedback	Increase confidence to deal with sources of controlling pressure from others and themselves

Note. Reference to "the person" in technique descriptions refers to the individual or group whose behavior is to be changed (e.g., a client, patient, or participant). MBCT = motivation and behavior change technique.

References

Teixeira, P. J., Marques, M. M., Silva, M. N. et al. (2020). Classification of techniques used in self-determination theory-based interventions in health contexts: An expert consensus study. *Motivation Science*. https://doi.org/10.1037/mot0000172

Appendix 8.3 The Self-Determination Theory Process Model for Health Behavior Change in Intervention Research Based on Fortier et al. (2012)



References

Fortier, M. S., Duda, J. L., Guerin, E., & Teixeira, P. J. (2012). Promoting physical activity: Development and testing of self-determination theory-based interventions. *International Journal of Behavioral Nutrition and Physical Activity*, *9*, 20. https://doi.org/10.1186/1479-5868-9-20

Appendix 9.1 Summary of the Range of Reasons for Behavior Change According to Control Theory

Mechanism of Behavior Change	Definition and Examples	Key Evidence for the Mechanism
Unlearned mechanisms	The spontaneous dynamics of a control system	Marken & Mansell (2013) review an array of studies across psychological subdisciplines
Disturbance	Withhold "star stickers" from a child until she completes her homework, so she works harder	
Feedback function	Provide regular opportunities for sales staff to see if they have met their sales targets, so they keep up efforts until they reach them	
Learned mechanisms	Elements of control systems that change over time	Powers (2008) provides computer simulations of control systems in which these parameters can be manipulated and behavior change observed
Perceptual function	Soldier gets better at identifying various enemies	
Reference value (RV)	Successful violinist raises goal to get a Grade 8	
Memory (as RV)	Patient avoids reminders of past embarrassment	
Gain	Surgeon becomes more precise at incisions	
Output function	Lawyer learns a variety of ways to challenge cases	
Conflict	The effects of control systems in conflict	McClelland (2014) models conflict between social groups to show how changes in behavior emerge that match natural observations
Indecisiveness	Perfectionist student delays handing in his essay	
Suppression	Traumatized police officer forces herself to work	
Release of suppression	Depressed actor finds the ideal theatre role	
Overcompensation	Breathing quickly to escape feelings of anxiety brings on more symptoms	

Continued

Cont.

Mechanism of Behavior Change	Definition and Examples	Key Evidence for the Mechanism
Reorganization	Random changes in control systems entail "aimless" behaviors during the attempt to restore control Inpatient in a psychiatric ward under acute stress engages in "unusual behaviors" that disturb other patients A group of advertising executives "brain-storm" ideas for a new campaign	Marken & Carey (2014) review research on reorganization and how it applies to therapeutic change
Awareness	The current focus of awareness influences what goals are pursued and therefore the current behavior President of a developing country spends an hour a day talking with his aides about his priorities	Higginson & Mansell (2016) review evidence for how shifting and sustaining awareness is a key mechanism across therapies

References

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Appendix 9.2 Do It Yourself! How to Practice Method of Levels Therapy

Method of levels (MOL) was initially developed by Powers during the 1950s and 1960s while he was developing his ideas on control theory. He used it to introspect on the levels within his perceptual hierarchy. Since the 1990s, it has been used as a mental health intervention but, in essence, it is simply a way of talking to a person to help them resolve their own conflicts (see Chapter 45, this volume).

The first goal of the MOL questioner is to "ask about the problem." The second goal is to "ask about disruptions." The therapist's job is to listen and observe intently to the client and follow one of these two goals – whichever seems appropriate. This continues, iteratively, for as long as the client says they are finding it helpful or either party needs to stop for any other appropriate reason. The aim is to help the client to talk openly and freely, allowing them to shift and sustain their awareness to the source of their goal conflict. Change happens through the intrinsic, trial-and-error process of reorganization, but it needs to be focused to *the right place in the control hierarchy* and *for long enough* to make changes that resolve the conflict. Analyses of MOL sessions reveals that they contain more frequent questions than other types of counseling and psychotherapy, yet the client talks for longer compared to the therapist; the client leads the process.

Goal One: Asking About a Problem. The questioner remains curious and asks simple questions to help the client continue to explore their experience of the problem. Examples of questions include "Can you tell me more about what makes this a problem?"; "How much is this a problem right now?"; "How much does this bother you?"; "How often does this happen?"; "What's it like telling me about this right now?"; and "What is it that you want to happen?"

Goal Two: Asking About Disruptions. A disruption is something the questioner notices that disrupts or stands out from the content of what the speaker is saying. Examples include pauses, emphasizing certain words, smiles, laughs, other changes in affect, eye movements, and a sudden shift in topic. The questioner asks about them because they may indicate a *background thought* – any perception that the client may choose to bring to the foreground and talk about. Importantly, this could include thoughts about goals in conflict or, even further, the perspective from the goal that is driving the conflict. The questions need to be brief and instantaneous because the aim is to help the speaker catch these fleeting thoughts as they happen. Examples of questions include "What happened just then?"; "What's going on as you're smiling?"; "You said 'forever' – what are you thinking about that?"; "What's going through your mind as you're thinking about that?"; and "Are you noticing something there as you're telling me this?"

MOL is not aimed at changing behavior per se, but qualitative interviews reveal that people spontaneously report making different decisions and prioritizing their life goals differently after receiving MOL. Most also appear to greatly value being in control of when they have the session, how long it goes on for, and what they talk about (e.g., Griffiths et al., 2019).

For further reading on MOL, there are several manuals (Carey, 2006; Carey, Mansell, & Tai, 2015; Mansell, Carey, & Tai, 2012).

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Appendix 14.1 The Person-Situation Debate

The question of whether behavior is primarily a function of the individual or the situation has a long history in psychology, sometimes referred to as the person-situation debate. Theorists such as Bem (1972) and Mischel (1996), among others, argued in the late 1960s that the notion of stable personality traits was mistaken, given that behavior is inconsistent across situations, with the situations being a stronger predictor of behavior than personality. This stimulated a debate between "situationists" and personality psychologists and led to a number of improvements to research methods including measuring behavior in naturalistic settings and aggregating measures of behavior across multiple situations.

More recent perspectives focus more on the interaction between characteristics of the situation and personality in explaining behavior. For example, some situations place strong normative constraints on behavior and enforce a narrow range of behavioral options – such as a library – whereas others place much weaker constraints on behavior, so that personality traits have more scope to influence behavior – such as a party. In predicting how someone might behave in the former situation, knowledge of the situation will be a better predictor than their scores on a personality measure; the converse applying in the latter situation. Personality traits are even better predictors the more specific the trait is and the more situations are sampled. In addition, there is a dynamic relationship between personality and situation, such that individuals select and shape situation in ways that can be predicted from personality traits (Gazzaniga, 2018).

Ultimately, the person-situation debate has acted as an important corrective to the notion that behavior is largely and predominantly influenced by personality, highlighting the important role of situations in explaining and changing behavior. This perspective is consonant with the principles central to the neuroscience of learning and decision-making that emphasize the extent to which actions are shaped through an integration of an individual's learned values, motivational state, and situation.

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Appendix 14.2 Ways in Which Cues Within Physical Micro-Environments Can Be Altered to Elicit Changes in Behavior, Adapted From the Typology of Interventions in Proximal Physical Micro-Environments (TIPPME; Hollands et al., 2017).

Placement

AVAILABILITY

Add or remove (some or all) products or objects to increase, decrease, or alter their range, variety, or number, *e.g. Increasing the number of low-fat meal options or decreasing the number of higher-fat meal options offered at school lunches (Bartholomew & Jowers,* 2006*)*

POSITION

Alter the position, proximity or accessibility of products or objects, *e.g. Placing less healthy options further away from seating, entrance, checkout, queue line, or in a buffet (Rozin et al.,* 2011*)*

FUNCTIONALITY

Alter functionality or design of products or objects to change how they work, or guide or constrain how people use or physically interact with them, *e.g. Product packaging (designed to allow easier opening or pouring), tableware or shopping trolleys (areas on plates or in trolleys demarcated for certain foods to influence selection) (Payne et al.,* 2014*)*

PRESENTATION

Alter visual, tactile, auditory or olfactory properties of products, objects or stimuli, *e.g. Colours, textures, material and visual design of product packaging or tableware (Spence et al.,* 2014*)*

Properties

SIZE

Alter size or shape of products or objects, *e.g. Portion or package size of food, alcohol or tobacco products, such as the size of cigarette packs or the cigarettes themselves (Russell et al.,* 1980*), and the tableware used to consume food and alcohol, such as the size of wine glasses (Pechey et al.,* 2017*)*

INFORMATION

Add, remove or change words, symbols, numbers or pictures that convey information about the product or object or its use, *e.g. Nutritional labelling on food and non-alcoholic drinks (Crockett et al.,* 2018*), or health warnings of pathological consequences of consumption on tobacco or alcoholic drinks packaging (Brewer et al.,* 2016*)*

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Appendix 14.3 Elucidating the Mechanisms That Underlie Behavior Change

Elucidating mechanisms has the potential to inform optimization of interventions. Realizing this will require a systematic empirical approach drawing on a plausible theoretical model of how stimuli within the environment influence behavior. As discussed in the main text, there are a number of existing perspectives on this, many of which draw on a core distinction between behavior that arises from conscious reflection and that which is more nonconscious, automatic, and stimulus-driven. This distinction is echoed in various terminologies – implicit versus explicit; system 1 versus system 2; hot versus cold; habitual versus goal-driven; fast versus slow. All of these can be adequately encompassed within an increasingly influential framework – *model-based* (MB) versus *model-free* (MF) – which embraces this fundamental distinction while avoiding assumptions about whether these processes function in isolation and whether they are necessarily conscious or unconscious. Moreover, the MB/MF framework can credibly operate at several levels of description: the neurobiological, computational, cognitive, and behavioral.

The distinction between model-based and model-free behaviors comes from the reinforcement learning literature, which is occupied with the question of how an agent can interact with its environment to maximize reward and minimize punishment. Fundamentally, this entails a simple iterative relationship in which an agent, receiving a representation of its environment's state, takes an action leading the environment to yield an outcome (reward). When an environment is simple, predictable, and static, the process is correspondingly straightforward. A state, when encountered, should provoke the agent to select from the corresponding repertoire of actions the one that yields the highest reward. The probability distribution of actions is shaped by experience to fit the reward values of those actions – the ones provoking highest value of reward being the ones most likely to be selected. This probabilistic relationship between the environmental state and the ensuing actions is referred to in reinforcement learning as the agent's *policy*. Given the different usages of this word, we avoid this term here and use the terms behavior or pattern of behaviors. Basic reinforcement learning theory is concerned with how an agent develops and updates its behavior patterns in response to the rewards that its actions yield. There is, however, an important corollary to this that both enriches and complicates the picture: In taking action, the agent is, in many cases, changing the state of the environment. A new state may offer a new set of reward possibilities and may also be a prelude to further states offering further possibilities. Altogether, this means that, while much may be achieved through simple trial-and-error learning, an agent may simply respond to the state within which it finds itself and select the action that experience has shown to yield the best reward, however remote that reward may be. Yet the most successful agents will also incorporate learning about how environmental states change and develop longer-term plans accordingly. These two strategies form the basis for a distinction between model-free and model-based responding.

The model-based/model-free distinction can be illustrated by considering a simple agent-environment interaction: taking a route from

one point to another. A printed list of directions – take left onto road X; after 3 km turn left; take road Y for 2 miles; turn right, etc. – is comparable to a model-free approach. Each state prompts an action but the action at any given point does not draw on an overall model of the environment. Such an approach is rapid, efficient, and computationally very simple; but it is also inflexible and cannot adapt to new environmental states. A model-based approach, on the other hand, entails a model (or a map) of the wider environment: It allows and facilitates planning and successful adaptation – for example, if a road were closed; but it is much more complex, difficult to learn, and, in some settings, unnecessarily efficient.

The model-based/model-free distinction has proven remarkably powerful in its application to human learning and behavior. It is also a framework with a number of attractive features:

1. It is connected to the growing neurobiological literature on learning and decision-making, offering a well-developed set of experimentally testable computational models that have currency at multiple levels of explanation.
2. It comfortably embraces the idea that a given behavior may comprise blends of these two processing types, eschewing the simplification that it must be considered as one or the other. It also explicitly acknowledges that the balance of behavior can shift dynamically between these in response to both environment and inner states.
3. Critical to the questions under consideration here, the framework has emerged out of an explicit recognition that an agent engages in a bidirectional causal interaction with its environment. Its inner states are shaped by what the environment may offer, driving a set of stimulus-driven actions. It also recognizes that the agent's actions influence the environment.

Thus, we suggest that the model-based/model-free framework is currently the most promising one within which to consider the impact on behavior of interventions that involve changing environmental cues and for formulating and testing hypotheses about the mechanisms underpinning this.

Appendix 15.1 Detailed Descriptions of Approaches to Theory Integration

Additional Constructs

Some integrated theories are based on the addition of salient constructs from other theories. Such constructs are included because the theorist has concluded, based on observation and evidence and conceptual knowledge from other theories, that constructs of the existing theory may provide an insufficient or suboptimal explanation of the behavior and associated processes. There are numerous examples of how social cognition theories have been augmented to include additional constructs. For example, the health belief model (see Chapter 4, this volume) was extended to include cues to action (Becker, 1974; Janz & Becker, 1984); the health belief model was extended to include constructs from social cognitive theory, and the resulting integrated or "hybrid" theory was labeled protection motivation theory (Rogers, 1975; see Chapter 6, this volume); and the theory of reasoned action (Fishbein & Ajzen, 1975) was augmented to include an additional construct, perceived behavioral control, based on the construct of self-efficacy, also from social cognitive theory, and labeled the theory of planned behavior (Ajzen, 1991; Chapter 2, this volume). Protection motivation theory and the theory of planned behavior have both become well-used theories in their own right, as evidenced by the chapters in this handbook dedicated to their application in behavior change, and are not often acknowledged as integrated theories.

Interestingly, the theory of planned behavior has been the subject of considerable extension and modification to include additional constructs and based, in part, on Ajzen's (1991) suggestion that the theory is open to the inclusion of additional constructs that make a substantive contribution to the explained variance in intentions and behavior. There has been a proliferation of research augmenting the theory to include additional constructs such as moral norms, role construction, self-identity, social identity, group norms, and personality (e.g., Hamilton et al., 2017; Rhodes & Courneya, 2003; Rivis, Sheeran, & Armitage, 2009; Terry, Hogg, & White, 1999). There has also been the inclusion of other constructs that are purported to change or moderate relations between existing constructs in the theory, such as intention stability and normative versus attitudinal basis for intentions (Cooke & Sheeran, 2004; Trafimow & Finlay, 1996). In addition, the theory has been modified by differentiating the content of its key constructs: Attitudes were divided into cognitive and emotional or affective components, subjective norms divided into injunctive and descriptive norms, and perceived behavioral control differentiated into capacity and autonomy. The resulting integrated theory, labeled the reasoned action approach, purports to provide more comprehensive explanations of the determinants of intention (Fishbein & Ajzen, 2010), and syntheses of adopting the theory have suggested that it operates well in explaining variance in intentions (Hagger, Polet, & Lintunen, 2018; McEachan et al., 2016).

However, three important caveats to the augmentation of the theory of planned behavior by including additional constructs should be noted. First, the inclusion of additional constructs in the theory tends to result in statistically significant, but modest, increases in the amount of explained

variance in intentions and behavior, a particular issue when evaluating the augmented theory against the existing predictors in regression equations (Trafimow, 2004). Theorists and researchers therefore need to be mindful of effect sizes and practical significance when evaluating the contribution of additional constructs, especially when such additions come at the expense of theory parsimony. Related to this point, and consistent with the principles of converging evidence, it is important that theories that include additional constructs are subject to the same cumulative tests and converging evidence as the original theory and that such tests are compared directly against the original theory. There are some examples of this in the research, with research syntheses of tests of the theory of planned behavior demonstrating that it is consistently superior to the theory of reasoned action in accounting for variance in intentions and behavior across multiple studies (Albarracín et al., 2001; Hagger, Chatzisarantis, & Biddle, 2002). Similar findings have been reported for the reasoned action approach, at least for the prediction of behavior (Hagger, Polet, & Lintunen, 2018; McEachan et al., 2016). Third, theorists have suggested that many of the additional constructs added to the theory of planned behavior are likely to be subsumed by the existing constructs at the beliefs level. Some have argued in favor of including the additional constructs due to the value in demonstrating independent prediction, particularly when it comes to the utility of the theory in identifying targets for behavior change interventions (Conner & Norman, 2015).

The extent to which the inclusion of additional constructs constitutes an integrated theory is a matter of debate. As outlined in Sidebar 15.1, Chapter 15, this volume, many theorists view theories as living entities and open to modification with the advent of new information from observation or other conceptual or theoretical surmising. However, ad hoc inclusion of new constructs in existing theories, without adequate basis in evidence or conceptual surmising, and without clear specification of the role of the additional construct, how it relates to the constructs of the existing theory, and how it relates to, or complies with, the same set of underlying assumptions that bound the theory, will result in a low-quality theory that may not stand up to empirical tests or even be able to be tested. Theorists and researchers therefore need to provide a conceptual or empirical rationale for including the additional construct, as well as providing clear specification of the predictions of the additional constructs and how they fit with existing theory hypotheses. Finally, it is also important to clearly define the operational content of the additional construct, how it relates to constructs in the existing theory, and how it will be measured. Research should provide evidence that the additional construct can be differentiated conceptually from existing theory constructs and that measures used adequately capture the essence of the new construct.

The Core Constructs Approach

Many theorists have recognized the preponderance of multiple constructs with similar content with different labels across theories in the social psychological literature, sometimes termed a "jangle fallacy" (Block, 1995; Hagger, Gucciardi, & Chatzisarantis, 2017). The presence of such a large number of constructs hinders the evaluation of research applying theories to predict behavior due to a lack of common terminology and precision in naming and definition of constructs. One purpose of integration is to reduce redundancy among theory constructs to arrive at a set of consolidated constructs that are uniquely related to behavior. This involves collapsing the content of different constructs across theories into core categories, based on theory review and consensus among authors. Several research teams have conducted reviews of constructs in research on social cognition theories and attempted to identify

constructs with similar definition and content and collapse them into overarching categories. For example, Abraham, Sheeran, and Johnston (1998) and McMillan and Conner (2007) conducted a review of measures of constructs in leading social cognition theories applied in health behavior to identify a set of core constructs common to those theories. Based on a content analysis of psychometric measures of social cognition theory constructs, they identified four overarching categories into which the constructs could be collapsed: attitudes (with affective and evaluative subcategories), self-representations, norms (with injunctive and descriptive subcategories), control perceptions, and dispositions to act. Dispositions to act, which comprise motivation and intention measures, are depicted at the apex of the representation, consistent with the view from theories like protection motivation theory and the theories of reasoned action and planned behavior that the constructs determine intentions.

Other researchers have taken similar approaches toward paring down the myriad of available constructs from social cognition theories to a core set with minimal redundancy. For example, Noar and Zimmerman's (2005) review of constructs from five health behavior theories – the health belief model, the theory of reasoned action, the theory of planned behavior, social cognitive theory, and the transtheoretical model – identified considerable similarity or identical content and classified constructs into five overarching constructs: attitudinal beliefs, self-efficacy beliefs/beliefs about control over the behavior, normative and norm-related beliefs and activities, risk-related beliefs and emotional responses, and intention/commitment planning. Similarly, authors of five major social cognition theories arrived at a similar set of constructs in a consensus discussion aimed at identifying the determinants of HIV preventive behavior (for further discussions of this "major theorists' approach," see Appendix 15.2; Conner & McMillan, 2015; Fishbein et al., 2001), which has also been the basis for the development of other theoretical frameworks (e.g., Michie, van Straalen, & West, 2011). Taken together, it is clear that the resulting core sets of constructs emerging from these reviews have very similar or near-identical content. These attempts at synthesis advance knowledge of the determinants of behavior through the reduction of redundancy in constructs across theories and the derivation of core sets of constructs with clear labels, definitions, and content descriptions – two important components of theory integration. It offers an important basis for theorists to identify and describe theories, and also provides foundational work on which relationships represent the mechanisms by which techniques and strategies that may affect change in the constructs can be specified.

Consensus-Based Approaches

Another approach to identifying commonalities and redundancy across theories is to use expert consensus. Experts have the capacity to apply substantive informed knowledge of theories and their application to provide convergence of opinion on the content of theories and the relations between their components. The development of the "major theorists' model" mentioned in the section "The Core Constructs Approach" (see also Appendix 15.2) is an example of a model developed based on expert consensus. Such approaches have value because they provide a relatively rapid means of accessing an in-depth and broad knowledge of theory content and mechanisms (e.g., relations among them) that experts hold, which is of high utility to theorists and interventionists wanting to apply them in the development of integrated theories applicable to behavior change. For example, expert summaries of theory content (e.g., constructs and the interrelations among them) can provide the necessary "raw ingredients" for modifying existing theory with additional constructs and how they might relate to, or operate alongside, constructs within those theories.

The preeminent expert consensus approach for the description of theory content has been developed in an ongoing program of research conducted by Michie and colleagues (e.g., Carey et al., 2018; Connell et al., 2018; Davis et al., 2015). For example, Davis and colleagues (2015) proposed a more formal expert consensus system for the classification of theories with the goal of developing a description of theories and their content applied to behavior change. The approach involved the identification of available theories through a systematic review of current literature using search criteria based on a previously agreed criteria for what constitutes a theory (see Sidebar 15.1, Chapter 15, this volume). The theories were then assessed on the basis of their quality against predefined criteria and their frequency of use and content. The results indicated that relatively few theories were applied with high frequency in the literature and that many focus mainly on content relating to capability and motivation, consistent with the content of theories identified in reviews of core constructs.

Subsequent research has applied a similar approach to specifying links between constructs from identified theories and specific behavior change techniques, that is, the methods that are used to affect change in theoretical constructs and comprise the "active ingredients" of behavior change interventions (Michie et al., 2011). The research has yielded a searchable database of links between constructs and techniques based on available literature and expert consensus. Such a database is an extremely useful tool for the integrated theorist because it not only provides an evidence-based list of potential constructs that have been utilized in theories across the literature but identifies potential techniques to change them that will be of use for the development of behavior change interventions based on the integrated theories. In addition, by implication, the list also provides inference as to the potential mechanisms available. By definition, links between constructs and the techniques that could potentially change them imply a "mechanism of action" by which those constructs relate to behavior, which is useful in the development of integrated theories that requires specification of additional constructs and links between them. Future work in this area aims to further develop the database of links between theory constructs and techniques that is regularly augmented and updated by machine learning using existing and new evidence. Taken together, expert consensus approaches provide useful tools for the integrated theorist in specifying theory content and mechanisms and may also inform development of the content of behavior change interventions by identifying techniques that would change the targeted theory constructs.

A Utility-Based Approach

A primary motive for the development of integrated theories is to develop theories that are useful in identifying the constructs that predict behavior and the processes by which they do so. This is a particularly pertinent approach in behavior change as interventionists are motivated in deriving models of behavior that have utility in informing the development of effective interventions to solve behavior-related problems. While many theories assume that their constituent determinants are generalizable, others suggest that such generalizability may impose limitations on their capacity and applicability. Where there is such "tension" between generalizability and utility, some theorists argue in favor of prioritizing utility (Head & Noar, 2014). Such advocacy entails a problem-focused approach to the development of integrated theories that are "fit for purpose" in explaining particular behaviors in particular contexts and for particular populations. This translates well to arguments for the development of theories or sets of mechanisms that are suited or tailored to particular behavioral problems in specific contexts or situations (see also Chapters 19 and 20, this volume). This has also been the approach adopted by many theorists who have developed integrated theories that are

applied to particular behaviors, contexts, or populations (e.g., Durazo & Cameron, 2019; Gibbons, Houlihan, & Gerrard, 2009; Schwarzer, 2008).

Two important utilitarian reasons for developing integrated theories, both of which are important to intervention development endeavors, are the reduction of redundancy and complementarity. Hagger and Chatzisarantis (2009) identified these imperatives as part of a generalized approach to theory integration with respect to health behaviors, which could also be applied to behavior change more broadly. Reducing redundancy is relevant to the imperative of reducing multiple constructs from different theories into a core set of constructs with clear labels, definitions, operationalizations, and means to measure them. The core constructs and theoretical domains frameworks outlined in the previous sections represent means to reduce redundancy and identify core constructs. These approaches were developed through review of the literature and researcher-driven comparisons of constructs and their associated labels and definitions or by expert consensus on the constructs identified and their classification under global terms and definitions. There is less work examining how these constructs relate to each other, and these approaches have tended not to be specific in determining relations among them or have tended to fall back on processes based on previous theories. For example, the "major theorists' model" identified multiple constructs from different social cognition theories and specified relations between the constructs based on previous theories such as the theory of reasoned action and protection motivation theory. As Fishbein et al. (2001) suggested, major theorists are unlikely to agree on the processes by which each construct relates to each other and to behavior (Conner & Norman, 2015). As a consequence, there is less consensus on relations among constructs than on the content of constructs themselves.

Identifying how different constructs and processes may provide complementary explanations of behavioral phenomena, and other intermediate constructs that may be antecedent to behavior, such as intentions and motives, is a further goal of theory integration. Such a process likely begins with the recognition of limitations or gaps in the scope of the explanations of behavior offered by a particular theory or boundary conditions that delimit its predictions. The latter may imply the recognition of certain conditions or contextual variables that may determine the extent to which particular theoretical constructs or processes are relevant to predicting and explaining the particular behavior and those that may be redundant. For example, risk perceptions feature prominently in many social cognition theories applied to predict behaviors, particularly behaviors that present a risk to health (Zhang et al., 2019). However, research has suggested that such perceptions are seldom relevant in determining the behavior in populations that do not perceive themselves as vulnerable or are not directly at risk (e.g., perceived risk of cardiovascular disease as a determinant of physical activity participation in younger populations). In which case, risk perceptions may not be relevant in a theory applied to that particular population. Developers of integrated theories must therefore be aware of the evidence available for particular theories, or the constructs and mechanisms from particular theories, in the context, behavior, and population of interest and formulate their hypotheses accordingly. The specificity of the theory, and its subsequent generalizability, should be titrated according to the breadth to which it is expected to apply. With respect to the previous example on the role of risk perception as a determinant, if the theorist expects the theory to apply to a broad spectrum of the population (e.g., predicting physical activity in older and younger populations), they may incorporate alternative processes or auxiliary assumptions to the theory so that it applies more broadly (e.g., they may specify the moderation of effects of risk perceptions on physical

activity participation by age or perceived vulnerability) or, if not, they may opt to omit risk perceptions from the theory altogether (e.g., if the theory is to apply exclusively to younger populations). In summary, the utilitarian approach involves reducing redundancies in constructs across theories by (1) distilling and collapsing constructs of existing theories and (2) optimizing comprehensiveness by examining complementarity in constructs and mechanisms across theories appropriate to the behavior(s), population(s), and context(s) of interest.

Appendix 15.2 Detailed Descriptions of Key Integrated Theories

The "Major Theorists' Model"

The "major theorists' model" (Conner & Norman, 2015; Fishbein et al., 2001) is an integrated theory based on consensus discussions among the authors of five major theories applied to predict behavior: the health belief model (Becker, 1974), self-regulation theory (Kanfer, 1970), social cognitive theory (Bandura, 1986), the theory of interpersonal behavior (Triandis, 1977), and the theory of reasoned action (Fishbein & Ajzen, 1975) at a National Institutes of Health workshop aimed at identifying the determinants of HIV preventive behavior. The theory is a social cognition model and identifies sets of constructs from the major theorists' own theories. The theory is illustrated in Figure 15.1, Chapter 15. The central prediction of the theory is that a given behavior is a function of intention, representing individuals' motivation toward the behavior, but also specific environmental constraints (e.g., access to facilities, availability of resources like time and money) and sufficient skills to perform the behavior (e.g., "know-how" for cooking healthy meals or using a condom, abilities to recognize and manage barriers). As with many other theories, intentions are a function of a set of belief-based constructs: perceived advantages or disadvantages for performing the behavior (e.g., attitudes, behavioral beliefs, outcome expectancies), social norms (e.g., subjective norms, social factors), self-efficacy, emotional reactions (e.g., anticipated affect, experiential attitudes), and self-discrepancy (e.g., self-image, self-identity). As with many other theories in the social cognition tradition, intentions are implicated in the process by which the belief-based constructs determine behavior. The theory is a useful example of proposed predictions based on consensus from experts, similar to the approaches used to develop taxonomies of behavior change (Michie et al., 2011) and links between theory constructs and methods of behavior change (Carey et al., 2018; Connell et al., 2018). It was also developed for a specific purpose, that is, to explain the determinants of HIV preventive behaviors, which may explain the inclusion of constructs that have not been identified as consistent across many other social cognition theories such as self-discrepancy. This is, therefore, an example where utility may have been prioritized over generalizability as advocated elsewhere (Head & Noar, 2014; Noar & Head, 2014; Noar & Zimmerman, 2005). While the theory is based on expert knowledge, which is likely to reflect cumulative knowledge on the determinants of action and previous research, and has face validity, it has not been formally tested (Conner, 2015). In addition, while it incorporates important variables that may reflect environmental influences, it is a social cognition theory and therefore subject to the information-processing and rational decision-making assumptions.

The Integrated Behavioral Model

Like the major theorists' model, the integrated behavioral model is a social cognition theory based on the theories of reasoned action and planned behavior and therefore focuses on belief-based determinants of intentions and

behavior (Montaño & Kasprzyk, 2015; see Figure 15.2, Chapter 15, this volume). However, the model also accounts for additional constructs as direct predictors of behavior, particularly habits and skills, indicating a move away from an exclusively reasoned, deliberative approach. Similar to the reasoned action approach (Fishbein & Ajzen, 2010), the model proposes three sets of differentiated determinants of intentions: attitudes differentiated into experiential and instrumental attitudes, perceived norms differentiated into injunctive and descriptive norms, and personal agency into perceived control and self-efficacy. Consistent with many previous theories, intentions are proposed as a mediator of the effects of the three sets of beliefs on behavior and, importantly, represent the reasoned, deliberative process by which these factors determine behavior. Consistent with the major theorists' model (Conner & Norman, 2015; Fishbein et al., 2001), behavior is also viewed as constrained directly by individuals' knowledge and skills to perform the behavior and environmental constraints.

A primary distinction of the integrated behavioral model from the major theorists' model is that it includes two additional constructs that are conceptualized as direct determinants of behavior: habit and behavioral salience. The inclusion of habit follows previous research recognizing that the inclusion of past behavior in tests of social cognition theories leads to greater explained variance in behavior and the reduced impact of intentions and other social cognition constructs on behavior. In fact, the inclusion of past behavior as habits has been considered a major influence in previous social cognition theories, such as Triandis's (1977) theory of interpersonal behavior. Such effects were assumed to reflect habitual decision-making, that is, the extent to which individuals' behavior was the result of nonconscious, automatic, or conditioned processes, independent of intentions, as opposed to the reasoned processes reflected in the intention mediated effects on behavior. Such distinctions have proliferated in research in recent years, particularly with the advent of measures of habit that capture additional content such as automaticity (Hagger, 2019; Verplanken, Aarts, & van Knippenberg, 1997; Verplanken & Orbell, 2003; Wood, Quinn, & Kashy, 2002; Chapter 13, this volume) and go beyond accounting for past behavior. The inclusion of habit as a direct predictor therefore recognizes that behavior is not merely a function of beliefs and reasoned, rational processes but may also be a function of previous experience, which builds associative behavioral responses with contextual or environmental cues and leads to faster, efficient behavioral enactment, a process that individuals are unlikely to have direct access to. These two pathways are consistent with dual-process theories of behavior (Evans & Stanovich, 2013; Strack & Deutsch, 2004; Chapter 12, this volume), which recognize that behavior is determined by constructs reflecting nonconscious influences (e.g., habits, sometimes referred to as "system 1" processing) and deliberative processes (e.g., attitudes, norms, personal agency, sometimes referred to as "system 2" processing). The integrated model therefore reflects advances in theory and conceptualization of the determinants of behavior and dual-process theories through the inclusion of habits alongside effects of intention.

However, it is important to note that the integrated behavioral model has not yet been tested extensively. One test aimed at predicting male circumcision as a means to prevent HIV among rural communities in Zimbabwe (Montaño & Kasprzyk, 2015). The test involved elicitation of key beliefs underpinning the determinants of intentions in the model as well as direct measures of model constructs. The research demonstrated associations between beliefs and intention determinants and supported the effectiveness of the research in accounting for variance in male circumcision intentions. The research, however, did not predict behavior nor did it include measures of habit as predictors.

The research also examined the efficacy of an intervention based on the theory in changing male circumcision intentions. Brief persuasive messages were developed from the beliefs shown to be most strongly related to intentions in pilot work. The messages were delivered via posters and billboards across Zimbabwe. The messages were shown to result in positive changes in beliefs and intentions toward male circumcision. Effects on behavior were not, however, conducted. Overall, while this intervention seems to provide preliminary evidence in support of the integrated behavioral model, evidence is sparse, particularly in the role of habits alongside the belief-based constructs as a predictor of behavior and how these sets of processes may be reliably targeted in behavior change interventions.

Prototype Willingness Model

The prototype willingness model (Gerrard et al., 2006, 2006; Gibbons, Houlihan, & Gerrard, 2009) was developed to provide a more effective account of risky behaviors that can compromise health, particularly health-risk behaviors for adolescents such as unprotected sex, drink driving, and binge drinking. The model is purported to provide a more effective account of the determinants of these kinds of behaviors, and the processes involved, than other social cognition theories, like the theories of reasoned action and planned behavior by incorporating elements from dual processing models. They surmised that because risky behaviors are rewarding and likely to have been performed in the past, and because individuals who have performed these behaviors in the past are highly likely to encounter opportunities to perform the behavior, traditional theories, with their focus on behavioral intention and reasoned consideration of outcomes and behavioral advantages, are inadequate. In response, they proposed the prototype willingness model that incorporates elements of social cognition theories such as the theory of reasoned action, and elaboration likelihood model, a dual process model that proposes two pathways or routes to behavior: one that reflects reasoned decision making based on the deep, *elaborative* processing of information, and another that reflects context-driven responses that determine behavior when the opportunity arises based on *heuristic* processes. A schematic of the model is presented in Figure 15.3, Chapter 15, this volume. The reasoned route is represented by effects of attitudes, which also includes perceptions of risk of the behavior, and subjective norms on behavior mediated by intentions, consistent with the premises of social cognition models like the theory of reasoned action. Unique to the model, the heuristic route is represented by effects of beliefs like attitudes and subjective norms, but also individuals' evaluations of behavioral prototypes, that is, their representation or image of the typical person who would engages in the risky behavior, on behavior mediated by behavioral willingness. Willingness reflects the extent to which an individual is willing to perform the risky behavior given the social context and past experience with the behavior. To the extent that individuals' prototype favorability (e.g., viewing the social image of a person of the same age who smokes cigarettes or drinks alcohol favorably; "they are 'cool'") and similarity (e.g., they are "very much like me") evaluations are positive and close to their self-image, they will likely be willing to enact the behavior and act through the social reactive pathway and heuristic processing. The specification of dual pathways in the model provides an example of how both constructs and processes from multiple theories (e.g., theory of reasoned action, elaboration likelihood model) have been incorporated to provide an explanation of specific types of behavior.

Research has applied the prototype willingness model to predict health motivation and behavior for many health-risk behaviors in adolescents, particularly alcohol consumption (Gerrard et al.,

2006) and smoking behavior (Gerrard et al., 2005). However, the model has also been applied further afield with applications in adult populations (e.g., Spijkerman et al., 2010; Stock et al., 2013) and for health protective behaviors like physical activity (Hampson et al., 2007) and sunscreen protection (Heckman & Coups, 2011). Meta-analysis of the application of the model suggests that prototype favorability and similarity were related to behavioral willingness and behavior with small-to-medium effect sizes (van Lettow et al., 2016). There is also evidence of synergistic effects of favorability and similarity on behavior, with small-to-large effect sizes. Interventions were shown to be effective in producing positive changes in willingness, intention, and actual behavior for health-risk and health-protective behaviors, although there was substantive variability in effect sizes. Typical interventions based on the model used messages promoting favorable and similar prototypes as the key behavior change technique strategies. For example, Andrews and colleagues (2011, 2013) demonstrated that an intervention providing unfavorable social images (prototypes) of smokers (discussing prototypes of smokers as not exciting or cool) led to short- and long-term changes in willingness to smoke in elementary school children. Similarly, Lewis et al. (2017) provided information challenging favorable alcohol drinker norms and personalized normative feedback with respect to drinking behavior in adolescents. Results indicated that not only did the intervention increase favorable abstainer prototypes and behavioral willingness but it also affected changes in drinking behavior mediated by these constructs from the prototype willingness model.

The Integrated Behavior Change Model

Integrated theories such as the integrated behavioral model and prototype willingness model demonstrated the advantages of drawing from other theories to augment model predictions and provide more comprehensive predictions of behavior. Specifically, these models illustrate the value of including additional constructs from theories such as social cognitive theory and the theory of interpersonal behavior as well as processes from the elaboration likelihood model and, more broadly, dual-process theories of behavior. This has led to a proliferation of integrated models, many of them seeking to move beyond the reasoned, intentional determinants of behavior that are the mainstay of many social cognition theories and incorporate additional processes that reflect more automatic processing (e.g., Chu & Chiu, 2003; de Vries et al., 2005; Fuchs et al., 2012; Johnson et al., 2010). In addition, the recognition from meta-analytic research on social cognition theories that relations between intentions and behavior are imperfect with small-to-medium effects sizes has indicated that individuals do not often act on their intentions (e.g., Armitage & Conner, 2001). This has been eloquently evidenced by work identifying inclined abstainers (Orbell & Sheeran, 1998) or unsuccessful intenders (Rhodes & de Bruijn, 2013). This has led to researchers developing models that integrate constructs and processes that explain intention enactment, such as the health action process approach (Schwarzer, 2008; Zhang et al., 2019; Chapter 7, this volume) that incorporates constructs and predictions from social cognition theories (e.g., Bandura, 1986) and theories relating to action control (e.g., Heckhausen & Gollwitzer, 1987).

Such research has inspired a new breed of integrated theory that derives its predictions from social cognition theories, dual-process models (Chapter 12, this volume), and dual-phase approaches (Chapter 7, this volume). These models integrate constructs and pathways that represent multiple processes to arrive at more comprehensive explanations of behavior as well as the mechanisms involved. They may also provide important formative research on which behavior change interventions can be based. An

example of these models is the integrated behavior change model, a dual-process, dual-phase integrated model that draws its predictions from multiple theories. The model is presented in Figure 15.4, Chapter 15. Consistent with dual-process theories, the model proposes two routes to action: a reasoned path represented by effects of social cognition constructs from the theory of planned behavior mediated by intentions and a nonconscious pathway represented by implicit attitudes and motives and effects of past behavior. Implicit attitudes and motives reflect positive and negative evaluations and motivational orientations derived from repeated past experiences with the target behavior covarying with evaluations. Such evaluations are stored in associative memory along with other knowledge and contextual information about the behavior. The evaluations may be activated on presentation of salient information related to the behavior (e.g., context, cues) and may activate concomitant approach or avoidant behavioral responses. Such beliefs are likely to determine behavioral participation without deliberation, with the individual having little awareness of the processes that line up the behavior. In addition to outlining these two pathways to action, the model also identifies action planning as a moderator of the intention-behavior relationship. This is based on research grounded in dual-phase theories that stress the key role planning plays in the enactment of intentions. For example, research examining the effects of "if-then" plans or implementation intentions (Gollwitzer & Sheeran, 2006; Chapter 6, this volume) demonstrates substantially greater behavioral participation among those prompted to plan compared to those who do not. A final prediction of the model is the integration of motivational orientations from self-determination theory as a predictor of the social cognition constructs. This is based on the premise that individuals who feel that their actions in the particular behavioral context are self-endorsed and freely chosen are more likely to seek out behaviors that offer such experiences and align their beliefs (attitudes, subjective norms, and perceived behavioral control accordingly).

As with the integrated behavioral model (Montaño & Kasprzyk, 2015), there have been, to date, relatively few full tests of the integrated behavior change model. Hagger, Trost et al. (2017) conducted a complete test of the model in the context of sugar consumption, adopting a prospective design with self-report measures of model constructs and implicit attitudes toward sugar measured using an implicit association text. The model was effective in predicting sugar consumption measured two weeks later, with effects of intentions and implicit attitudes on behavior, intentions predicted by attitudes and subjective norms, but not perceived behavioral control, and effects of autonomous motivation on attitudes and perceived behavioral control. However, contrary to model predictions, planning did not moderate the intention-behavior relationship. Other studies have partially tested model predictions, with self-reports of behavioral automaticity substituting for implicit attitudes or motives to represent the nonconscious route. Such research has generally supported model effects, although the relative contribution of constructs representing the reasoned and nonconscious routes varies, consistent with many social cognitive models, and supports advocacy for developing behavior-, context-, and population-specific tests of the model (Chapter 19, this volume). To date, the model has not been used as a basis for the design of behavior change interventions, and research is needed to design and test interventions that target multiple constructs in the model and examine their effects on behavior consistent with the processes outlined in the model.

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Appendix 18.1 Sample of Environmental-Level Change Methods with Definition, Parameters and Examples Derived from Bartholomew Eldredge et al. (2016)

Method	Definition	Parameters for Use	Examples
Systems change (systems theory, Best, 2011; National Cancer Institute, 2007)	Interacting with the environment to change the elements – and the relationships among elements – of a system at any level, especially through dialogue with stakeholders, action, and learning through feedback.	Methods and actors depend on the level of the system.	A city's transportation department created bicycle lanes on streets to encourage people to ride bicycles to work as a result of a stakeholder advisory committee's recommendations. The committee monitored the use of the bicycle lanes and held a focus group for cyclists to talk about their experiences.
Enhancing network linkages (theories of social networks and social support, Holt-Lunstad & Uchino, 2015; Valente, 2015)	Training network members to provide support and members of the target group to mobilize and maintain their networks.	Available network.	A patient educator helps a stroke patient and her family members to make plans for the patient to return home. The plans include linking to a patient support group and community day care.
Sense-making (organizational development theory, Weick & Quinn, 1999)	Leaders reinterpret and relabel processes in organizations, create meaning through dialogue, and model and redirect change.	Needs continuous change, including culture change.	A supervisor in a hospital talks to his staff about the positive aspects of finding and correcting mistakes in the documentation of medication administration.

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Method	Definition	Parameters for Use	Examples
Participatory problem-solving (organizational development theories; social capital theory; models of community organization, Butterfoss et al., 2008; Cummings & Worley, 2015; Wallerstein et al., 2015)	Together with the target group, diagnosing the problem, generating potential solutions, developing priorities, making an action plan, and obtaining feedback after implementing the plan.	Requires willingness by the behavior change professional to accept the participants as equals and as having a high level of influence; requires target group to possess appropriate motivation and skills. Will often include goal setting, facilitation, feedback and consciousness raising.	A health promotion consultant helps employees of a small company to identify the level of perceived work stress and the sources of work stress. A plan is developed with the support of management to address sources of stress and provide coping strategies, to implement the plan, and to monitor perceived work stress.
Agenda setting (multiple streams theory, advocacy coalition theory, theories of power, Clavier & de Leeuw, 2013; Sabatier, 2003; Weible, 2008; Weible et al., 2009)	Process of including an issue in the political agenda for action; may make use of broad policy advocacy coalitions and media advocacy.	Requires appropriate timing (see policy window) and collaboration of (media) gatekeepers. Will often include persuasive communication and consciousness raising.	A child health advocacy group developed a position paper on the expansion of the child health insurance program. They released the report to the media and held meetings with key state legislators about the recommendations.

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Appendix 18.2 Major Environmental-Level Theories: References, Key Concepts, Examples, and Methods of Change

Level and Theory	Brief Description	Examples	Method for Change
General environmental level			
Systems theory (National Cancer Institute, 2007)	A conglomeration of interdependent and interrelated components (e.g., processors – sometimes indicated as "black boxes" as their precise internal workings may not matter, channels and connectors, and feedback mechanisms) that responds to internal and external inputs, throughputs, and outputs. This theory is regularly used to describe complex adaptations to dynamic change at multiple levels (Anderson et al., 2013; Van Beurden et al., 2013).	Anti-bullying programs: A school-wide approach operates under the assumption that bullying is a systemic social problem and that finding a solution is the collective responsibility of everyone in the school (Juvonen & Graham, 2014).	Systems change (Best et al., 2012; National Cancer Institute, 2007)
Theories of power (Turner, 2005)	Power is the ability or capacity of individuals, groups and/or agencies to determine the behavior of others. It comes in various forms that range between "soft" and "hard," e.g., charisma, authority, and legitimacy (Weber, 1947); Power "with" (e.g., leading to empowered communities) is different from power "over" (e.g., exercised through direct or indirect control) (Wallerstein et al., 2015).	A leadership intervention with an elite disability soccer team focused on "power with" rather than "power over" (Slater & Barker, 2019).	Coercion (Freudenberg & Tsui, 2014; Turner, 2005); Community development; Social action (Minkler & Wallerstein, 2012); Agenda setting; Creating and enforcing laws and regulations (Clavier & de Leeuw, 2013)

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Level and Theory	Brief Description	Examples	Method for Change
Empowerment theories (Wallerstein et al., 2015)	Empowerment (and effective participation) aims to increase the autonomy and self-determination of individuals, groups, and agencies. It can be viewed as a process as well as an outcome (Aiyer et al., 2015); Collective efficacy (Bandura, 1997) is a group version of the individual capacity.	A community can experience enhanced efficacy, e.g. by mounting a successful campaign to lobby the City Council to pass a clean indoor air act (Commers et al., 2005).	Participation (McCullum et al., 2004); Enactive mastery experiences (Kelder et al., 2015)
Interpersonal level			
Social cognitive theory (Kelder et al., 2015; Chapter 3, this volume)	People's behaviors are determined by a series of interrelated internal and external constructs, such as outcome expectations, self-efficacy, behavioral capabilities, observational learning, and the environment (Bandura, 1986).	A program improving drug users' self-efficacy for using clean needles must also facilitate making clean needles easily accessible (Golden & Earp, 2012).	Active learning; Reinforcement; Enactive mastery experiences; Modeling; Facilitation (Bandura, 1997; Kelder et al., 2015)
Social network and social support theories (Holt-Lunstad & Uchino, 2015; Valente, 2015; Chapter 29, this volume; Chapter 43, this volume)	Social networks – providing emotional, instrumental, informational, and appraisal support – play a critical role in shaping and changing behaviors within and between the individuals that make up these networks.	Legislation to support social networks: family leave acts, policies to promote volunteerism, and funding for child and elder care (McLeroy et al., 2001).	Enhancing network linkages; Developing new network linkages (Holt-Lunstad & Uchino, 2015; Valente, 2015); Use of natural helpers, peers, or lay health workers (Tolli, 2012)
Theories of stigma and discrimination (Bos et al., 2013)	Stigma is a perceived negative attribute that results in demeaning and/or pejorative attitudes and actions. It takes on various forms: public stigma, self-stigma, stigma by association, and structural stigma.	Interpersonal contact with people with mental illness may reduce stigmatization, under certain conditions: when the contact is in vivo, addresses key groups, is local, is with an individual with a similar role, and is continuous (Corrigan & Kosyluk, 2013).	Interpersonal contact; Cooperative learning (Corrigan & Kosyluk, 2013); Reducing power differences (Link & Phelan, 2001)

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Level and Theory	Brief Description	Examples	Method for Change
Diffusion of innovations theory (Brownson et al., 2015)	Innovations cascade through groups and society in fairly standard patterns. This process of diffusion has several different phases: Dissemination, Adoption, Implementation, and Maintenance (institutionalization, sustainability, Wiecha et al., 2004). This provides a framework in which to understand and facilitate the routinization of new behaviors of both individuals and agencies.	Teachers adopting a new sex education program must know that the program is available, see the benefits of it, find it easy to use, and believe that relevant others will support their use of the program (Schutte et al., 2014).	Modeling (Kelder et al., 2015; Chapter 3, this volume); Technical assistance (Flaspohler et al., 2008); Mass media role modeling (Rogers, 2003); Entertainment education (Shen & Han, 2014)
Organizational level			
Organizational change theories (Cummings & Worley, 2015)	Organizations respond to externalities in order to survive and grow. Force field analysis (Lewin, 1947) and continuous change (Brown et al., 2014) models are two perspectives on this responsiveness.	Based on sense-making – combining knowledge elicitation and organizational development – a technique was developed to solicit judgmental knowledge from the staff in order to formulate a business strategy (Yip, Lee, & Tsui, 2015).	Sense-making (Weick & Quinn, 1999); Advocacy and lobbying (Cummings & Worley, 2015)
Organizational development theories (Cummings & Worley, 2015)	Organizations also display unique behaviors that can be seen and explained through a psychology lens, e.g., planned change framework (Schein, 2010); stage theory of organizational change (Butterfoss et al., 2008).	The Evidence-Based System for Innovation Support (EBSIS) increased the effectiveness and efficiency of support activities within an organization in order to build capacity for the implementation of innovations (Wandersman et al., 2012). See also Sidebar 18.1, Chapter 18, this volume.	Sense-making (Weick & Quinn, 1999); Participatory problem-solving; Organizational diagnosis and feedback; Team-building and human relations training; Structural redesign (Cummings & Worley, 2015)

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Level and Theory	Brief Description	Examples	Method for Change
Stakeholder frameworks (Kok et al., 2015)	Individuals, groups, communities, and agencies affected by and influencing the behaviors of themselves and others can be described as "stakeholders." The degree to which they can engage with – and positively change – their interests depends on power, legitimacy, and urgency (Kok, et al., 2015).	A small and seemingly powerless community in Louisiana persevered to defeat the strategic plans of a multinational chemical company that was supported by local and state government (Berry, 2003).	Increasing stakeholder influence; Social action (Kok et al., 2015)
Community level			
Coalition frameworks (Butterfoss & Kegler, 2012)	Psychological coalitions are sets of like-minded (community) members that strive for social and political engagement. Such community coalitions (Butterfoss & Kegler, 2009) have a life cycle toward sustainability (or decay) that requires variable resources, skills, and perceptions at individual and community levels.	The Community Coalition Action theory, as applied to the California Healthy Cities and Communities. Coalitions progress from formation to maintenance to institutionalization, with each stage requiring different skills and resources (Kegler & Swan, 2011).	Participatory problem-solving (Cummings & Worley, 2015); Technical assistance (Flaspohler et al., 2008); Forming coalitions (Clavier & de Leeuw, 2013)
Social capital and community capacity (Szreter & Woolcock, 2004)	Individuals and communities connect to become stronger through "social capital" (in itself an important determinant of health). There are different kinds of social capital: bonding, bridging, and linking. Community capacity is a means and an end in itself (Wendel et al., 2009).	Linking individuals to social networks and community organizations is important. It is also important for residents to have loose ties outside their primary networks in order to bring in new resources (Steckler, Goodman, & Kegler, 2002).	Community development; Participatory problem-solving (Wallerstein et al., 2015); Technical assistance (Flaspohler et al., 2008); Forming coalitions (Clavier & de Leeuw, 2013)
Social norms theories (Smelser, 1998, 2011; Chapter 16, this volume; Chapter 44, this volume)	Social norms are a quintessential element of institutional and governance arrangements; they are shaped and transmitted at the community level. Social rules and socialization (Smelser, 1998) are core to the establishment and maintenance of social norms.	Behavioral journalism is based on the assumption that some people in a group are more successful than others at reducing risks. These early adopters can serve as models for their less successful peers. Role models are based on stories derived from authentic interviews (Van Empelen et al., 2003).	Entertainment education (Bouman, 2017); Behavioral journalism (Reininger et al., 2010); Mobilizing social networks (Valente, 2015); Mass media role modeling (Rogers, 2003)

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Level and Theory	Brief Description	Examples	Method for Change
Conscientization (Freire, 1968, 1974; Wiggins, 2012)	Education and the "pedagogy of the oppressed" are key to making individuals and communities conscious and conscientious of their fate. Only militant awareness leads to empowerment, critical consciousness (Gadotti, 1994), and reflection-action-reflection (Wallerstein et al., 2015).	Low-income elderly – living in residential hotels – have formed building tenants' associations, achieved better living conditions, and received compensation for lack of services (Minkler, 2004). In practical terms, Freirian pedagogy sees (free and freedom) education as a coproduction of knowledge between student/community and expert/society.	Problem-posing education (Wallerstein et al., 2004)
Community organization (de Leeuw & Simos, 2017)	In high-level coalition and empowerment perspectives, communities organize to drive political and institutional decision-making, community-building versus empowerment-oriented social action (Minkler & Wallerstein, 2012), and advocacy (Galer-Unti et al., 2004; Wallack (2002).	Volunteers from the El Pueblo neighborhood presented their findings to the city council who approved the installation of speed bumps to slow traffic and reduce drug dealing as a top priority (El-Askari & Walton, 2008).	Participatory problem-solving (Wallerstein et al., 2015); Forming coalitions (Clavier & de Leeuw, 2013), Peer education (Tolli, 2012); Media advocacy (Dorfman & Krasnow, 2014); Framing to shift perspectives (Snow et al., 2004); Social planning; Community assessment (Rothman, 2008)
Societal level			
Theories of the policy process (Sabatier & Weible, 2014; Clavier & de Leeuw, 2013)	The policy process can be understood through its own rationalities in which "who gets what, why and how" (Lasswell, 1936) are determined. Different conceptualizations, e.g. multiple streams (Kingdon, 2003); advocacy coalition framework (Sabatier, 1988); and punctuated equilibrium theory, (Baumgartner & Jones, 2010) suggest patterns of power, interest, engagement, democracy, and political participation.	The AIDS epidemic enabled the harm reduction coalition to overthrow the abstinence coalition in the drugs policy system. Bleach kits and needle exchange programs became policy options (Kübler, 2001). Tobacco control in Quebec: With the public health community deliberately taking a political advocacy position – and continued stakeholder analysis – they managed to pass legislation (Breton et al. 2008).	Agenda setting; Creating and enforcing laws and regulations (Clavier & de Leeuw, 2013); Timing to coincide with policy windows (Zahariadis, 2007); Stakeholder politics (Breton et al., 2008)

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Level and Theory	Brief Description	Examples	Method for Change
Multiplex policy network analysis (de Leeuw et al., 2018)	The original policy network theory suggests that the relative positions of important actors can be understood as elites competing over access to the policy agenda in networked systems (Börzel, 1998). Changing these networks to meet policy agendas requires additional policy frame analysis (Rein & Schön, 1996). The "structure" dimension of the network perspective overlaid with the "agency" view yields new opportunities for engagement in (behavior) change.	Evidence-based policy is dependent not only on the facts but also on how actors in the system "feel about those facts" (Oliver & Cairney, 2019). For example, the acceptance and legislation of euthanasia in countries like the Netherlands, Belgium, and Switzerland are at odds with the ban on assisted death in Germany and Australia; all these countries use the same evidence base applied to similar policy networks – but within different policy frames.	Rhetorical and narrative devices (Davidson, 2017) applied to policy networks (de Leeuw, 2018)

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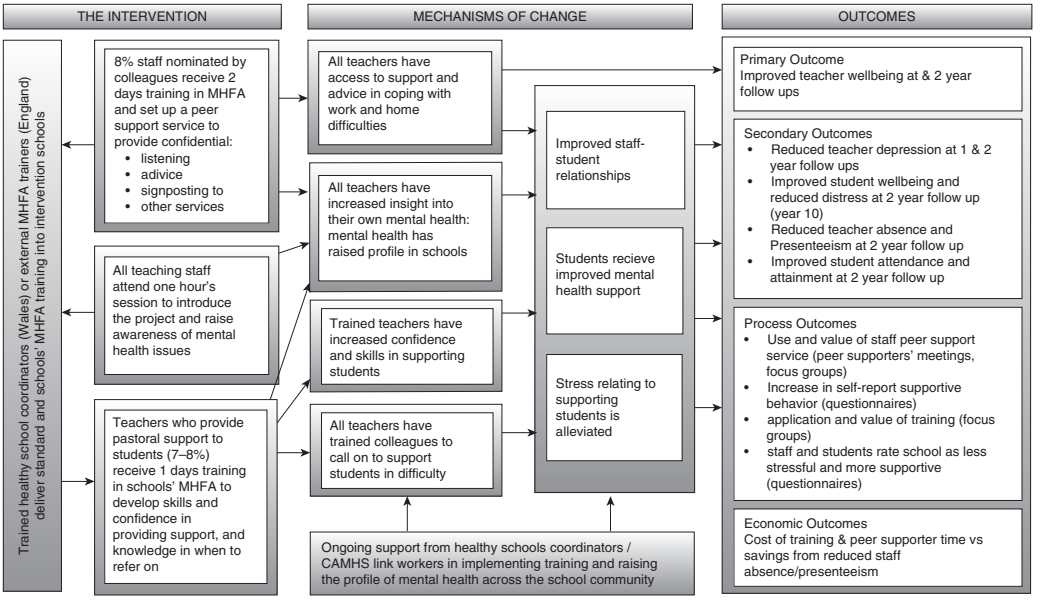
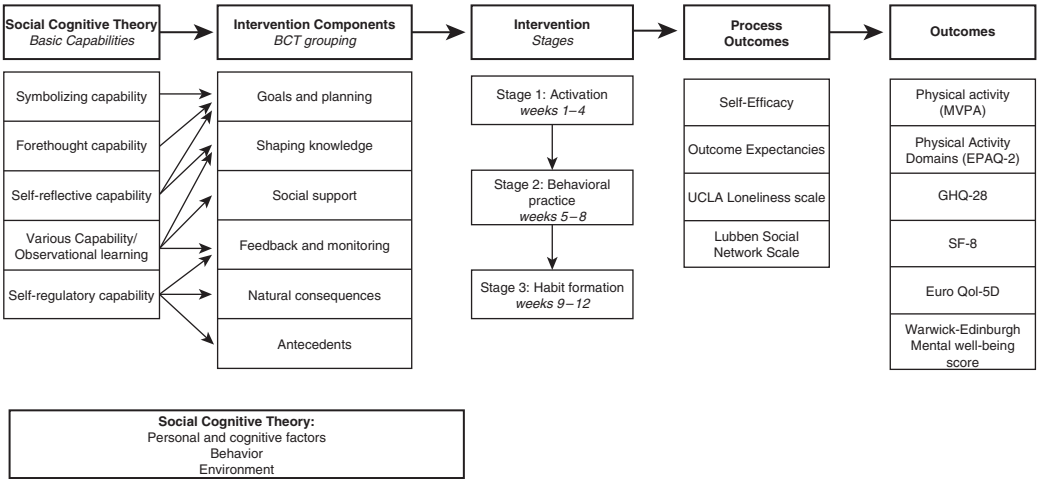
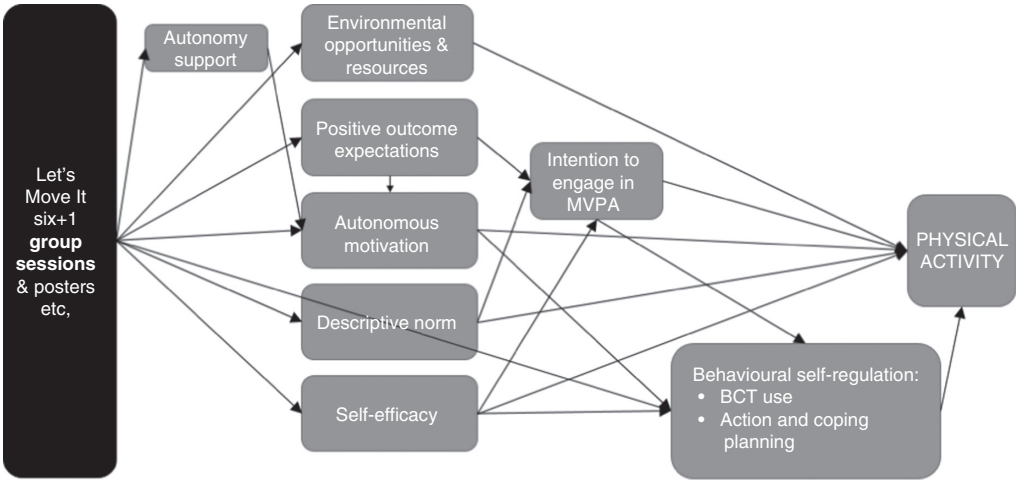
Appendix 21.1 Examples of Program Theories and Logic Models

1) Wellbeing in Secondary Education (WISE) logic model (Evans et al., 2018).



2) "Walk with Me" study logic model (Tully et al., 2019).





3) Simplified program theory (theory of change) of the Let's Move It student intervention to increase physical activity, focusing on key determinants that were measured in trial questionnaires (Hankonen et al., 2019).

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Appendix 21.2 Criteria and Considerations for Choosing Determinants, Objectives, and Intervention Components

The selection of determinants (or influences on behavior), objectives, and intervention components (e.g., behavior change techniques, fidelity procedures) needs to be informed by evidence and theory. Evidence could be accessed from systematic reviews, quantitative studies, or qualitative research (e.g., interviews or focus group with the target group and stakeholders).

Usual criteria for selection of the determinants, objectives, and intervention components include

- **Changeable.** Example: Is there evidence/plausibility that a candidate determinant can be changed by the proposed intervention; or is a behavioral objective really changeable within the constraints of this intervention?
- **Acceptable.** Example: Are the potential intervention components acceptable to all stakeholders (see also Sekhon et al.'s [2017] framework)?
- **Practicable.** Example: Can the proposed components be delivered with fidelity? Is it feasible?
- **Effectiveness/relevance (of determinants)/importance.** Example: Is the determinant or behavior change technique causally linked with the target behavior? What is the strength/weight of the evidence?
- **Affordable.** Example: Can the choice of determinant or component be paid for with the constraints of this intervention?
- **Side effects.** Example: Consider the "first, do no harm" principle – does this intervention development choice have the potential to lead to unintended consequences?
- **Equity.** Does this choice increase socioeconomic inequities?

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Appendix 21.3 Variety of Designs and Empirical Methods to Address Uncertainties during Intervention Development

	Method					
Tasks	Stakeholder consultations	Survey	Experimental study	Interviews (individuals or groups)	Literature review	Practical pretesting of intervention/ prototype
Task 1						
Problem analysis	✓	✓		✓	✓	
Intervention objectives:						
Who? Target group	✓	✓		✓	✓	
What? Target behaviors	✓	✓		✓	✓	
Task 2						
Understand behavior	✓	✓	✓	✓	✓	
Select determinants	✓	✓	✓	✓	✓	
Select BCTs			✓		✓	✓
Ensure acceptability	✓	✓		✓		✓
Ensure practicability	✓			✓		✓
Task 3						
Ensure feasibility of materials	✓			✓		✓
Task 4						
Assess feasibility and acceptability	✓	✓	✓	✓		✓

Appendix 21.4 Methods Used in Intervention Development

In addressing uncertainties during intervention development, one can review previous evidence (literature reviews), conduct new research (e.g., surveys), and review relevant theory. Decisions depend on the key uncertainties and available resources.

1. Literature Reviews

Literature reviews involve evidence synthesis and can address many uncertainties when deciding on the determinants of the target behavior (Bartholomew Eldredge et al., 2016; Craig et al., 2008), promising behavior change techniques, and intervention features. Literature reviews include the following types:

a. Published (systematic) reviews. Relevant evidence can be found in Cochrane Library, Campbell collaborations' databases, PROSPERO or electronic databases and journals. Grey literature such as policy and local government reports can supplement other literature.
b. New evidence synthesis. Existing evidence synthesis may not always be sufficiently rigorous or applicable to the proposed intervention and its context. Often additional evidence synthesis is necessary to help identify the most important predictors of behavior and to test their sensitivity to contextual features of communities, services, or geography (Araújo-Soares et al., 2018). Depending on time and resources, one could conduct a systematic review, a scoping review, or a rapid review of the evidence. It should be borne in mind that systematic reviews of trials of interventions with similar aims do not always provide sufficient answers, due to (1) insufficient evidence, (2) possibility of alternative change paths instead of one change theory, (3) not providing evidence about reach, adoption, and implementation *outside* the research setting or about long-term maintenance (Araújo-Soares et al., 2018; Dombrowski et al., 2012).

Reviewing evidence can also help identify a *suitable existing intervention that could be adapted or retrofitted* (i.e., transformed for use in a novel context or population) rather than reinvented (Araújo-Soares et al., 2018).

2. Theory Review

Theory reviews are central to understanding the target behavior(s), informing the hypothesized causal pathway of intervention effects, and understanding contextual influences on causal pathways and implementation of the intervention. Intervention development can rely on a single theory of behavior, selecting intervention techniques with the potential to modify the theoretical predictors of behavior. Examples are shown in Part I of this handbook. Often, the multiple levels addressed by an intervention (individual, organizational, etc.) require consideration of a range of theories from different disciplines (e.g., psychology, implementation science, sociology). Intervention developers could use the theoretical domains framework (TDF) as an overarching framework to identify and map evidence about key barriers and enablers of target behaviors and link these to relevant theories (Francis, O'Connor, & Curran, 2012; Heslehurst et al., 2014). The TDF was developed in the context of implementation research through review and consensus methods to describe the most common explanatory

constructs in behavioral theories organized into fourteen domains: knowledge; skills; social influences; memory, attention and decision processes; social/professional role and identity; reinforcement; beliefs about capabilities; beliefs about consequences; optimism; intention; goals; behavioral regulation; emotion; environmental context; and resources (Cane, O'Connor, & Michie, 2012; Michie et al., 2005). The TDF can be used to inform qualitative and quantitative studies in order to understand key influences of behavior and identify relevant theoretical approaches (e.g., Atkins et al., 2017; Laine et al., 2017).

Theory can be used for many different purposes – for example, to understand causal pathways of behavior change, implementation, and contextual influences.

3. Empirical Studies

Empirical studies, often using mixed methods, can be used to address a wide range of uncertainties: understanding the problem, key influences on the behavior in the target group, their needs and preferences for an intervention, perceived feasibility, acceptability and engagement with the proposed intervention. Additional data collection may be helpful, especially when evidence is lacking. Some examples:

a. **Survey studies.** Survey studies allow researchers to collect large amounts of data in representative samples efficiently. For example, identifying key correlates of physical activity behavior and intention can be helpful in further specifying an intervention (Hankonen et al., 2017), bearing in mind limitations of group-to-individual level generalizations (Fisher, Medaglia, & Jeronimus, 2018).
b. **Qualitative research.** Qualitative research (e.g., interviews, focus groups, observation) help understand the participants' and stakeholders' perspective on the problem addressed, its importance, proposed research questions, the target behavior in its context, intervention content and mode of delivery, and intervention features, such as iterative testing of an app (e.g., semi-structured interviews coupled with a think aloud process).
c. **Experimental studies.** Experiments aim to identify causal evidence for hypothesized change by identifying potential modifiable causal factors and assessing whether manipulating the predictive factor(s) changes the target behavior (Sheeran, Klein, & Rothman, 2017; see also Chapter 6, this volume). This enhances our understanding the mechanisms of change and using experimental designs to clarify how to change these in controlled settings, before testing these causal pathways in real-world settings.
d. ***N*-of-1 studies.** Studies adopting *n*-of-1 designs can provide insight into intra-individual variability in the change mechanisms and their dynamics, barriers, and needs (e.g., Kwasnicka et al., 2015; Rodrigues et al., 2017) and engagement with intervention features (e.g., gamification in smartphone applications), which may help one decide which promising features to include.

4. Expert or Stakeholder Consultation

These provide crucial evidence about a wide range of issues – for example, to what extent the proposed intervention is suited to its context, what evidence is needed to commission an intervention, how to reach the intended target group, and factors influencing adoption, maintenance, and impact.

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Appendix 22.1 Key Terms and Concepts

Term	Definition
Context	"Any feature of the circumstances in which an intervention is conceived, developed, implemented and evaluated" (Craig et al., 2018, p. 1) – e.g., social, political, economic, cultural, geographical context.
Program theory	A description of how an intervention is anticipated to produce outcomes, via which mechanisms, influenced by which contextual factors, and under what conditions. Note: program theory may be referred to using other terms, such as theory of change (Rogers, 2008).
Randomized controlled trial	A study in which a number of similar people are randomly assigned to two (or more) groups to test an intervention(s) (NICE, 2019).
Natural experiment	"Events, interventions or policies which are not under the control of researchers, but which are amenable to research which uses the variation in exposure that they generate to analyse their impact" (Craig et al., 2012, p. 4).
Process evaluation	"A study which aims to understand the functioning of an intervention, by examining implementation, mechanisms of impact, and contextual factors" (Moore et al., 2014, p. 8).
System	A set of factors that are interconnected in a way that they produce their own patterns of behavior over time (Meadows, 2008). In relation to behavior change, a system typically includes complex interactions between people, populations, organizations, sectors, services, and activities (Egan et al., 2019).

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Appendix 25.1 Common Guiding Principles

The table here illustrates guiding principles that are common to many interventions. These guiding principles have been informed by self-determination theory – a model that argues motivation to engage in behavior is enhanced by supporting individuals' need for autonomy, competence, and relatedness (Ryan & Deci, 2000). They do not give an exhaustive or prescriptive list of desirable intervention qualities but highlight common insights that have arisen from the person-based approach development process.

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Intervention Design Objective	Key Intervention Features
To promote user autonomy	• Offering users choice where possible (e.g., of goals, tools, timing, method of implementation).
To promote user competence	• Providing clear structure and (optional) guidance, examples, stories modeling successfully overcoming barriers, graded goal setting, minimizing conscious effort and lifestyle disruption where possible.
To promote a positive emotional experience and sense of relatedness	• Using positive (autonomy-supportive) language throughout, giving rationale for advice, acknowledging and addressing concerns. • Ensuring all communications provide something interesting, enjoyable, relevant, and helpful for the user. • Reciprocating intervention usage by providing immediately rewarding feedback. • Following best practice to maximize accessibility, usability, and trust.

Note. Content based on Yardley et al. (2015).

Appendix 25.2 Guiding Principles from the REDUCE Study

The guiding principles set out here were developed for a digital intervention called "REDUCE," which aimed to help people maintain behavioral changes that could prevent the recurrence of diabetic foot ulcers (DFUs) in people who had previously experienced a DFU. Specifically, the intervention aimed to increase and maintain foot checking, self-referral to a health care practitioner if a DFU is suspected, physical activity, and engagement in emotional management (cognitive behavioral therapy techniques). Guiding principles were based on evidence from a scoping review of the literature and primary qualitative research undertaken by the authors (Greenwell et al., 2018). The table here outlines the key challenges to behavior identified, the intervention design objectives (what the intervention needs to do in order to overcome these key challenges), and key intervention features (how the intervention will do this).

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Behavioral Challenge Identified in the Literature/ Primary Qualitative Research	Intervention Design Objective	Key Intervention Features
People who have experienced a DFU often feel a lack of control over being able to prevent another DFU, which can cause frustration. Some feel guilt or self-blame for not engaging in foot care behaviors.	To reduce feelings of hopelessness, frustration, guilt, and self-blame following a DFU.	• Emphasize target behaviors that patients can engage in to reduce their chances of getting another DFU, while acknowledging that there are precipitating factors (e.g., increased age, neuropathy, foot shape) that are out of their control. • Enhance patients' confidence in the target behaviors (e.g., by providing a rationale for the necessity of the target behaviors, scientific evidence that behaviors are effective, patient stories, and a quiz on the benefits of the behaviors). • Validate patients' feelings of frustration and hopelessness if a DFU does reoccur and avoid arguments that may be viewed as blaming patients for this reoccurrence. • Provide links to emotional management techniques that can help people to manage difficult emotions.

Continued

Cont.

Behavioral Challenge Identified in the Literature/ Primary Qualitative Research	Intervention Design Objective	Key Intervention Features
Some people are not sure what the signs of a DFU look like or when they should seek help from a health care professional. Some people might delay help-seeking because they are worried about wasting health care professionals' time, looking foolish, or being a burden if they turn out not to have a DFU.	To build patients' confidence in making a self-referral.	• Provide links to foot checking training (e.g., by providing information and photographs on what DFUs look like, what signs to look out for, and how often feet should be checked with guided practice). • Provide reassurance that self-referral is necessary (e.g., through a foot health checklist that provides personalized feedback on whether or not patients should self-refer, based on their symptoms). • Address concerns around looking foolish or wasting the DFU team's time when self-referring (e.g., [1] emphasize that the DFU team would rather they were contacted early so they are better able to treat any DFUs, [2] provide patient stories about how other patients overcame feelings of burden).
Some people who have had a DFU have comorbidities or physical limitations, which can make it difficult to check their feet or be physically active. Some people also worry that increasing worry might cause re-ulceration.	To acknowledge that patients may have physical limitations that make it difficult to engage in foot checking and physical activity.	• Provide guidance on how to check your feet if you have physical limitations, including using a mirror to check the bottom of your feet and asking someone else to check for you. • Make intervention content on physical activity optional. • Provide guidance about a variety of safe and low-impact physical activities to enable patients to find an activity that is suitable for them. • Address physical activity concerns all the way through the intervention (i.e., in the maintenance intervention and prior initiation phase) (e.g., by providing information about the safety of physical activity, patient stories about how other patients overcame these barriers).

Continued

Cont.

Behavioral Challenge Identified in the Literature/ Primary Qualitative Research	Intervention Design Objective	Key Intervention Features
People can experience difficult emotions after a DFU. However, our qualitative work showed that not everyone does and people who do not experience difficult emotions do not think emotional management would be helpful.	To acknowledge that emotional management may not be relevant for all patients.	• Make intervention content on emotional management optional. • Emphasize that some people, but not everyone, might experience difficult emotions following a DFU to avoid excluding those who may not relate to this content. • Provide a variety of brief emotional management techniques (e.g., cognitive behavioral therapy, mindfulness techniques) to allow each person to find a technique that fits with their own personal style of managing emotions.
Some patients have concerns about whether they are computer literate enough to use a digital intervention.	To ensure patients feel confident in using the maintenance intervention.	• Keep website navigation simple and follow guidelines for maximizing website usability. • Health professionals at the prior initiation phase will provide technical support, address self-doubts, and speak favorably of the digital intervention to encourage use. • Encourage friends and family to assist people with website use, if appropriate. • Provide a booklet for quick reference and for those who do not have access to the internet.

Note. Content adapted from Greenwell et al. (2018).

Appendix 25.3 Qualitative Think-Aloud Interview Guide

This interview guide was used in the Diabetes Literacy project, an international project to develop a physical activity intervention for people with low levels of health literacy and Type 2 diabetes (Rowsell et al., 2015).

References

Rowsell, A., Muller, I., Murray, E. et al. (2015). Views of people with high and low levels of health literacy about a digital intervention to promote physical activity for diabetes: A qualitative study in five countries. *Journal of Medical Internet Research*, *17*, e230. https://doi.org/10.2196/jmir.4999

Think-Aloud Interview Guide

We're interested in your views of our new online advice for people with diabetes. All you have to do is use the website as you would normally if I was not here and say your thoughts out loud.

To help you think aloud you may find it useful to read aloud or tell me what you are clicking on and why. You may find at times I will say aloud what you have clicked on or what page you are looking at – this is just so when I listen to your views again, I know what part of the website you are talking about.

This is not a test and you are not being judged. There are no right or wrong answers, so please say any thoughts which spring to mind, even if you think they might not be important. I just want you to say out loud any thoughts which are running through your mind.

Please do feel free to say any negative thoughts you may have about the advice as these will be really useful in helping us improve it. Your views are really important, the more you can tell us, the better.

After you have finished looking at the website, I would like to have a chat with you about your experiences with your overall views of the website.

Prompts About the Advice

What are your first impressions?

What are you thinking now?

Why did you choose that option?

What do you think about [this activity; this information; this video]?

What do you think about following this advice?

Neutral Prompts

That's interesting, could you say a bit more about that?

What makes you say that?

Could you tell me more about that?

Why do you think that?

What do you think about that?

Post Think-Aloud Questions

Can you tell me about your first thoughts when you saw the website?

How did you find the website overall?

What did you like about the advice?

What did you dislike about the advice?

How do you feel about the physical activity advice in the website?

Have you come across websites like this before? If so, how does this one compare?

Which bits of the website kept your attention?

Which bits of the website were particularly helpful/not helpful?

Were any parts of the website complicated? If so, can you tell me about these?

Is there anything in the website you didn't understand? If so can you tell me about it?

What were your overall thoughts about the quiz?

What did you think of the activity planner towards the end of the website?

Is there anything you would like to have seen that wasn't in the website?

Appendix 25.4 Tabulating Qualitative Feedback to Inform Intervention Modifications

Tabulating qualitative feedback from patient interviews can enable rapid, iterative analysis of whether intervention modifications are required (Bradbury et al., 2018). Table A25.4.1 shows the *person-based approach* criteria that can be used to determine whether an intervention modification is required or not. Modifications are made if they are likely to impact on behavior change (or are a precursor to behavior change). Modifications that are uncontroversial and easy to implement (e.g., spelling mistake) can be implemented immediately. It can be helpful to document where intervention modifications are in line with existing evidence or directly contradict this. Modifications might be more likely to be implemented if they are repeated by several participants, although sometimes just one participant is enough to highlight an important problem with an intervention feature that requires a modification. Potential intervention modifications are prioritized using the MoSCoW (Must have, Should have, Could have, and Won't have) criteria (shown in Table A25.4.1). Sometimes it can be unclear whether an intervention modification is needed; in these cases, it is often useful to collect further qualitative data to see what others think of the intervention feature.

Table A25.4.1 Criteria for making intervention modifications

Coding framework		
Code	Stands for	Means
IMP	Important for behavior change	This is an important change that is likely to impact behavior change or act as a precursor to behavior change (e.g. acceptability, feasibility, persuasiveness, motivation, engagement), and/or is in line with the logic model, and/or is in line with the guiding principles. For example, participants appear unconvinced by an aspect of the intervention, so you decide to add motivational examples.
EAS	Easy and uncontroversial	An easy and feasible change that does not involve any major design changes. For example, a participant was unsure of a technical term so you add a definition.
REP	Repeatedly	This was said repeatedly, by more than one participant.
EXP	Experience	This is supported by experience. Please specify what kind of experience, for example: 1. PPIs agree this would be an appropriate change. 2. Experts (e.g., clinicians on your development team) agree that this would be an appropriate change. 3. Literature: This is supported by evidence in the literature.
NCON	Does not contradict	This does not contradict experience (e.g., evidence), or the logic model, or the guiding principles.
NC	Not changed	It was decided not to make this change. Please explain why (e.g., it would not be feasible; or only one person said this).

Table A25.4.3 presents an example of qualitative feedback that has been tabulated to inform potential intervention modifications. The table includes detail on the part of the intervention that participants are referring to in their feedback, their (positive or negative) comment, a suggested intervention modification that would address any problem(s) raised, reason(s) for this change (based on the criteria for deciding when a change is needed shown in Table A25.4.1), and whether the change is agreed with the development team or not. This example is taken from the HOME BP intervention, which aims to reduce hypertension in patients with uncontrolled hypertension by enabling patients to monitor their blood pressure at home and enter their readings into a digital intervention in order to find out whether a medication change is needed to improve blood pressure control (Bradbury et al., 2018). If blood pressure remains above target for two months or more, then the patient's GP is informed, who issues a prescription for a medication change.

Table A25.4.2 Criteria for prioritizing which modifications to make (MoSCoW criterion)

Criteria	Definition
Must have	This modification must be made in order for the intervention to be effective in changing a participant's behavior (given what is currently known from the evidence base).
Should have	This modification should be made if possible as it may impact effectiveness but may be able to be delivered in a different way or is in some way less critical than a "must have."
Could have	This modification would be useful but may be less critical to behavior change than a "should have" and may only be implemented if time and resources are available.
Would like	This modification is not needed to support behavior change but could be useful if time and resources allow.

Table A25.4.3 Example of a table of intervention changes made during analysis of patient feedback on the HOME BP intervention

Page or Aspect of the Intervention	Positive Comment	Negative Comments	Possible Change	Reason for Change	Change Agree?	MoSCoW Criterion
Session 1: Page: "What do I do next to get started?" Session 2: Page: "Monitoring your BP at home" Session 2: Page: "Recording your readings"		Confusion over how often to monitor blood pressure, repeated by several participants, e.g., "So am I supposed to monitor my BP every day?"	Instructions made clearer to state "Monitor your blood pressure once a day for a week." This instruction needs to be repeated in sessions 1 and 2 as participants are forgetting between sessions.	IMP EAS REP NCON	Agreed	Must have – crucial to following the self-monitoring procedure.

Note. Content adapted from Bradbury et al. (2018).

References

Bradbury, K., Morton, K., Band, R. et al. (2018). Using the person-based approach to optimise a digital intervention for the management of hypertension. *PLoS ONE*, *13*, e0196868. https://doi.org/10.1371/journal.pone.0196868

Yardley, L., Morrison, L., Bradbury, K., & Muller, I. (2015). The person-based approach to intervention development: Application to digital health-related behavior change interventions. *Journal of Medical Internet Research*, *17*, e30. https://doi.org/10.2196/jmir.4055

Appendix 31.1 Examples of Explicit Measures of Attitudes and Behavioral Beliefs

Appendix 31.1.1: Hamilton, K., Kirkpatrick, A., Rebar, A., & Hagger, M. S. (2017). Child sun safety: Application of an Integrated Behavior Change model. *Health Psychology*, *36*, 916–926. https://doi.org/10.1037/hea0000533.

This study assessed parents' sun-protective attitudes for their young children on a semantic differential scale.

How likely is it that the following would result if you **performed sun-protective behaviors** for your child every time they go in the sun for more than 10 minutes **during the next 2 weeks**?
Please circle one number on each line.

Performing sun-protective behaviors for my child every time they go in the sun for more than 10 minutes during the next 2 weeks would be . . .

Unpleasant	1	2	3	4	5	6	7	Pleasant
Bad	1	2	3	4	5	6	7	Good
Unwise	1	2	3	4	5	6	7	Wise
Awful	1	2	3	4	5	6	7	Nice
Unfavorable	1	2	3	4	5	6	7	Favorable

The following questions will ask about your experience of *avoiding driving through floodwater*. "Floodwater" refers to a body of water covering land that is normally dry. "Avoiding driving through" refers to your decision to intentionally not drive through the floodwater. This decision must not have been influenced by the presence or direction of police, emergency personnel, or similar; or the presence of road closure signs or barriers. So, the personal experience you base your answers on should have involved both encountering floodwater and deliberating deciding not to drive through the floodwater.

1. Please list what you believe are the **advantages** of *avoiding driving through floodwater*?

2. Please list what you believe are the **disadvantages** of *avoiding driving through floodwater*?

3. Please list **anything else you associate** with *avoiding driving through floodwater?*

Appendix 31.1.2: Reyes Fernández, B., Knoll, N., Hamilton, K., & Schwarzer, R. (2016). Social-cognitive antecedents of hand washing: Action control bridges the planning-behavior gap. *Psychology and Health*, *31*, 993–1004. https://doi.org/10.1080/08870446.2016.1174236

This study assessed individuals' outcome expectancies on a Likert scale. The items started with the stem "*If I wash my hands frequently every day* . . ." and were correspondingly followed by sentence endings such as *"then I'll stay healthy most of my life"* (1 = *not at all* and 4 = *exactly true*).

Appendix 31.1.3: Hamilton, K., Price, S., Keech, J., Peden, A., & Hagger, M. S. (2018). Drivers' experiences during floods: Investigating the psychological influences underpinning decisions to avoid driving through floodwater. *International Journal of Disaster Risk Reduction*, *28*, 507–518. https://doi.org/10.1016/j.ijdrr.2017.12.013

This study investigated the modal (most frequently occurring) salient beliefs toward avoiding driving through floodwater.

Appendix 31.2 Examples of Implicit Measures of Attitudes

Appendix 31.2.1: Hagger, M. S., Trost, N., Keech, J., Chan, D. K. C., & Hamilton, K. (2017). Predicting sugar consumption: Application of an integrated dual-process, dual-phase model. *Appetite*, *116*, 147–156. https://doi.org/10.1016/j.appet.2017.04.032

This study used a single-category implicit association test as a measure of implicit attitudes toward sugar.

Appendix 31.2.2: Phipps, D. J. (2019). IAT Creator: A simplified method of creating IAT based experiments for Millisecond Software. https://doi.org/10.17605/OSF.IO/MSU2V

This software allows the researcher to create an IAT and provides the scoring algorithm.

Table A31.2.1 Example stimuli used in a single-category implicit association test to measure implicit attitudestoward sugar (Hagger et al., 2017).

Target Category Item	Positive Attribute Category Items	Negative Attribute Category Items
Sugar	Smile	War
Syrup	Love	Crime
Candy	Friend	Hate
Sucrose	Trust	Torture
Glucose	Fun	Murder
Honey	Happiness	Lies
Lolly	Relax	Disease
Caramel	Joy	Death
Bonbon	Beautiful	Horrible
Icing	Pleasure	Painful

Appendix 31.3 Sample Intervention Material Using Information Provision and Communication-Persuasion as Methods to Change Attitudes

Appendix 31.3.1: Chatzisarantis, N. L. D., & Hagger, M. S. (2005). Effects of a brief intervention based on the theory of planned behavior on leisure-time physical activity participation. *Journal of Sport and Exercise Psychology*, *27*, 470–487.

This study aimed to test the utility of a persuasive message that targeted modal salient behavioral beliefs in changing attitudes, intentions, and the physical activity behavior of young people.

Appendix 31.3.2: Hamilton, K., Peden, A., Keech, J. J, & Hagger, M. S. (2018). Changing people's attitudes and beliefs toward driving through floodwaters: Evaluation of a video infographic. *Transportation Research Part F: Traffic Psychology and Behaviour*, *53*, 50–60. https://doi.org/10.1016/j.trf.2017.12.012

This study developed an online video infographic to change individuals' attitudes toward and intentions to drive through floodwater. See www.youtube.com/watch?v=ZtlXpDBjU1Q&t=5s. An aspect of the intervention focused on giving information about the pros and cons of driving through floodwater based on previous formative research (Hamilton et al., 2016, 2018, 2019).

Appendix 31.3.3 : O'Brien, J., Hamilton, K., Williams, A. et al. (2018). Improving physical activity, pain and function in patients waiting for hip and knee arthroplasty by combining targeted exercise training with behaviour change counselling: Study protocol for a randomised controlled trial. *Trials*, *19*: 425. https://doi.org/10.1186/s13063-018-2808-z

This study outlines an exercise and behavior change counseling (ENHANCE) randomized controlled trial to assess the effectiveness of a twelve-week exercise intervention designed to improve long-term physical

Communication text targeting modal salient beliefs	*"Scientific studies have indicated that participating in vigorous physical activities outside of your PE lessons (during your leisure time) for at least 40 minutes a time, 4 days per week, helps you get fit and stay in shape. Research has also shown that by exercising regularly you can improve your physical skills (i.e., coordination, strength) and fitness levels. Experts in the area of physical activity and health have also documented that if you exercise with care, you can reduce considerably the risk of getting an injury. In addition, you can avoid feeling hot and sweaty if you exercise for an appropriate duration (i.e., 40 minutes at a time). Overall, exercising during your leisure time is great fun and worthwhile doing on a regular basis."*
Communication text targeting nonsalient beliefs	*"Scientific studies have indicated that participating in vigorous physical activities outside of your PE lessons (during your leisure time) for at least 40 minutes a time, 4 days per week, makes you look better. Research has also shown that exercising regularly helps you relax and forget about cares of daily routine. Experts in the area of physical activity and health have also documented that if you exercise with care, you can considerably reduce the risk of developing a health condition like heart disease. In addition, if you organize your time, you will discover that exercising during leisure time will not interfere with your daily routine. Overall, exercising during your leisure time helps you feel better physically and mentally and is worthwhile doing on a regular basis."*

Behaviour Change Method	Description	Target Construct	Example of Infographic Content
Provide information on consequences of behavior	Participants provided with details on the consequences of driving through floodwater	Attitudes	Presentation of statistics associated with driving through floodwater; Providing information about the uncertainty of conditions when water is covering the road and specific information about the effect of floodwater on vehicles

Session 1 Why Is Exercise Good for Me?

Osteoarthritis is a chronic joint disease that causes pain, stiffness, swelling, joint instability and muscle weakness, all of which can lead to impaired function and reduced quality of life. Exercise is recommended by all clinical guidelines for the management of osteoarthritis (Bennell & Hinman, 2013).

Osteoarthritis is the most common type of arthritis and the major cause of chronic musculoskeletal pain and mobility disability in elderly populations worldwide. In 2007, 7.8% of Australians had osteoarthritis (Bennell & Hinman, 2013). The knees, followed by the hips, are the most commonly affected weight-bearing joints.

Role of exercise in treatment of hip and knee osteoarthritis:
Regular exercise can improve impairments associated with osteoarthritis including muscle strength, joint range of motion, proprioception (perception of movement and spatial orientation), balance and cardiovascular fitness (endurance) (Bennell & Hinman, 2013). Other potential benefits of exercise for people with osteoarthritis include improvements in mobility, falls risk, body weight, mental health and a range of chronic disease.

A Successful Outcome Begins before Surgery!
While rehabilitation is essential in allowing a person to regain function and quality of life following a total joint replacement surgery, pre-surgical physical conditioning – prehabilitation, or "prehab" – can improve the healing process and help improve function following surgery.

Prehab is the process of enhancing the fitness level and functional capacity of people before surgery.

The individualized and targeted exercises you will be doing in your supervised exercise sessions in the weeks leading up to surgery will:

- Speed up your overall recovery and healing
- Strengthen the muscles that will support your new joint
- Reduce fatigue and muscle soreness
- Improve your circulation

How prehab helps
A person's level of physical fitness, muscular strength, endurance and joint range of motion have all been shown to affect outcomes after joint replacement surgery – particularly when it comes to minimizing muscle wasting and stiffness and returning to daily activities.

Prehab can benefit people in many ways:

- **Improved strength and independence.** Helps people to move independently and/or to be less reliant on assistance post-surgery.
- **Improved body awareness.** After surgery, people must re-learn everyday movements, like getting up from a chair. Prehab teaches people about better body awareness in preparation for such tasks.
- **Improved fitness level.** Enhances healing and recovery rates, improves motivation and commitment during rehabilitation.
- **Improved function.** As people report less pain, better quality of life and more confidence after prehab.

Exercise Brainstorm: What do I think about exercising?

Record and rate some of your thoughts (higher number, more important)

Exercise Advantages	Importance 1 - 10	Exercise Disadvantages	Importance 1 - 10

Do the advantages/disadvantages outweigh each other?

Session 1: Homework Task

Over the next week identify what has (1) helped you to exercise and/or (2) stopped you from exercising?

1. Exercise motivators	2. Exercise barriers

Session 1: Take Home Points

Why is doing exercise important for me?

See you next week!

activity and functional abilities for people awaiting arthroplasty. Session 1 focused on building attitudes, specifically focusing on getting individuals to think about why exercise is beneficial, the advantages/disadvantages of doing exercise, and weighing up the pros and cons to exercise. Session 1 intervention material is provided here. The full program material is provided online (see O'Brien et al., 2018).

References

Hamilton, K., Peden, A. E., Keech, J. J., & Hagger, M. S. (2019). Driving through floodwater: Exploring driver decisions through the lived experience. *International Journal of Disaster Risk Reduction*, *34*, 346–355. https://doi.org/10.1016/j.ijdrr.2018.12.019

Hamilton, K., Peden, A. E., Pearson, M., & Hagger, M. S. (2016). Stop there's water on the road! Identifying key beliefs guiding people's willingness to drive through flooded waterways. *Safety Science*, *86*, 308–314. https://doi.org/10.1016/j.ssci.2016.07.004

Hamilton, K., Price, S., Keech, J., Peden, A., & Hagger, M. S. (2018). Drivers' experiences during floods: Investigating the psychological influences underpinning decisions to avoid driving through floodwater. *International Journal of Disaster Risk Reduction*, *28*, 507–518. https://doi.org/10.1016/j.ijdrr.2017.12.013)

Appendix 31.4 Sample Intervention Material Using Strong Verses Weak Arguments as a Method to Change Attitudes

Appendix 31.4.1: Updegraff, J. A., Sherman, D. K., Luyster, F. S., & Mann, T. L. (2007). The effects of message quality and congruency on perceptions of tailored health communications. *Journal of Experimental Social Psychology*, *43*(2), 249–257. https://doi.org/10.1016/j.jesp.2006.01.007

This tailored-argument study attempted to persuade people that they should floss their teeth more; the study included an argument-quality intervention. An exemplary strong argument was "flossing eliminates bacteria that can damage the gums." An exemplary weak argument was "people report that flossing helps them develop dexterity and coordination in their fingers." The study randomly assigned message recipients to either the strong or the weak condition (not both).

Appendix 31.4.2: Betsch, C., & Sachse, K. (2013). Debunking vaccination myths: Strong risk negations can increase perceived vaccination risks. *Health Psychology*, *32*, 146–155. https://doi.org/10.1037/a0027387

This set of two experiments used persuasive communications in an effort to debunk (refute) vaccination myths. Participants were randomly assigned to receive either a stronger or a weaker set of arguments. For example, a stronger version was (translated from the original German):

The side-effects of vaccinations are unforeseeable. In recent years, it was repeatedly discussed whether autism, diabetes or even multiple sclerosis are caused by vaccination. To date, there is no evidence supporting this, but there are **numerous studies** that disprove it. (emphasis added)

In the weaker version, the boldfaced text was replaced by "**some studies**."

Appendix 31.5 Sample Intervention Material Using Cognitive Dissonance As a Method to Change Attitudes

Appendix 31.5.1:Prunty, J., & Apple, K. J. (2013). Painfully aware: The effects of dissonance on attitudes toward factory farming. *Anthrozoös*, *26*, 265–278. https://doi.org/10.2752/175303713X13636846944367

This experiment randomly assigned nonvegetarian participants to one of two conditions. In the experimental condition ("commitment condition"), throughout the study, experimenters exposed participants to the hypocritical statement: "Animals should not be made to suffer needlessly in the production of meat." They then asked whether the participants agreed with it. In the control condition, neither the statement nor the question appeared.

Appendix 31.5.2:Rubens, L., Gosling, P., Bonaiuto, M., Brisbois, X., & Moch, A. (2015). Being a hypocrite or committed while I am shopping? A comparison of the impact of two interventions on environmentally friendly behavior. *Environment and Behavior*, *47*, 3–16. https://doi.org/10.1177/0013916513482838

This experiment randomly assigned participants to either a commitment condition or a hypocrisy condition. In the hypocrisy condition, experiments asked participants to sign a pro-environmental poster and then asked them two questions concerning their habits in terms of plastic bag use, which gauges past transgressions, using a 10-point scale (0 standing for "never" and 9 for "always"). The statements were as follows: "I use shopping bags or reusable bags to bring my shopping back home" and "I use free plastic bags that I take in the supermarket to bring my shopping back home." To screen out those who did not need bags, it was made sure that participants never answered "always" to the first question and "never" to the second one. No one did. To assure that some dissonance was aroused, these measures were summarized: "I use reusable bags" yielded a mean of 3.48 (SD = 2.77) and "I use free plastic bags" yielded a mean of 7.84 (SD = 1.52). These measures confirmed that participants' past behaviors were transgressions as they did not use reusable bags often and frequently used plastic bags.

Appendix 31.5.3:Simmons, V. N., Webb, M. S., & Brandon, T. H. (2004). College-student smoking: An initial test of an experiential dissonance-enhancing intervention. *Addictive Behaviors*, *29*, 1129–1136. https://doi.org/10.1016/j.addbeh.2004.03.005

In this study, participants, who were regular smokers as well as university undergraduates, were told that the experimenters "would like their help to develop a message to persuade adolescents to quit smoking." Then, participants were provided with historical information about tobacco and were instructed to "use their own words to incorporate at least eight of the points (plus other information, if they desired) into a persuasive message targeted towards adolescent smokers." Participants were also asked to read their speech in front of a video camera to induce public commitment against smoking.

Appendix 32.1 Example of a Self-Efficacy Intervention

This intervention material contains screenshots from the "This Girl Can" campaign by Sport England (2015): www.thisgirlcan.co.uk, https://twitter.com/ThisGirlCanUK


I am acting my age.
THIS GIRL CAN


A kick right in the stereotypes.
THIS GIRL CAN


This Girl Can @ThisGirlCanUK · 1 Dec 2018
Be the star of your own #ThisGirlCan poster. You might even feature in our Twitter feed! app.thisgirlcan.co.uk
Girl. Power.
THIS GIRL CAN


One is more than none.

Appendix 32.2 Effects of Self-efficacy Interventions

Self-Efficacy Interventions: Do They Change Self-Efficacy?

Self-efficacy interventions have demonstrated small statistically significant effects for the intervention on *physical activity self-efficacy* for healthy adults (d = 0.16 – 0.26; Ashford, Edmunds, & French, 2010; M. Y. Tang et al., 2018; S. L. Williams & French, 2011) and obese individuals (d = 0.23; Olander et al., 2013). For older adults, physical activity interventions moderately increased *physical activity self-efficacy* (d = 0.37; French et al., 2014). Although often used with elite athletes to help recover from injuries, a meta-analysis on the effectiveness of mental imagery on self-efficacy found a large effect that was not statistically significant (g = 0.99; Zach et al., 2018). Health game interventions (serious games with exercise or fitness content for PC, console, or mobile) significantly increase *physical activity self-efficacy* in children; however, studies were too few and heterogeneous to calculate a pooled effect (Pakarinen et al., 2017). Dietary interventions affected *dietary self-efficacy* with a small effect (g = 0.24; Prestwich et al., 2014). Alcohol interventions for college students were found to increase knowledge, attitudes, norms, and intentions but not self-efficacy (d = 0.01; Scott- Sheldon et al., 2009). Meta-analyses in *HIV prevention* were positive to inconclusive, especially in women (Mize et al., 2002; Robinson et al., 2017). Web-based interventions showed an effect on *refusal self-efficacy* that was not statistically significant (d = 0.06), but a significant small effect on *condom self-efficacy* (d = 0.19; Noar, Pierce, & Black, 2010). A review on self-efficacy interventions to reduce *addictive behaviors* (smoking, alcohol, drug abuse) found seven out of ten studies to have significant effects on self-efficacy but could not, however, calculate an overall effect size (Hyde et al., 2008).

In *patient populations*, generic self-management interventions for patients with chronic pain showed a long-term benefit for self-efficacy that was not clinically significant (g = −0.26 favoring self-management groups; Elbers et al., 2018). Musculoskeletal rehabilitation programs developed based on social cognitive theory (SCT) were found to affect patient self-efficacy with a large effect (d = 0.98; Ghazi et al., 2018). *Balance self-efficacy* in individuals who had experienced stroke could be increased with intensive physical activity programs directly (standardized mean difference [SMD] = 0.44) and sometime after the intervention (SMD = 0.32; A. Tang et al., 2015). A meta-analysis comparing osteoarthritis self-management programs with and without exercise components showed that both formats had small-to-moderate effects on *osteoarthritis pain self-efficacy* (d = 0.20, d = 0.37; Brand et al., 2013). Nine randomized controlled trials (RCTs) comparing cognitive behavioral therapy against waiting-list control groups showed a large effect of d = 1.46 on *panic self-efficacy* (Fentz et al., 2014). RCTs using the twelve-step program by Alcoholics Anonymous increased self-efficacy by a small amount (r = 0.21; Forcehimes & Tonigan, 2008).

In the *academic setting*, learning how to read and write is essential for future academic success. In their meta-analysis, Unrau et al. (2018) found an effect of g = 0.33 for *reading self-efficacy* interventions.

As becoming a parent is challenging, several studies have investigated whether parenting and breastfeeding self-efficacy can be increased. Liyana's (2018) meta-analysis shows an overall moderate effect size of d = 0.57 including programs in groups and individuals to increase *parental self-efficacy*. Wittkowski (2016) concludes that group-

based programs differ in their effect depending on the measures used to assess parental self-efficacy (medium-to-large effects d = 0.42–1.25 for task-specific and small-to-medium effects d = 0.26–0.74 for general measures of parental self-efficacy). Two systematic reviews conclude that interventions on *breastfeeding self-efficacy* were more effective than usual maternity care (SMD = 0.40–0.86 at 4–6 weeks' follow-up) and that interventions informed by SCT were more effective than mere educational interventions (Brockway, Benzies, & Hayden, 2017; Galipeau et al., 2018).

Self-Efficacy Interventions: Do They Change Behavior and Is the Effect Mediated by Self-Efficacy?

Some reviews of self-efficacy effects also investigated whether these interventions had an effect on subsequent behavior. Significant effects were found on *physical activity* for healthy (d = 0.26; S. L. Williams & French, 2011), obese (d = 0.50; Olander et al., 2013), and older adults (d = 0.14; French et al., 2014). There is also some evidence that self-efficacy interventions increase *HIV prevention* (Mize et al., 2002; Robinson et al., 2017) and *addiction behaviors* (Hyde et al., 2008). Twelve-step programs had an effect on alcohol and drug abuse of r = 0.30 (Forcehimes & Tonigan, 2008). Self-management interventions for chronic pain showed significant effects on physical functioning and pain (both g = −0.28) but not on physical activity (g = 0.14; Elbers et al., 2018). Breastfeeding interventions overall increased breastfeeding rates (OR = 1.56; RR = 0.97; Brockway et al., 2017; Galipeau et al., 2018).

To establish whether self-efficacy mediates the effects of interventions on behavior, self-efficacy was analyzed as a mediator of the behavioral changes. There is, for example, solid evidence that self-efficacy is a mediator of most interventions to increase physical activity among children and adolescents (Lubans, Foster, & Biddle, 2008). A systematic review on physical activity *maintenance* in young adults, however, concludes that many of the interventions were not effective in changing their presumed mediators (only about 34 percent of mediator analyses were statistically significant; Murray et al., 2018). Self-efficacy was found to be related to lower substance use in those RCTs analyzing twelve-step programs by Alcoholics Anonymous (Forcehimes & Tonigan, 2008). As neither of the two studies that reported significant effects on addiction behaviors performed mediation analyses, behavior change could not reliably be attributed to self-efficacy (Hyde et al., 2008). School-based stress management programs were found to be effective for stress symptoms but not for self-efficacy in children (d = 0.03; Kraag et al., 2006). Panic self-efficacy was found to mediate intervention effects on panic severity (Fentz et al., 2014).

Self-Efficacy Interventions: What Makes Them Effective?

Even more informative for intervention developers than estimates of *whether* self-efficacy interventions work are systematic reviews trying to extract those behavior change techniques (BCTs) that explain *why* self-efficacy interventions are effective for specific domains of behavior change and specific populations. Although it would be desirable to be able to give universal guidance on which intervention techniques are most effective to increase self-efficacy in general, trying to find *the best* method for all behaviors and all populations would result in recommendations less useful for each specific context. Chapter 32, therefore, focuses on reviewing different BCTs that may be effective for different populations and different behavioral domains.

Bandura (1997) suggested that mastery experience is the most effective source, followed by vicarious experience, verbal persuasion, and physiological feedback. From observational studies in different behavioral domains (foremost research on academic self-efficacy), mastery experiences or past performance indeed consistently emerges as the strongest predictor of self-efficacy beliefs (S. L. Anderson & Betz, 2001; Britner, 2008; Byars-Winston et al., 2017; Lent, Lopez, & Bieschke,

1991; Morris, Usher, & Chen, 2017; Schunk, 2003; Usher & Pajares, 2008; Van Vianen, 1999; Warner et al., 2014). However, the relative importance of the sources seems to depend on which kind of behavior is investigated, as, for example, for *job* and *coming-out self-efficacy* (self-efficacy for disclosing one's homosexuality) mastery experiences were less important than other sources (M. K. Anderson & Mavis, 1996; Chiles & Zorn, 1995).

In studies summarizing the effects of RCTs, which targeted at least two sources of self-efficacy in their intervention material, fostering mastery experiences was found to be the most effective source of self-efficacy for *students in different school majors* (Usher & Pajares, 2008). For *reading comprehension self-efficacy*, Unrau's review indicates that intervention effects become larger as the number of sources of self-efficacy included increases (one source $g = 0.16$, two sources $g = 0.24$, three sources $g = 0.55$). However, no single source could be identified as the active ingredient (Unrau et al., 2018).

A systematic review using a coding frame derived from SCT for categorizing physical activity interventions came to the conclusion that interventions including *feedback on past or others' performance* and *vicarious experience* produced higher levels of self-efficacy, whereas *persuasion*, *graded mastery*, and *barrier identification* were associated with lower self-efficacy (Ashford et al., 2010). Three further systematic reviews used the BCT taxonomy by Abraham and Michie (2008): *Action planning*, *provide instruction*, and *reinforcing effort towards behavior* were associated with higher self-efficacy, whereas the BCT's *relapse prevention* and *setting graded tasks* were associated with lower self-efficacy in healthy adults (S. L. Williams & French, 2011). In obese individuals, *action planning*, *time management*, *prompting self-monitoring of behavioral outcome*, and *planning social support/social change* were significantly associated with positive changes in physical activity self-efficacy, whereas *setting graded tasks* and *prompting generalization of a target behavior* reduced self-efficacy (Olander et al., 2013). Several BCTs effective in physical activity interventions for younger adults produced detrimental effects for older adults (more than sixty years old). These BCTs include *setting behavioral goals*, *prompting self-monitoring of behavior*, *planning for relapses*, *providing normative information*, and *providing feedback on performance*. On the contrary, *setting graded tasks*, *prompting self-monitoring of behavioral outcome*, *providing information on where and when to perform the behavior*, and *motivational interviewing* were positively associated with intervention effects on physical activity self-efficacy in older adults (French et al., 2014).

Interventions inducing positive attitudes and teaching behavioral skills ($d = 0.45$; Albarracín et al., 2003) as well as self-management behavior skills trainings ($d = 0.29$; Albarracín et al., 2005) were especially effective in increasing control beliefs for condom use.

A systematic review using the behavior change technique taxonomy version 1 (BCTTv1; Michie et al., 2013) concludes interventions with more BCTs are more effective at maintaining changes in self-efficacy for physical activity. This review did not, however, find specific BCT combinations to be especially effective (M. Y. Tang et al., 2018). Self-efficacy for *healthy eating* was found to be effectively increased by interventions including the BCT *stress management* and found some evidence for the BCTs *self-monitoring*, *feedback on performance*, *prompting review of behavioral goals*, *providing contingent rewards* (rewarding diet success), or *planning for social support/social change* (BCT taxonomy according to Abraham & Michie 2008; Prestwich et al., 2014). Especially the combination of *stress management* with the BCTs *model/demonstrate the behavior* and *prompting practice* showed to be effective in this meta-analysis (Prestwich et al., 2014).

Despite evidence from several systematic reviews within the health domain, these did not provide a strong evidence for Bandura's suggested sources as they incorporate various interventions, not only interventions designed to test SCT or programs

targeting specific sources of self-efficacy. The strongest test for which sources or BCTs lead to the largest changes in self-efficacy would be factorial study designs testing different sources of self-efficacy directly against one another. To read more about the development and evaluation of complex interventions, see the Medical Research Council Guidelines (Craig et al., 2008). Such experimental studies are, however, almost nonexistent to very scarce depending on the behavioral domain under study. One study that investigated different combinations of self-efficacy sources found that mastery experience was effective no matter whether it was accompanied by another source but that verbal persuasion was only effective if preceded by mastery of the physical task (bench pressing) to increase *bench press self-efficacy* in women (Wise & Trunnell, 2001). A quasi-experimental study to increase *teacher self-efficacy* for using a new teaching method tested four combinations of BCTs: (1) information; (2) information + modeling; (3) information + modeling + practice; (4) information + modeling + practice + coaching (Tschannen-Moran & McMaster, 2009). Surprisingly, the results indicate that targeting more sources is not always better but that a number of teachers reported dips in self-efficacy in the second and third condition, while the first and fourth group increased self-efficacy.

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Appendix 32.3 Further Example of a Self-Efficacy Intervention

This intervention material is a translation from Finnish and was used for the following study: Aro, T., Viholainen, H., Koponen, T. et al. (2018). Can reading fluency and self-efficacy of reading fluency be enhanced with an intervention targeting the sources of self-efficacy?*Learning and Individual Differences*, *67*, 53–66. https://doi.org/10.1016/j.lindif.2018.06.009

Table A32.3.1 Intervention structure: computer-based fluency training and weekly group session

Aspect of Intervention	Time Spent	Intervention Content
Weekly computer-based individual fluency training	10–15 minutes three times per week	Computer programs enhancing fluency (supervised by special education teacher, regular classroom teacher, or school assistant)
Weekly group-sessions to foster fluency and self-efficacy	5 minutes	Welcome and orienting and emotion checklist
	15–20 minutes	Feedback from last week's outcome and effort
	15–20 minutes	Text reading and feedback on progress
	5 minutes	Cleaning up, filling out emotion checklist and attendance passport

Table A32.3.2 Sources of self-efficacy provided during the weekly group sessions

Source of Self-Efficacy	Intervention Content
Mastery experience	• Reachable challenges with exercises adapting to each child's skills. • Individual concrete visual feedback provided by the computer programs (see Figure A32.3.1) and on time used for practicing and read items (i.e., reading speed development and a proportional number of mistakes). • Individual concrete visual feedback on improvement in text reading (i.e., graphs indicating reading speed development, Figure A32.3.2). • Individual concrete feedback on working habits and effort during and after each group session and weekly individual computer-based sessions (e.g., graphs on time used for practice, see Figure A32.3.23, and discussions based on the graphs).
Vicarious experience	• Exercises in peer group with a similar skill level • Mastery models observing peers and focusing on good performance and improvement of peers. For instance, in the manual, teachers were encouraged/guided to target children's attention to observing peers' successes and accomplishments, and instructed to encourage children to give feedback and to encourage peers. In addition, teachers were also guided to help children to compare their performances to their own previous performances, not to performance or improvements of other children.

Continued

Table A32.3.2 Cont.

Source of Self-Efficacy	Intervention Content
Verbal persuasion	• Systematic feedback on development and effort verbalized by teacher. • Directing child's attention to his or her own improvement and recognizing it. • Feedback was given from improvement connected to ability to learn, e.g., "*Today you read more words than last time, and that shows me that your reading speed has improved."* Teacher shows child's own development curve of reading (see Figure A32.3.1). • Feedback was given from improvement associated with effort, e.g., "*See, how much you have practiced! Great! Practicing makes you a more fluent reader. As you see, today you read more words than last time.*" Teacher shows child's own development curve of reading (see Figure A32.3.2). • Feedback was given from persistence connected to ability to learn, e.g., *"Today you read lot. Great!," "It seems to me that persistent practicing helps you to learn," "See, today you read more words than last time."*
Affective reactions	• Naming of affective state, discussions on emotions concerning learning, and self-ratings of willingness to practice. At the end of the group session short stories telling about mishaps, accomplishments, and emotions of children with difficulties in learning. The happenings and the feeling of the characters were discussed with the children. • The children's own observations and comments on their reading performance, emotions, and practice were encouraged, e.g., "I kept on going although the text was difficult"; "*Last week I was tired and did not practice so much.*" • Mistakes and setbacks accepted and allowed in a positive atmosphere. • Filling the emotional checklist (see Figure A32.3.4) in the beginning and at the end of the session.

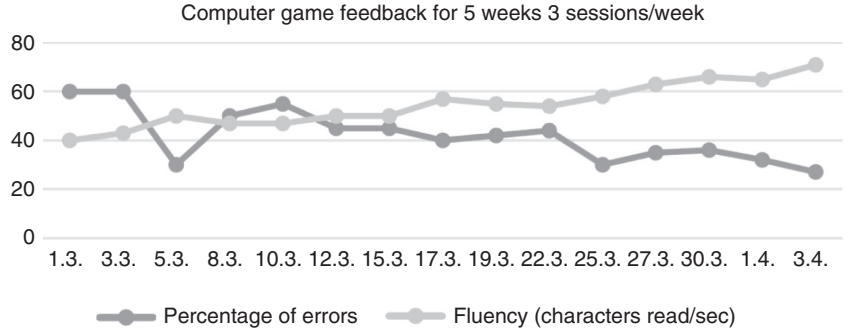
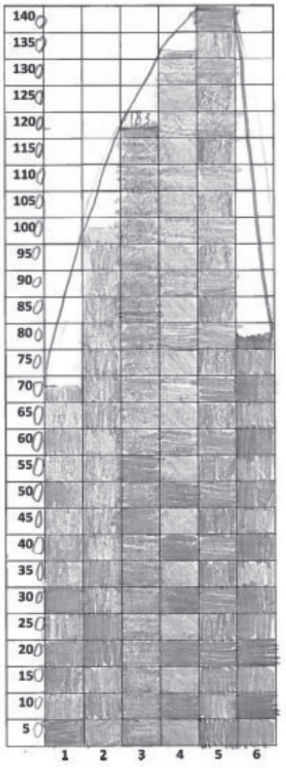
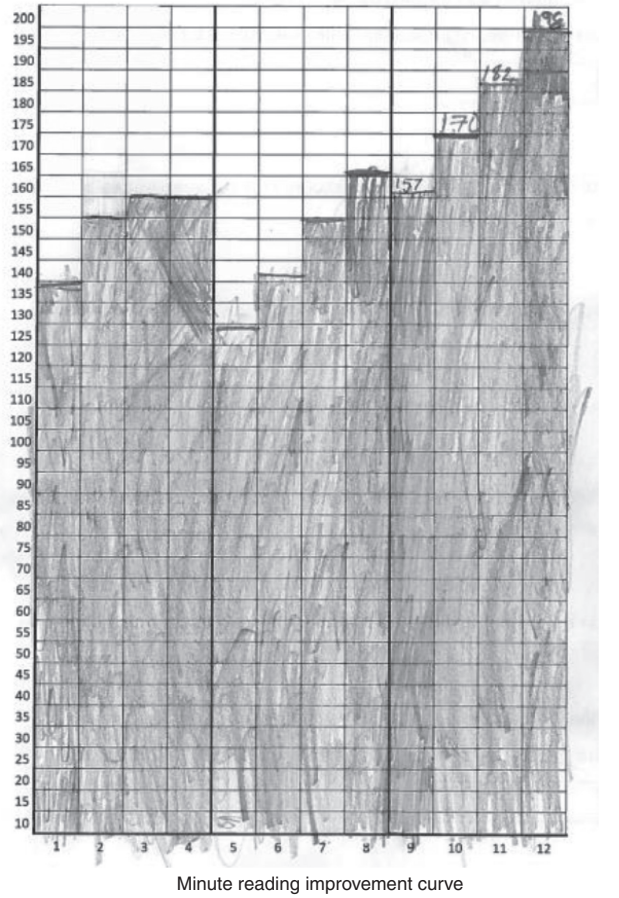


Figure A32.3.1 Graph indicating reading speed development and a proportional number of mistakes in the computer game during 15 consecutive individual practice sessions (10–15 minutes, 3 times/week)



To become fluent: How much did you read? Indicate by coloring how many syllables, words, or sentences you read.
1 square = 5 syllables, words, or sentences



Minute reading improvement curve

Figure A32.3.2 Graphs made by the child indicating reading improvement
The minute reading improvement curve indicates the number of words read during the exercise. The same text was read in four consecutive sessions, after which reading of a new text was started

My own success

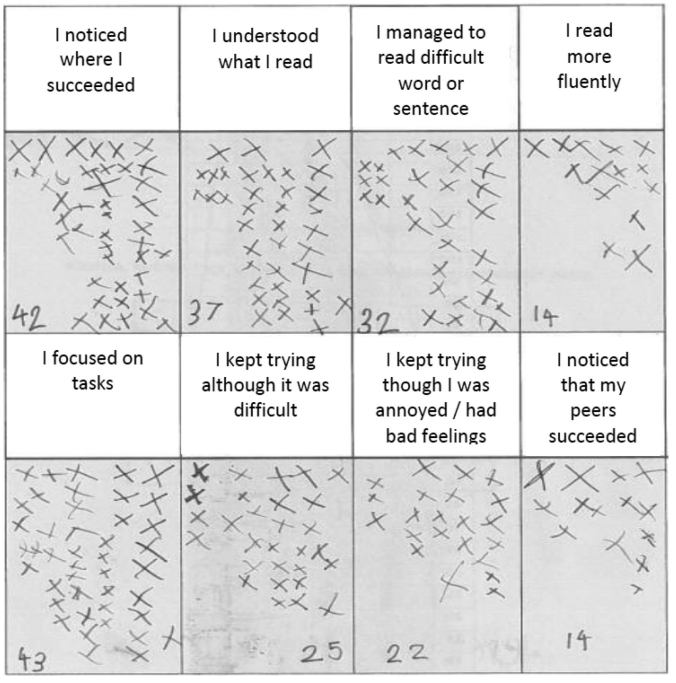


Figure A32.3.3 Working habits: success and accomplishments

How willing you are to practice today?

Color 1–5 squares to indicate how willing you are

How willing you were in your practicing today?

Color 1–5 squares to indicate how eager/willing you were today

Figure A32.3.4 Working on emotion recognition
The upper squares were colored at the beginning of the weekly session and the lower one at the end of the session.

Appendix 32.4 Another Intervention Example for Self-efficacy Intervention

This intervention material was used in the following study:Nichols, J., Schutte, N. S., Brown, R. F., Dennis, C.-L., & Price, I. (2009). The impact of a self-efficacy intervention on short-term breast-feeding outcomes. *Health Education and Behavior*, *36*, 250–258. https://doi.org/10.1177/1090198107303362

Exploring Aspects of Confidence

About this workbook:

Even though breastfeeding is a natural function, it is also a task that can be learnt. There are lots of factors that contribute to whether, or how long, a mother breastfeeds her baby. One of these factors is a mother's confidence in her ability to breastfeed. The following material can help you explore some aspects related to this confidence, as well as give you an opportunity to learn some new skills and therefore make choices. Take as much time as you need to think carefully about each question, there are no right or wrong answers, and your answers are for your own unique benefit. This workbook will need to be sent back to the researcher to ensure this stage of the study has been completed, however you are encouraged to photocopy the workbook to be able to look back over your answers on a regular basis. While you are pregnant is a good time to prepare yourself for breastfeeding, your answers in this workbook will be of most benefit to you when you are actually breastfeeding your baby. Keep it handy and refer back to it especially if you encounter difficulties.

Mastery

When we become good at something we say we have "mastered" that task, mastery can relate to anything we can do consistently with confidence.

Our past experiences can guide and influence the way we approach future challenges.

Think of a practical task or skill (the more recent the better) that you have found challenging but have persevered with and eventually mastered. For example:

- Driving a car
- Playing a game
- Playing a musical instrument
- Reaching a destination after having to find your way

What was the task?

.....

What thoughts did you have about being able to accomplish this task when you were first learning it?

I thought .....

How did these thoughts help, or hinder your first attempts?

.....

How did you feel about being able to accomplish this task when you were first learning it?

I felt .....

How did these feelings help, or hinder your first attempts?

.....

What were some of the other things that helped you master this task?
e.g., being interested, having support

.....

Look over your responses to the above questions, and think about how you could incorporate some of the things that have helped you accomplish a task in the past. Write yourself a list of the things that you know will help you with the task of breastfeeding.

1. .....

2. .....

3. .....

4. .....

Building Confidence by Learning from Others

Testimonials from mothers' breastfeeding experiences.

Following are some experiences written by other mums who are still breastfeeding telling how it was for them, it may help to read about the difficulties other mums have experienced and how they have overcome them.

Testimonial 1

The hardest part of breastfeeding my daughter was in the first 3 months, at the worst of it I became paranoid that she just wasn't getting enough milk, she seemed to never be filled up and always at the breast, it became a bit exhausting and I started to doubt my milk supply and I suppose myself. My mother who had been so supportive of my decision to breastfeed, even though she didn't breastfeed us kids herself, used to say "you given her long enough now, its would be easier to put her on the bottle." I know now that she meant well, and hated seeing me go though any sort of discomfort as mother do, and she did cop the brunt of my letting of steam. I didn't really want to put my baby on formula, and she was putting on weight and hadn't had any colds or gastro bugs at 8 weeks as other bottle-fed babies we knew had at this age. I also knew I would miss waking up to feed her and snuggling in with her with both of us falling asleep after her feed. I found out since, that the demanding more feeds thing was her way of increasing my milk supply, because she was going through a growth spurt, Im glad I had the support other mums who knew about breastfeeding 'cause I hate reading books. Looking back Im glad I hung in there with breastfeeding, I look at her now at 13 months old and think, "I did that! Breastfeeding is 'our time', she really is amazing, and it's all worth it.

Rachel, Sunshine Coast

Testimonial 2

The best kept secret is how hard it is. I thought breastfeeding would be easier this actually undermined my confidence. The problem was bub wouldn't suck or open her mouth, apparently, she sucked her fingers in utero. The midwife helped me in hospital, but when I came home at 3 days, my milk came in and I started to use a nipple shield. I felt useless as things weren't going well. I also felt helpless. The whole thing was a huge confidence demeanour I wanted to give up trying but there was this thing in me that said that when I start to bottle-feed I can't go back. Clinics I attended didn't help. I rang Australian Breastfeeding Association and they sent me a lactation consultant's brochure. I contacted a LC who encouraged me to continue. She OK'ed the use of the nipple shield and supported my decision. I am so glad I persevered. I love the contact with my baby. She is growing and I'm responsible for that. It keeps the miracle – from inside to outside. In my ultrasound picture she is 1.1 cm long, and here she is at almost 4 months, 7.5 kg, (and I'm still using the nipple shield)

Ellen, Logan Reserve

Testimonial 3

The trouble I had with attachment. I thought everything was all wrong, as I was sure I knew what was supposed to happen. The midwifes told me it was OK and that things would improve, which it did, after cracking and bruising. Everything looked OK but bub pinched the end of my nipple at each feeding, resulting in cracks and painful attachment. This happened at the beginning of each feed. It stressed me out and I wasn't getting very much sleep. I felt I should trust my own instincts rather than what other people were telling me. I never planned on giving up breastfeeding so I kept on trying – it seemed to come good in the end. I just persisted, at each feeding I tried to make sure there was enough breast in her mouth. A midwife rang everyday for 10 days, and she would discuss any of my concerns. My mum also supported me. My baby is getting breast milk and I love the time we spend together. It's great knowing she gets all she needs from me, that she's gaining weight well and doing well.

Erin, Beenleigh

Testimonial 4

It was difficult not knowing how much milk she was getting, the weight gain and how much these can fluctuate. My breast went from fullness to not fullness, leaking to not leaking, and it was difficult not being able to see the amount she was taking. I felt anxious and at times inadequate. I had a Depo Provera shot when she was 3 weeks old and that's when the fluctuations started. That was when my concerns really started at this stage formula sounded good. I read heaps and expressed. I had contact with ABA and regular contact with my child health nurse, who encouraged me to continue breastfeeding even though her weight gains weren't great at times. The rewards are bond we have, and she is a bright and happy baby. She is growing well and reaching her milestones, all this is happening and I'm really responsible for it. At the end of the day, I go to bed happy that she's happy.

Renee, Marsden

Utilizing Encouragement

Sometimes all we need is a little encouragement to get us through, supportive words such as "you've done so well, keep it up," "I know you can do it," can give us the support when we need it most. Unfortunately, others don't often know when we need it most, *unless we tell them*. Now, while you are pregnant is a great opportunity to talk to your partner and family about how they can support you

breastfeeding, and even ask them for their support. The easiest way someone can support you in breastfeeding is to give you verbal encouragement,

. . . Ok, then imagine if your partner or best friend had been battling through with a problem for a few weeks now and were becoming more and more depressed and distant. Eventually you find out that they had felt bad or uncomfortable about asking for your support, how would you feel? This may be how others feel toward helping you. We tend to underestimate how good it can allow others feel by allowing them to support us, not allowing them to help is like refusing a gift. By telling those closest to us what we do and don't need, we also foster better communication towards everyone's needs being met. Also, if those closest to us know what we really want and need they can support us accordingly.

Write down the sort of things that your mother/partner/friend *might* say that would **not** be helpful to you when your breastfeeding?

1. .....

2. .....

3. .....

4. .....

Write down the sort of things that your mother/partner/friend ***could*** say that would not be helpful to you when your breastfeeding?

1. .....

2. .....

3. .....

4. .....

Maybe you could brainstorm some verbal encouragers with your mother/partner/friend

You can also give yourself verbal encouragement!

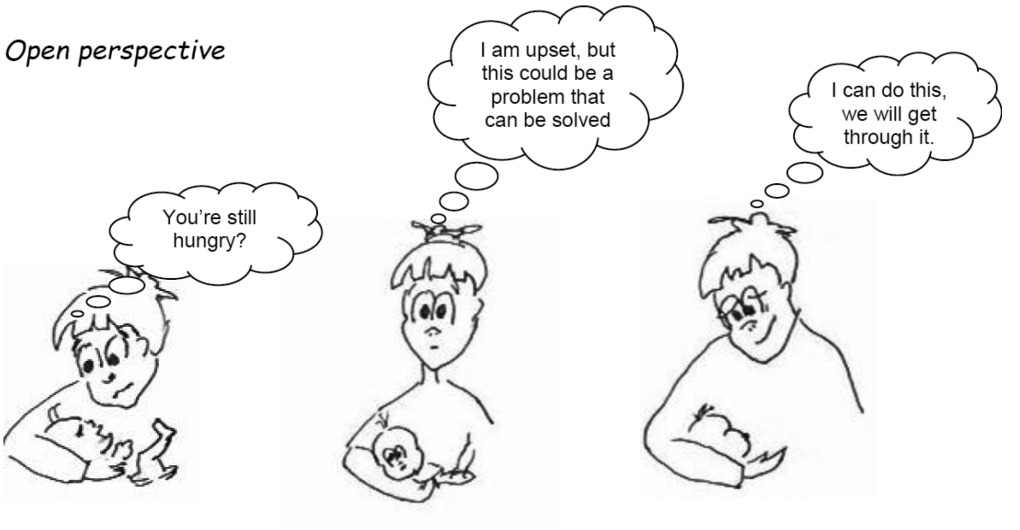
Exploring How We Respond to Stress

Breastfeeding like other tasks that we learn and do, will not always be easy. Just coping with getting started, and continuing breastfeeding can be very stressful to some new mums since establishing breastfeeding can take some time, effort and most of all perseverance. Difficulties that can occur during breastfeeding can play havoc with our emotions, and may just add to other stress in our lives at the time. This can leave us feeling stressed, frustrated and sometimes tearful, and worst of all can lead to self-doubt. These are times when our confidence in our ability to breastfeed will be challenged the most. Even though we might not have control over the events that happen to us, we do have control over how we perceive what happens to us, in other words, we might not be able to change the situation but we can change how we think and feel, toward the situation. This can also have a powerful effect on the situation in turn, for example,

This new mum has responded to this stressful situation by doubting her self as the problem, these self doubts can leave her feeling powerless to check-out if there is a real problem. Self-talk can be convincing, and if it goes unchecked can induce a negative spiral toward giving in.

This new mum begins to challenging these self-doubts:

Open perspective



Examples of questions that could be asked by this mum in this situation

1. Is my baby gaining weight?
2. Is my baby wetting/soiling enough nappies?
3. Is my milk not letting down because I'm tense and not relaxing?
4. Is my baby latched on correctly?
5. How are my confidence levels?

What do I need to solve this problem?

Do I need some help? Support? Information? A cuddle? Some encouraging self-talk?

How's Your Self-Talk?

Think of a recent event that you had a negative emotion toward (frustrated, angry, confused etc.) . . . try to recall how you were thinking and even individual thoughts . . .

Did this thinking help or hinder how you felt?

.....

Did this thinking help how you handled, or dealt with the situation?

Yes / No
(Circle one)

Can you think of an alternative thought, one that might have helped change how you looked at the situation, and made it easier to cope?

.....

It's OK to Go There but Be Careful Not to Stay There

Negative thoughts and feelings such as disappointment, frustration, anger, can take us to a place where we sometimes need to go. It's important not to deny ourselves these feelings, they need acknowledgement before we can truly move on, ("yes I'm frustrated," "I'm so disappointed"). Going there is ok, however, sometimes we get stuck there for longer than we need to be, bringing self-defeating consequences to our initial aims.

This is where positive encouraging self-talk can be used purposely to bring us back on track, for example "I can do this," "I'm not superwoman, but I am a good mother," "Hey!, I'm human and I'm doing my best," "I really am doing OK!."

Write down a list of your own encouraging and positive self-talk in sentences and phrases that you can use when you catch yourself using negative or unhelpful self-talk if you experience difficult times during breastfeeding.

1. .....

2. .....

3. .....

4. .....

Over the next few days listen to your self-talk, even try keeping a diary of what thoughts go with your emotions and how this affects your confidence and your ability to stay with rational and solve problems.

Keeping Motivated

Write a list of all the reasons you choose to breastfeed your baby. You might include lots of health benefits for your baby. You might also include any other benefits you can think of or know about, for example: "I want to regain my figure quicker," "don't want the hassle of preparing bottles," "breast milk is mobile, I have more freedom without worrying about how to warm bottles" "breast milk is free!," etc.

1. .....
2. .....
3. .....
4. .....
5. .....
6. .....
7. .....
8. .....
9. .....
10. .....
11. .....
12. .....
13. .....
14. .....
15. .....
16. .....

(Use more paper if you need to. If you are finding it difficult to find reasons, books on breastfeeding from the library may provide you with more ideas.)

If you experience difficulties, or just feel your motivation is low, and feel like giving up breastfeeding, the list you have made above is a valuable resource to return to and read.

Thank you for participating in this study. I hope you have enjoyed the material. It is now vital to the study that this workbook be posted back to the researcher, in the stamped addressed envelope provided (within 14 days of receiving it). You are however very welcome to make, and keep a copy.

Appendix 33 Imagery, Visualization, and Mental Simulation Supplemental Materials

These materials provide examples of scripts from interventions adopting imagery techniques (Appendix 33.1) and measures used to tap psychological factors expected to change as a result of the imagery interventions (Appendix 33.2). It is important to note the key features of the scripts, their structure, and the functional aspects rather than the specific target behavior or content. The scripts are open-source and can be adapted for use in other contexts and amended to focus on different behaviors. They should therefore be considered templates for future imagery interventions.

Appendix 33.1 Example "Scripts" for Imagery Interventions

Example 1: A Guided Imagery Intervention for Studying Behavior

I am going to guide you through a series of mental imagery exercises to help you achieve your goal of studying hard for your upcoming exam. In the exercises you will be asked to visualize several scenes in your mind. We will first embark on a general' imagery exercise to get you used to the idea and how it feels. We will then turn to using the exercises to achieve your goal.

First, I would like you to make yourself comfortable. Perhaps find a comfortable chair or place to lie down, in a place that is quiet and free from distractions.

When doing mental imagery, people often find it useful to close their eyes.

So, now, let's begin. The first exercise is to prepare you for the mental imagery exercise ahead. The idea is for you to just relax and visualize the image as I talk you through it.

So imagine this scene. You are in your kitchen. In front of you there is a chopping board and a sharp knife. On the chopping board is a large, round, ripe, bright yellow lemon. Look closely at the lemon.

5 sec pause

Pick up the lemon. Feel the lightly pitted texture of the peel, the vividness of the yellow of its color, and the strong, tangy lemon smell. You rub the lemon gently with your fingers, and that causes the smell to grow stronger. The smell transfers to your fingers as you rub it. Hold it up to the light and look at it for a moment. Notice its color and texture.

5 sec pause

Now, put the lemon back on the chopping board. Pick up the knife and imagine yourself cutting the lemon down the middle. Feel the pressure of knife handle on your hand as you cut into the lemon. See the juice burst out of the lemon, and cascade on to the board. Smell the intensity of the smell of the lemon juice.

5 sec pause

Pick up one half of the lemon, notice the familiar pattern of the segments as you look at the cut half. Notice the seeds and the stickiness of the lemon juice spilling on to your fingers. Move the lemon half closer to your nose and smell the sharp, tart scent of the lemon at its highest intensity. Breath in a few times.

5 sec pause

Now, gently touch the tip of your tongue on lemon, taste the sharp, sourness of its juice, that makes you recoil slightly. You can feel your salivary glands activating. Go in again for another taste. Again you feel the tartness of the juice, but this time the taste is for longer. You feel your taste buds enlivened by the intensity of the taste. Feel the saliva in your mouth moving forward as you taste the lemon again.

5 sec pause

Ok, pause there. You can open your eyes if you want, but just stay relaxed. That completes the

first exercise. The idea was to get you used to imagining a scene with great intensity. This will help you in the next exercise. How did that make you feel? Can you describe your experience?

Await response from participant

Often imagery is quite challenging for many people. The aim of this exercise was to familiarize you with how to use imagery. The idea is to actually feel you are there, "in the moment," and to use all your senses.

5 sec pause

Ok, are you ready? This time we are going to the imagery to help you study for your exam. Let's begin.

Now imagine you are at your desk at home. You are seated comfortably, there is good light, not too bright, not too dark. You have your books in front of you, your notes from class and course materials, and a pen and a pad of paper. Imagine opening your book and reading through the first chapter. You don't feel pressure, you just read through and take it in. You feel confident, and the reading is easy, not effortful. And you feel yourself taking in the information, you remember it from class, and you feel good assimilating the information. You pride yourself in taking in the knowledge and feel good that you are expanding your knowledge.

5 sec pause

Now pick up your pen. Feel the weight of it in your hand. You begin writing, summarizing what you have just read. Feel and hear the light scratch of the pen on the page as your write, it's smooth and flowing. You feel empowered by the knowledge you have acquired and confident that you are progressing.

5 sec pause

Sit back and look at the writing on the page. You feel you are making excellent progress. Things are moving swiftly, and you feel a growing confidence and sensation of capability for your upcoming exam.

5 sec pause

Now imagine yourself in the days leading up to your exam. Imagine that you have put in many hours studying and feel very pleased that you have gained the knowledge you need to write your exam. Your writing has been flowing nicely. You have reviewed your course materials and questions, and feel on top of your work. Imaging yourself back at your desk, look at all the notes you have written on your note pad. Flick through them, you realise all the work and effort you have put in, but you have enjoyed the process of taking in all this knowledge. You feel very prepared and confident. You feel you really want to take the exam now, and can see yourself writing clear, knowledgeable answers to the questions.

5 sec pause

Now see yourself on the day of the exam. Naturally, you are nervous. You feel butterflies in your stomach and have a dry mouth. But you say to yourself that this is only natural, and it's going to help you. You will use your anxiety to energize and motivate you to do your very best. You know this because you have put in all the work and you are confident you can answer all the questions well. Picture yourself outside the exam hall. Imagine how you feel. You have everything ready, your pens, your calculator, and all the knowledge you need is in your head. You know you are going to do your very best.

5 sec pause

Now imagine yourself in the exam hall. You are surrounded by other students, but you put them out of your mind. Your only focus is the exam. The examiner starts the exam and you eagerly but calmly turn the exam paper over. You find you can answer all of the questions, and you calmly start to write, just as you have for many hours in at your desk at home. Some of the questions require a lot of thought, but you had anticipated this, and it does not phase you, you are able to access all the information you need from your memory. The studying and meticulous preparation has really paid off.

5 sec pause

You write with clarity and assuredness, it comes naturally to you, as you knew it would from your preparation. Think about you moving through the exam paper with great conference, drawing efficiently from your preparation and knowledge.

5 sec pause

Now imagine you have finished the exam. You timed it to perfection and you leave the exam hall and even though you are tired, you feel exhilarated safe in the knowledge that you did well. All you want to do it talk about it with your friends. You feel an overwhelming sense of relief, satisfaction, and accomplishment. You look back over your preparation and you realize that you did this.

5 sec pause

Now imagine the day comes when you receive your results. You are delighted to get the grade you wanted, and can't stop smiling. Imagine how you would feel, the satisfaction and sense of achievement. You reflect on your experience of studying for the exam, and know that while it was hard work, it was well worth it. You also feel you have grown stronger and gained a lot from the experience. You can draw a lot of confidence in your studies going forward.

5 sec pause

Now take a moment to reflect on that image. Take a few deep breaths, and open your eyes.

This completes the imagery exercise. How did it feel? Please take 2–3 minutes to write down anything that comes to mind from the imagery exercise.

Produces note pad and pen

Were your images clear? Did you really feel in the situation, the moment, when studying for and writing the exam? What were the most emotional moments?

Give sufficient time for client to complete their written narrative. Collect pad and pen

Thank you. Now, in the next few weeks before your exam as you study, I recommend you take a few moments every few days to perform this visualization exercise again. It is important to actually see yourself studying and writing the exam. Remember how you did it here, and try to copy it. It will only take a few minutes, but you will find it will give you confidence and assuredness toward your studying going forward.

Example 2: Process Mental Simulation Exercise for Physical Activity Promotion (Meslot et al., 2016)

The World Health Organization (WHO) recommends that adults aged 18–64, should do at least 150 minutes of **moderate** physical activity per

week or at least 75 minutes of **vigorous** physical activity or a combination of both.

Moderate and **vigorous** activity includes leisure-time physical activity (walking, dancing, gardening, hiking, swimming), transportation (walking or cycling), occupational (hard physical work), household chores, playing games, or doing sports or planned exercise (aerobics, circuit training).

We would like you to try to set a **goal** to achieve this level of exercise so that you manage to do the recommended levels of activity per week. This amounts to about 20 minutes of moderate or vigorous physical activity per day. We suggest you do this progressively over the next three months. Think about the **types of activity** you would be able to and like to do, and **how** you might do your activities.

To help you do this we ask you to take **5 minutes** of your time to complete this very **simple mental exercise**.

EXERCISE:

You are more likely to carry out your **physical activity goal** if you make a decision about where and when you will do so and **imagine** doing it. Decide now when and how you will do physical activity over the following weeks, what activity or activities you plan on doing, and how you will go about doing so. You may find it useful do your activity just before or just after something else that you do regularly, such as going to work, eating dinner, or going for lunch.

Now close your eyes and **visualize** carefully and in great detail your exercise plans. Think of the things you will need to do: the **equipment** you will need, what you will need to bring with you, **who** you will need to tell, **how** you will get there, what the **environment** will look like, how you will be **dressed**, what it will **feel like** doing the activity, and **how you will** feel afterwards. It is important that that you actually see yourself doing your exercise. It is important that it is very detailed.

Now, write some **brief notes** on what you imagined on the lines below. This will help you remember what you imagined and help you achieve your goal.

_____

_____

_____

Example 3: Outcome Mental Simulation Exercise for Physical Activity Promotion (Koka & Hagger, 2017)

"MENTAL SIMULATION" EXERCISE

Think about the exercise goal that you have just decided on. Visualise yourself having achieved that goal. You have put a lot of effort into the achievement of your task and you have finally accomplished it.

Imagine the effort you have made. See yourself standing at the point of success from where you look back on the work you did to get there. Imagine how your life is different since you started exercising regularly. Visualise the changes that resulted from the accomplishment of this goal. How does it feel to have started a new lifestyle that is good for you?

Picture your life as it is now. Concentrate the on the feelings that you have when you do something that is really good for you. Visualise the satisfaction you feel at having achieved your goal. Picture the pride you feel, the confidence you feel in yourself, knowing you were successful. Try to feel the satisfaction you have with this accomplishment. Feel how proud and confident you are.

Think about you daily routine. What does your day look like, now that exercising is a firm part of it? Imagine a typical day and see yourself engaging in your new exercise routine.

See yourself standing at the point of success. Picture yourself thinking back to when you

started working on your goal. How do you feel having successfully accomplished what you wanted?

Concentrate on the energy that your healthier lifestyle contributes to your life. How does it feel to have more energy, more confidence, and to know that you successfully started a new healthier lifestyle?

Example 4: Imagery Intervention Script to Increase Fruit and Vegetable Intake (Knäuper et al., 2011)

National guidelines suggest that people should eat at least half the proportion of their food as fruit and/or vegetables.

We are asking you to try to achieve this goal in your everyday diet over the next four weeks.

The next exercise will help you to achieve your goal.

In this exercise you are asked to visualize yourself eating at least half the proportion of your food as fruit and/or vegetables. From today and for the next four weeks, think carefully about how you would go about changing your diet so that you include enough fruit and vegetables so that at least half the proportion of your food is fruit and vegetables. Imagine the steps you would need to take to make sure that half of your food is taken as fruit and vegetables. It is very important that you see actually see yourself changing your diet so that half your food comprises fruit and vegetables and have that picture in your mind.

Now spend about 5 minutes, imagining those steps. Think about all the things you would need to do in order to achieve your goal and think about all the things you would need to overcome. You will find that it might help to close your eyes when doing your visualization.

Now you have finished your visualization, please write down a few sentences summarising the things you imagined you need to do to take half of your food as fruit and vegetables in the next 4 weeks. Please use the lines printed below. You should aim to make your writing as detailed as possible. These thoughts are personal, so write down for your eyes only. Spend about 5 minutes writing down your thoughts.

_____

_____

_____

_____

Example 5: Combined Outcome and Process Mental Simulation Exercise for Smoking Cessation

Everyone knows that smoking can cause serious harm and lead to many long term and possibly fatal illnesses. More than 22 percent of the population are smokers, and you are one of them. But you have made the first, very important step in the journey to become a non-smoker. So your long-term goal from today should be to quit smoking altogether for six months, you will then be considered a "non-smoker." Along the way you will be faced with many obstacles, but with perseverance, willpower, and a lot of help from us and your friends and family you can do it, one step at a time.

The best way to get started is to set a short-term goal over the next four weeks. You should aim to stop smoking cigarettes for four weeks, it's a challenging goal, but realistic and achievable for most smokers.

The next exercise will help you to achieve your goal.

In this exercise you are asked to visualize yourself smoking no cigarettes each day. From today and for the next four weeks, think carefully about how you would go about changing your lifestyle so that you do not smoke any cigarettes. Imagine the steps you would need to take. It is very important that you actually see yourself changing your daily routine so that you are not

tempted to smoke cigarettes and have that picture in your mind. Think of the kinds of things you will need to do in order to stop smoking, especially when you might feel tempted to do so.

Now spend 2–3 minutes, imagining those steps. Think about all the things you would need to do in order to achieve your goal and think about all the things you would need to overcome. You will find that it might help to close your eyes when doing your visualization.

Once you have finished your visualization, please write down on the lines below a few sentences summarising the things you imagined you need to do to refrain from smoking cigarettes in the next 4 weeks. It should be as detailed as possible. Spend about 2–3 minutes writing down your thoughts.

_____

_____

_____

_____

Now, think about your goal to not smoke any cigarettes in the next four weeks. Now close your eyes again and visualize yourself having achieved that goal. ≪*Pause*≫ Think of all the effort you put in to achieving your goal now that you have finally accomplished it. See yourself standing at the point of success from where you can look back on the work you did to get there. Imagine how your life is different since you stopped smoking. Visualize the changes that resulted from the accomplishment of this goal. How does it feel to have started a new lifestyle that is good for you? ≪*Pause*≫ Picture your life as it is now, and compare it to how it will be if you stopped smoking for four weeks. Think about all of the benefits you will gain – health, financial, social. Visualize the satisfaction you feel at having achieved your goal. Picture the pride you feel, the confidence you feel in yourself, knowing you were successful. Try to feel the satisfaction you have with this accomplishment. Feel how proud and confident you are. Think about you daily routine. What does your day look like, without smoking a cigarette? Imagine a typical day and see yourself as someone who does not smoke cigarettes. Picture yourself thinking back to when you started working on your goal. How do you feel having successfully accomplished what you wanted? ≪*Pause*≫ Now, think about your loved ones, family, children, and friends. What will they think if you achieve your goal of not smoking for 4 weeks? Think of how proud they will be for putting in so much effort and how supportive they will be.

Now you have finished your visualization, using the lines below, please write down a few sentences summarizing the positive benefits you imagined as a result of not smoking any cigarettes in the next 4 weeks. It should be as detailed as possible. Spend about 2–3 minutes writing down your thoughts.

_____

_____

_____

_____

Example 6: Approach-Process Imagery Instructions for Physical Activity (Chan & Cameron, 2012)

In this exercise, you will be asked to imagine yourself engaging in all of the procedures or steps that would lead you to exercise as well as to imagine yourself becoming the type of person that you wish to be by exercising. Mentally picture yourself doing a specific type of exercise that you are likely to take part in next week (e.g., brisk walking).

Imagine the specific steps that you would take to do that exercise. Think about some of the favorable outcomes and benefits that you want to get as a result of exercising. What are the positive reasons that motivate you to exercise? For example, they may include getting fit, being more energized and building more muscles.

Mentally picture yourself changing as you achieve these desirable goals and outcomes by doing the exercise. Feel any emotions you experience when you see yourself progressing towards your desired self.

An example of the imagery would be that you see yourself doing brisk walking. You imagine yourself as you (1) get home directly after work, (2) put on your sports outfit (e.g. cap, sunglasses, shoes), (3) drive down to the nearest beach and (4) walk briskly along the waterfront for 30 min. You are becoming more vibrant and feeling happy with the changes in your body shape. You see yourself as more confident and energetic.

References

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Appendix 33.2 Sample Questionnaires for Use in Evaluation

Intention

I intend to participate in moderate or vigorous physical activity for at least 20 mins per day over the next three months. (Please tick **one** box)

Extremely unlikely	Very unlikely	Quite unlikely	Quite likely	Very likely	Extremely likely

Attitude

For me, doing moderate or vigorous physical activity for at least 20 mins per day the next three months is . . . (Please tick **one** box on each of the lines below)

	Extremely	Very	Quite	Quite	Very	Extremely	
Unimportant							**Important**
Not worthwhile							**Worthwhile**
Bad							**Good**

Self-efficacy/confidence

How confident are you that you will participate in moderate or vigorous physical activity for at least 20 mins per day over the next three months? (Please tick **one** box)

Extremely Unconfident	Very Unconfident	Quite Unconfident	Quite Confident	Very Confident	Extremely Confident

Motivation

How motivated are you to participate in moderate or vigorous physical activity for at least 20 mins per day over the next three months? (Please tick **one** box)

Not at all motivated	Not very motivated	A little motivated	Quite motivated	Very motivated	Extremely motivated

References

Hagger, M. S., Lonsdale, A. J., & Chatzisarantis, N. L. D. (2012). A theory-based intervention to reduce alcohol drinking in excess of guideline limits among undergraduate students. *British Journal of Health Psychology*, *17*, 18–43. https://doi.org/10.1111/j.2044-8287.2010.02011.x

Appendix 34.1 Implementation Intentions

Implementation intentions are if-then plans specifying what one will do and when one will do it in a contingent (e.g., if-then) format in order to realize goal intentions (Sheeran et al., 2018; see Chapter 6, this volume). They fall under techniques 1.1: Goal setting (behavior) and 1.3 Goal setting (outcome) in the Michie et al.'s (2013) taxonomy of behavior change techniques. It is well established that forming implementation intentions improves rates of behavioral performance and goal attainment compared to forming mere goal intentions (Gollwitzer & Sheeran, 2006, $d_+ = 0.65$, $k = 94$). Sheeran et al. (2018) provide a useful overview of research on implementation intentions to change affect-health behavior relations (see also Chapter 6, this volume). They distinguish between using implementation intention to regulate affect (e.g., Schweiger Gallo & Gollwitzer, 2007) and regulating the impact of affect on behavior (e.g., Webb, Schweiger Gallo et al., 2012).

Implementation intentions are typically delivered as written messages that individuals from the target population are requested to read and endorse. Variants commonly include implementation intentions provided for the individual (i.e., both the *if* and *then* components are specified), self-completed implementation intentions (i.e., the individual who wants to change either generates both an *if* and *then* statement or completes a then statement after being provided with an *if* statement), and volitional help sheets (i.e., a set of *if* and *then* statements are provided that the individual who wants to change is required to connect by drawing a line; Armitage, 2008). Prestwich et al. (2015) provide a useful guide to using implementation intention in relation to health behaviors.

A range of populations have been examined in relation to implementation intentions and affect. These include students, young people (Sheeran et al., 2016), adult women (Sheeran & Orbell, 2000), and spider phobics (Schweiger Gallo, & Gollwitzer, 2007), among others. Behaviors examined include between-meal snacking (Sheeran et al., 2016), alcohol consumption (Sheeran et al., 2016), cervical screening (Sheeran & Orbell, 2000), and psychotherapy attendance (Sheeran et al., 2007).

Webb et al. (2012a) report a meta-analysis of the effectiveness of implementation intentions on affect regulation. If-then plans were associated with large-sized improvement in affect compared to no instructions ($d_+ = 0.91$, $k = 21$). However, studies examining the subsequent impact of interventions using implementation intentions to target affect regulation on behavior are currently lacking (Sheeran et al., 2018). There are no current reviews of the effectiveness of implementation intentions on moderating the impact of affect on behavior. However, Sheeran et al. (2018) provide a useful review of studies using implementation intentions to moderate the impact of affective attitudes, anticipated affect, and implicit affect.

In relation to using implementation intentions to regulate affect, Schweiger Gallo et al. (Schweiger Gallo et al., 2009, Schweiger Gallo et al., 2012) showed that forming an implementation intention engenders better affective outcomes compared to forming goal intentions. For example, they found that supplementing a goal intention ("I will not get frightened!") with an if-then plan ("And if I see a spider, then I remain calm and relaxed!") attenuated negative affective reactions to spider images compared to both goal-intention–only and no-instruction

conditions. In relation to regulating the impact of affect on behavior, Webb, Sheeran et al. (2012, Experiment 1) showed that, after negative mood was induced, an if-then plan (e.g., "If I am in a bad mood, then I . . . think 'it is only a mood and I will not let it bother me!/think how I have successfully dealt with other situations!'") disrupted the impact of negative mood on riskier decisions. Similarly, Sheeran et al. (2007) had patients form if-then plans about how to reduce the impact of negative anticipated affect about attending psychotherapy sessions (e.g., "As soon as I feel concerned about attending my appointment . . . then I ignore that feeling . . . and tell myself this is perfectly understandable!") and showed this to increase attendance rates by 14 percent compared to control. Anticipated affect was shown to be a strong predictor of behavior in the control condition but to have no effect in the implementation intention condition.

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Appendix 34.2 Fear Appeals

Fear appeals are commonly used in health, advertising, and political campaigns as means to change behavior. Fear appeals are persuasive messages that aim to arouse fear by emphasizing the potential danger and harm that will befall individuals unless they adopt the messages' recommendations (Tannenbaum et al., 2015). Both images and written messages are commonly used. Fear appeals fall under technique 5.6: Information about emotional consequences in Michie et al.'s (2013) taxonomy of behavior change techniques.

A prominent example is the use of images of the negative outcomes of smoking on packets of cigarettes that is common in countries such as Australia and the UK. The aim of such messages is to increase fear related to the dangers of smoking. Studies appear to suggest such images do increase quitting rates for smoking (Brewer et al., 2018; Borland, 2018). Tannenbaum et al.'s (2015) meta-analysis of fear appeals indicated that fear appeals were associated with a small but significant overall effect in changing attitudes, intentions, and behavior ($d_+ = 0.29$, $k = 248$). Based on a reanalysis of the same data, White and Albarracín (2018) report a similar small-sized effect of fear appeals on behavior in studies comparing a high fear manipulation with a no-fear control in laboratory studies ($d_+ = 0.36$, $k = 10$). Nevertheless, the use of fear appeals remains a highly controversial area, with some reviews claiming that fear appeals are only effective when recipients have high self-efficacy to change the behavior (Kok et al., 2018; Peters, Ruiter, & Kok, 2013). Future research could usefully compare the effectiveness of interventions targeting fear, or other emotions such as disgust, with other affective interventions in changing behavior.

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Appendix 34.3 Full List of Text Messages Used by Carfora et al. (2016)

1. A diet rich in fruit and vegetables promotes emotional well-being and is associated with lower levels of anxiety and depression.
2. Serotonin, "the hormone of happiness," is naturally produced by the body; and stimulated by the consumption of simple sugars, such as those contained in fruit.
3. A diet rich in fruit and vegetables can help lower irritability, nervousness and confusion caused by stress.
4. Five servings of fruit and vegetables a day will help you feel more energetic! Fruits and vegetables slow down digestion, ensuring a steady supply of energy during the day.
5. Five servings of fruit and vegetables a day help reducing fatigue: try to replace sweets, which cause an increasing of the blood sugar level and its collapse, leading to fatigue and bad mood.
6. Eating five servings of fruit and vegetables a day helps in preventing apathy, drowsiness and slow down!
7. Eating five servings of fruit and vegetables a day is associated with optimism! People who show a positive attitude towards everyday life have higher levels of carotenoids, which can be taken by eating fruit and vegetables.
8. Eating five servings of fruit and vegetables a day is not only good for health but also promotes relationships: people who eat them are more beautiful. This was demonstrated by a British research, which showed that eating plenty of fruit and vegetables supposedly gives people a golden glow that makes them more attractive.
9. A study on 80,000 British people, found that higher consumption of fruit and vegetables coincides with a higher sense of satisfaction and well-being. A diet rich in vegetables may have a beneficial effect on mood not only in the long term, but also day-to-day, influencing the positive emotions of individuals daily.
10. Eating five servings of fruit and vegetables a day can increase your self-esteem. A healthy diet, combined with physical activity, will help you feel better about yourself. Excessive consumption of junk food will make you gain weight and feel sluggish and sick. Eating the right foods, such as fruit and vegetable, will give you more energy and you feel calmer. If you feel better, you judge yourself with less severity.
11. Members of the University of Leiden in the Netherlands, found out that a substance that can be found in spinach (as well as in other fruits and vegetables, such as bananas, nuts and avocados) is likely responsible for the production of two important neurotransmitters in the brain. These neurotransmitters facilitate faster transmission of nerve impulses, improving your reflexes and making you more snappy.
12. Protein consumption is closely related to the physical and mental well-being. Rich sources of protein are not only meat, fish, eggs, milk and cheese, but also fruit and vegetables. For example, the amino acid tryptophan (found in bananas, dried fruit and vegetables such as spinach, cabbage, asparagus) has satiating and calming properties, modulates the mood and both emotional and sexual functions.
13. A proper intake of vitamins is essential for proper psychophysical functioning. Particularly, lack of vitamins of the B group (found in oranges, lemons, mandarins, apples, nuts, artichokes, carrots,

zucchini …) is associated with anxiety, fear, mood problems, dementia and/or psychotic disorders.

14. Recent research has shown a strong correlation between generous consumption of fruit and vegetables and the appearance of positive feelings in the next twenty-four hours; related especially to the reduction of anxiety and, more generally, to a greater serenity.

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Appendix 34.4 Narrative Information Targeting Anticipated Affect by Dillard et al. (2010)

Segment 1 (appeared in beginning of message, after introduction to screening). When I thought about getting screened for colon cancer, I just wasn't sure I wanted to do it. I had mixed feelings. I didn't know what to expect because I knew little about the screening tests. I mean, how do they work? And people don't seem to talk about it so it's hard to get the details. I guess the one thing I did think was that screening sounded kind of _____ *(matched to participants' top rated barrier from baseline). Possible responses included: uncomfortable – I didn't like the idea of having something done on such a sensitive part of my body; embarrassing – I didn't like the idea of having people look at me back there; inconvenient – I didn't like the idea of having to take time off work to get this done; worrisome – I didn't like the idea of having to worry about whether the doctor would say I have cancer; disgusting – I didn't like the idea of having to take the laxative and be in the bathroom a lot before the test.*

Segment 2 (appeared after describing risk factors of screening). When thinking about screening, I couldn't help but think about how I had been feeling fine for a while. Why would I have a test if I wasn't having any problems? Of course, then I started to wonder "what if there was something in there growing after all?" And if one day I did find out that I had cancer, it would be awful to think I could have done something about it earlier.

Segment 3 (appeared after describing test procedure, including preparation and test day). When trying to decide about a colonoscopy, I spent a lot of time thinking about what the experience would be like. I was thinking about how the night before would be the worst part. It could mean lots of trips to the bathroom and then not sleeping so well. The actual test sounded kind of painful too – a tube is inserted into the colon! And I couldn't help but think that it would be embarrassing when the doctor and nurse were doing the test, looking at me back there and everything. But then on the other hand, I thought, "these things won't last forever," and it might be nice to just get it done and over with. It could give me some peace of mind.

Segment 4 (appeared at end of message). In the end, I decided to get the colonoscopy, and I have to say, the experience wasn't nearly as bad as I expected. I did spend a lot of time in the bathroom the night before, but it didn't bother me because I got to catch up on my reading. Also, the day of the test went better than I thought. My daughter gave me a ride to the appointment and then waited with me. When I got to the exam room, the nurse made me feel relaxed, and the procedure was over before I knew it. The air thing was not painful like I thought it would be, just a strange feeling. During this whole process, I surprised myself quite a bit. I remember in the beginning, I was really anticipating a negative experience. But I found that during all of it – the prep, the procedure, and waiting for the results, I was unexpectedly calm. I was thinking whatever happens – I'll deal with it just like I deal with everything else in life.

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Appendix 35.1 Six Recommended Autonomy-Supportive Instructional Behaviors

1. Take the Supervisee's Perspective

The supervisor sees the learning experience as if they were the supervisee. Before the interaction, the supervisor partially sets aside their own priorities to better see and hear the supervisee's perspective and preferences. During the interaction, the supervisor welcomes input and conducts formative assessments. Once the supervisor appreciates what the supervisee wants and prefers, they adapt the flow of instruction accordingly.

2. Vitalize Supervisee's Psychological Needs

The supervisor presents learning activities in ways that are highly likely to involve, vitalize, and satisfy the supervisee's psychological needs for autonomy (e.g., "What would you like to do?"), competence (e.g., "Can you do this?"), and relatedness (e.g., cooperative learning opportunity).

3. Provide Explanatory Rationales

The supervisor explains why putting forth effort during the learning activity might be a personally useful thing for the supervisee to do. When asking the supervisee to engage in a relatively uninteresting activity or behavioral request, the supervisor helps the supervisee motivationally transform "something not worth doing" into "something worth doing" so to realize the otherwise hidden benefit identified by the supervisor (see Appendix 35.4).

4. Rely on Invitational, Informational Language

The supervisor's verbal and nonverbal communications minimize pressure while offering choice, flexibility, and understanding. The supervisor provides the special insights supervisees need to better diagnose, understand, and solve the motivational problem they face (e.g., "Last year, someone else had this same problem, and what she did was . . . ") that is accompanied by an invitation to action (e.g., "You may want to give that a try").

5. Acknowledge and Accept Expressions of Negative Affect

The supervisor shows sensitivity to, and a tolerance of, the supervisee's concerns and negative emotionality. The supervisor acknowledges that their request may conflict with the supervisee's preferences and that the supervisee's complaining may be a somewhat valid and legitimate reaction to the behavioral request. With the supervisee's input and suggestions, the supervisor then restructures the conflict-generating request so that it becomes something more appealing to the supervisee (see Appendix 35.4).

6. Display Patience

The supervisor waits calmly for the supervisee's input, initiative, and willingness. The supervisor gives the supervisee the time and space they need during the activity to overcome the inertia of inactivity. The supervisor allows the supervisee to work at their own pace and with their own natural rhythm.

Appendix 35.2 Teaching Scenarios Questionnaire

Instructions

Two different approaches to instruction follow these instructions.

The first approach, entitled "Teaching Scenario #1", presents one approach to teaching, while a second approach presented in "Teaching Scenario #2".

We are interested in how much each way of teaching describes what you do in the classroom as well as your impressions and beliefs about each way of teaching.

Please read the first approach to teaching ("Teaching Scenario #1") and take a moment to think about that approach to instruction. For the 4 statements below that approach, we ask you to please circle a number from 1 to 7 to communicate how much or how little that way of teaching describes what you do (or would do) in the classroom. Next, 12 additional statements ask about your impressions (or beliefs about) this first way of teaching.

Please read the second approach to teaching ("Teaching Scenario #2") and again take a moment to think about that approach to instruction. For the 4 statements below that approach, we again ask you to circle a number from 1 to 7 to communicate how much or how little it describes what you do (or would do) in the classroom. Next, 12 statements ask about your impressions (or beliefs about) this second way of teaching.

There are no right or wrong answers.

Instead, we are interested in learning about your approach to teaching.

Teaching Scenario #1. As you plan and prepare for an upcoming lesson, you think about what needs to be covered. You make a step-by-step plan of what students are supposed to do and when they are supposed to do it. As the class period begins, you tell students what to do, monitor their compliance closely, and when needed make it clear that there is no time to waste. To keep students on-task, you make sure they follow your directions, obey your assignments, and basically do what they are supposed to do while not doing what they are not supposed to do. When students stray off task, you correct them saying, "You should be working now," "act responsibly," and "there is a time for work and there is a time for talk – now is a time for work."

To motivate students, you offer little incentives and privileges. When students encounter difficulties and setbacks, you intervene quickly to show and tell them the right way to do it. When they do what you tell them to do and when they produce right answers, you smile and give them your praise. When they don't do what you tell them to do and when they misbehave, you make it clear that you are in charge and that it is your responsibility to make sure that they act responsibly and complete their work. Overall, you take a "no-nonsense" attitude and make sure students do what you tell them to do, even if it means you need to push and pressure them into doing what they are supposed and required to do.

Please answer the 4 questions below in reference to Teaching Scenario #1:

		No, not at all						Yes, very much so
1.	This approach to teaching describes how I teach my students on a daily basis.	1	2	3	4	5	6	7
2.	This approach to teaching nicely describes what I do during class.	1	2	3	4	5	6	7
3.	This is an accurate and true description of what I do during my teaching.	1	2	3	4	5	6	7
4.	I do ***not*** teach this way.	1	2	3	4	5	6	7

My impressions about Teaching Scenario #1:

		No, not at all						Yes, very much so
1.	This approach to teaching is ***easy*** to do	1	2	3	4	5	6	7
2.	Most teachers can teach in this way It is *not* asking or demanding too much from teachers.	1	2	3	4	5	6	7
3.	This approach to teaching is ***easy*** and ***simple*** to do (i.e., it is *not* hard and difficult to do).	1	2	3	4	5	6	7
4.	This approach to teaching is ***effortless*** and ***manageable*** (i.e., it is *not* too demanding and unmanageable).	1	2	3	4	5	6	7
5.	This approach to teaching is ***effective*** in terms of motivating and engaging students.	1	2	3	4	5	6	7
6.	This approach to teaching would ***benefit*** my students in terms of their performance and achievement.	1	2	3	4	5	6	7
7.	I ***like*** and think ***positively*** about this approach to teaching.	1	2	3	4	5	6	7
8.	This approach to teaching will produce ***good*** and ***desirable*** results. It works!	1	2	3	4	5	6	7
9.	Most teachers teach this way.	1	2	3	4	5	6	7
10.	Where I work, this approach to teaching is the ***norm***. Most teachers I know and work with teach this way.	1	2	3	4	5	6	7
11.	This approach to teaching is very ***typical***.	1	2	3	4	5	6	7
12.	This approach to teaching is ***common*** among the teachers I know and work with.	1	2	3	4	5	6	7
		1	2					

Teaching Scenario #2. As you plan and prepare for an upcoming lesson, you think about what your students want and need. You wonder if students will find the lesson interesting and relevant to their lives.

To support their interest and valuing of the lesson, you prepare some resources in advance so that they can see how interesting and how important the lesson truly is. To better engage students in the lesson, you create a challenging activity for students to do, and you create some engaging questions to piqué their interest.

As the class period begins, you invite your students' input and suggestions before finalizing the day's lesson plan, letting your students know that you welcome and value their initiative, ideas, and suggestions.

To motivate students, you take the time to explain why the lesson is important, how it aligns with their personal goals, and why it is a truly worthwhile thing to do. When students encounter difficulties and setbacks, you display patience – giving them the time and space they need to figure out the problem for themselves. When students complain and show little or no initiative, you acknowledge and accept their negative feelings, telling them that you understand why they might feel that way, given the difficulty and complexity of the lesson. As you talk with your students, you resist any pressuring language such as "you should," "you must," and "you have to." Instead, you communicate your understanding and encouragement.

Overall, you take your students' perspective, welcome their thoughts, feelings, and actions into the flow of the lesson, and support their developing capacity for autonomous self-regulation.

Please answer the 4 questions below in reference to Teaching Scenario #2:

	No, not at all						Yes, very much so
1. This approach to teaching describes how I teach my students on a daily basis	1	2	3	4	5	6	7
2. This approach to teaching nicely describes what I do during class.	1	2	3	4	5	6	7
3. This is an accurate and true description of what I do during my teaching.	1	2	3	4	5	6	7
4. I do ***not*** teach this way.	1	2	3	4	5	6	7

My impressions about Teaching Scenario #2:

		No, not at all						Yes, very much so
1.	This approach to teaching is ***easy*** to do.	1	2	3	4	5	6	7
2.	Most teachers can teach in this way. It is *not* asking or demanding too much from teachers.	1	2	3	4	5	6	7
3.	This approach to teaching is ***easy*** and ***simple*** to do (i.e., it is *not* hard and difficult to do).	1	2	3	4	5	6	7
4.	This approach to teaching is ***effortless*** and ***manageable*** (i.e., it is *not* too demanding and unmanageable).	1	2	3	4	5	6	7
5.	This approach to teaching is ***effective*** in terms of motivating and engaging students.	1	2	3	4	5	6	7
6.	This approach to teaching would ***benefit*** my students in terms of their performance and achievement.	1	2	3	4	5	6	7
7.	I ***like*** and think ***positively*** about this approach to teaching.	1	2	3	4	5	6	7
8.	This approach to teaching will produce ***good*** and ***desirable*** results. It works!	1	2	3	4	5	6	7
9.	Most teachers teach this way.	1	2	3	4	5	6	7
10.	Where I work, this approach to teaching is the ***norm***. Most teachers I know and work with teach this way.	1	2	3	4	5	6	7
11.	This approach to teaching is very ***typical***. Every teacher I know teaches this way.	1	2	3	4	5	6	7
12.	This approach to teaching is ***common*** among the teachers I know and work with.	1	2	3	4	5	6	7

Appendix 35.3

AUTONOMY-SUPPORTIVE TEACHING	*Never Not at all*		*Occasionally Sometimes yes, Sometimes no*			*Frequently, Always*	
Takes the Students' Perspective • Invites, Asks for, Welcomes, and Incorporates Students' Input • Is Aware of Students' Wants, Preferences, and Priorities	1	2	3	4	5	6	7
Vitalizes Inner Motivational Resources during Instruction • Vitalizes and Supports Students' Autonomy, Competence, Relatedness • Provides Interesting Learning Activities • Suggests Intrinsic Goals to Pursue	1	2	3	4	5	6	7
Provides Explanatory Rationales for Requests, Rules, Procedures, and Uninteresting Activities • Explains Why; Says, "Because, . . .," "The reason is . . . " • Identifies the Value, Importance, Benefit, Personal Utility of a Request	1	2	3	4	5	6	7
Uses Non-Pressuring, Informational Language • Flexible, Open-minded, Responsive Communication • Provides Choices, Options • Verbally and Nonverbally says, "You may . . .," "You might . . . "	1	2	3	4	5	6	7
Acknowledges and Accepts Negative Affect • Acknowledges Students' Negative Affect ("Okay"; "Yes") • Accepts Complaints as Reasonable, as Valid	1	2	3	4	5	6	7
Displays Patience • Calmly Waits for Signals of Students' Initiative, Input, Willingness • Allows Students to Work at their Own Pace, in their Own Way	1	2	3	4	5	6	7

CONTROLLING TEACHING	*Never Not at all*						*Occasionally Sometimes yes, Sometimes no*	*Frequently, Always*
Takes Only the Teacher's Perspective • Attends to and Prioritizes Only Teacher's Plans, Needs • Is Unaware of/Unresponsive to Students' Wants, Preferences, and Priorities	1	2	3	4	5	6	7	
Introduces Extrinsic Motivators • Offers Incentives: Gives Consequences for Desired & Undesired Behaviors • Seeks Compliance: Utters Assignments, Directives, and Commands	1	2	3	4	5	6	7	
Neglects to Provide Explanatory Rationales for Requests, Rules, Procedures, and Uninteresting Activities • Directives without Explanations • Requests ("do this; do that") without Explanations	1	2	3	4	5	6	7	
Uses Controlling, Pressuring Language • Evaluative, Critical, Coercive, Inflexible; "No Nonsense" • Prescriptive ("You *should*, you *must*, you *have to*, you've *got to* . . . ") • Verbally and nonverbally pressuring (raises voice, points, pushes hard, "hurry") • Communicates "What is Right" & Pushes Students to Reproduce It Quickly	1	2	3	4	5	6	7	
Counters and Tries to Change Negative Affect • Counters/Argues Against Students' Negative Affect, Complaining, and "Bad Attitude" • Tries to Change Negative Affect into Something More Acceptable to the Teacher	1	2	3	4	5	6	7	
Displays Impatience • Rushes Students to Produce a Right Answer or a Desired Behavior • Intrudes into Students' Workspace (Grabs away learning materials; Says: "Here, let me do that for you.")	1	2	3	4	5	6	7	

Appendix 35.4 Excerpt of Slides Used During the Autonomy Support Training Program (ASIP)

Teaching Skill:

Promote Internalization

Common Problems

Poor Performance

- Students' work is sloppy, careless.
- Students perform incompetently.
- Students underperform class standards.
- Students feel lost, overwhelmed by classroom challenges.
- Students cheat, plagiarize.

Disengagement

- Students fail to involve themselves in the learning activity.
- Students are off-task.
- Students fail to participate.
- Students show little initiative.
- Students just sit passively in class.
- Student procrastinate.

Misbehavior

- Students act irresponsibly.
- Students act disrespectively, and use disrespectful language.
- Students act in antisocial ways, verbally and nonverbally.
- Students come to class unprepared.
- Students break rules.
- Students disregard classroom procedures.

Teachers' Typical Reaction to These Problems

Teacher's typical reaction:
Look at it only from the teacher's point of view.
Oppose, counter and try to change the student.

- Teacher diagnoses there is a problem:

  "What you did was bad/wrong."

- Teacher diagnoses why there is a problem:

  "This is what caused the problem."

- Teacher proposes a solution to the problem:

  "This is what you need to do differently…"

- Teacher insists that the student comply with that solution:

  "Make sure you get this done, or else…"

Typical Results…

- Teacher is frustrated.
- Student is frustrated.
- The problem recurs: disengagement persists, poor performance persists, misbehavior persists.
- Teacher-student relationship moves toward conflict.

Acknowledge & Accept Expressions of Negative Affect

What it is:

- Teacher acknowledgments that, yes, his/her request may generate some negative affect, resistance, or conflict and, yes, these negative feelings are potentially valid and legitimate reactions to the request. The teacher then invites suggestions in what can be done to remove that negative affect—while still fulfilling the teacher's request.

How to do it:

Acknowledge negative feelings:

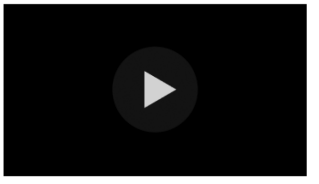
"***I see*** that you all are not very enthusiastic about today's lesson."

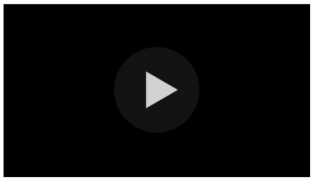
Accept them as potentially valid reactions:

"***Yes***, we have practiced this same skill many times before, haven't we?"

Welcome suggestions to solve the motivational problem:

"***Okay***. So, what we might do differently this time? Any suggestions?"





Provide Explanatory Rationale for Teacher Requests

What it is:

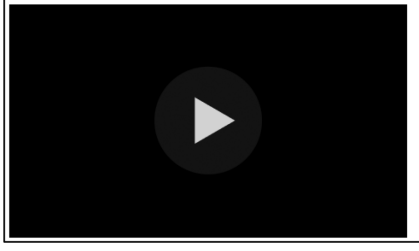
- Verbal explanations to help students understand why self-regulation of the activity would have personal utility. Explanations to help students transform (i.e., internalize) *something not worth* doing into *something worth doing*—something worth their time, attention, and effort.

How to do it:

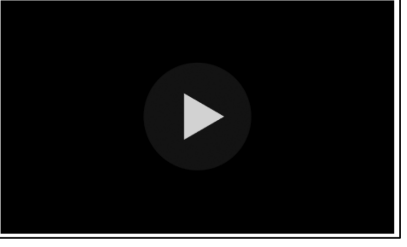
(1) Teacher communicates that the activity, request, rule, or procedure is ***useful***.

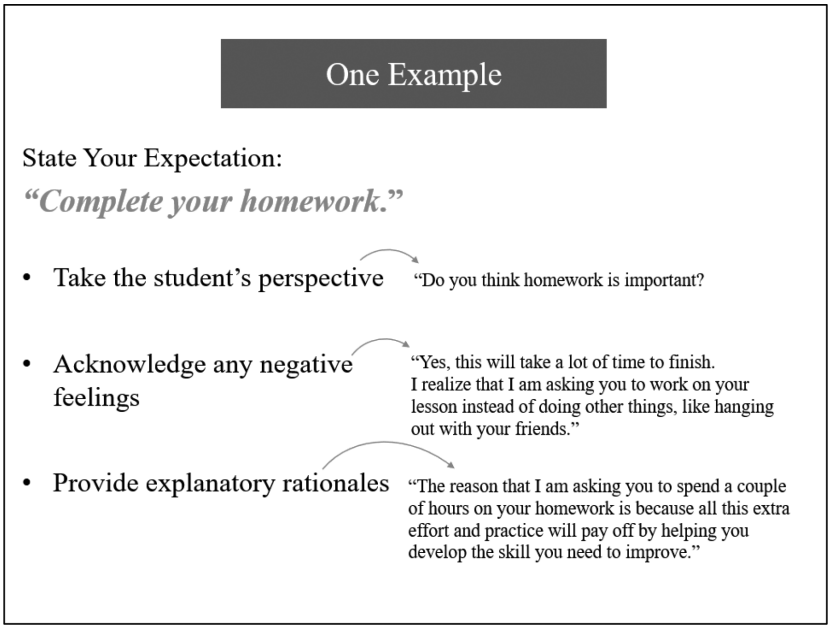
(2) Teacher explains ***why*** the activity is useful—why it has personal benefit to the student.

Example 1: *Why use respectful language*?



Example 2: *Why follow the rules*?




One Example
State Your Expectation:
"Complete your homework."
• Take the student's perspective
"Do you think homework is important?
• Acknowledge any negative feelings
"Yes, this will take a lot of time to finish. I realize that I am asking you to work on your lesson instead of doing other things, like hanging out with your friends."
• Provide explanatory rationales
"The reason that I am asking you to spend a couple of hours on your homework is because all this extra effort and practice will pay off by helping you develop the skill you need to improve."

Appendix 38.1 Examples of SMART Goals

Table A38.1.1 Examples of SMART and non-SMART goals from various behavioral domains

Non-SMART Goals	SMART Goals	Goal Content
Study more	Do my homework after class on Monday, Wednesday, and Friday.	S = "do my homework" M = homework done on Monday, Wednesday, and Fridays A = only 3 days per week R = will help with passing exams T = every week
Eat more fruit and vegetables	Incorporate at least one additional fruit or vegetable into each of my meals.	S = "incorporate at least one additional fruit or vegetable" M = ate one extra fruit or vegetable every meal A = only one extra fruit or vegetable R = will help with maintaining health T = every mealtime
Get more sleep	Maintain a consistent sleep schedule in order to get about 8 hours of sleep per night.	S = "maintain a consistent sleep schedule in order to get 8 hours of sleep" M = had 8 hours sleep per night A = only 8 hours sleep R = will help with maintaining health T = every night
Go to the gym	On Tuesdays and Thursdays, go to the gym for 30 minutes before work.	S = "go to gym 30 minutes before work" M = went to gym for 30 minutes on Tuesdays and Thursdays A = only twice a week R = will help with fitness T = every week
Meet deadlines at work	Attend weekly meeting and complete assigned actions prior to the next meeting.	S = "attend weekly meetings and complete assigned actions" M = attended weekly meetings and completed assigned actions A = only a week's worth of actions R = will help keep on top of work T = every week

Appendix 38.2 SMART Goal Setting Worksheet Adapted from Lawlor and Hornyak (2012)

Often people set big, broad goals and get discouraged when they do not meet them. Implementing the SMART (specific, measurable, attainable, realistic, and time-bound) goal setting framework can assist with setting difficult yet achievable goals.

Initial Goal (*What aim do you have in mind?*)

_____

1. Specific (*What exactly do you want to accomplish? Why?*)

   _____
   _____
   _____

2. Measurable (*What indicator of progress can you use? When will you know if you have successfully reached your goal?*)

   _____
   _____
   _____

3. Achievable (*Can you realistically achieve this goal with effort and commitment? Do you have the resources to do so?*)

   _____
   _____
   _____

4. Relevant (*Why are you setting this goal? Is it meaningful to you and aligned with your overall objectives?*)

   _____
   _____
   _____

5. Time-bound (*When will this goal be achieved? What is your deadline?*)

   _____
   _____
   _____

SMART Goal (*What is your revised goal?*)

_____
_____
_____

References

Lawlor, K. B., & Hornyak, M.J. (2012). SMART goals: How the application of SMART goals can contribute to achievement of student learning outcomes. *Developments in Business Simulation and Experiential Learning*, *39*, 259–267.

Appendix 38.3 Goal setting and SMART Goal Resources

Michie and colleagues (2008) provided the following client informational sheet in their *Health Trainer Handbook*:

SMART goals

After having your Health Behaviour Check, you've probably decided on one type of health behaviour that you'd like to change. For example, you may have decided you'd like to do more physical activity. At this point you need to set your first goal. Goals need to be SMART:

Specific
Measurable
Achievable
Relevant
Timely

pecific – your goal needs to be clear and detailed, not vague. For example, a vague goal would be 'being fit and athletic', whereas a clear, specific goal would be "I will work out at the local gym for at least 30 minutes three times a week, 7pm on Mondays and Thursdays and 10am on Saturdays." Ask yourself the following questions:

What are you going to do? **When** are you going to do it?
Where are you going to do it? **With whom** are you going to do it?

easurable – making the goal specific means that it should be easy to measure. The example above, "I will work out at the gym for at least 30 minutes three times a week" is measurable. You can record the number of times you went to the gym in one week, and also how long you worked out for each time. It would be hard to measure a vague goal like 'being fit and athletic'.

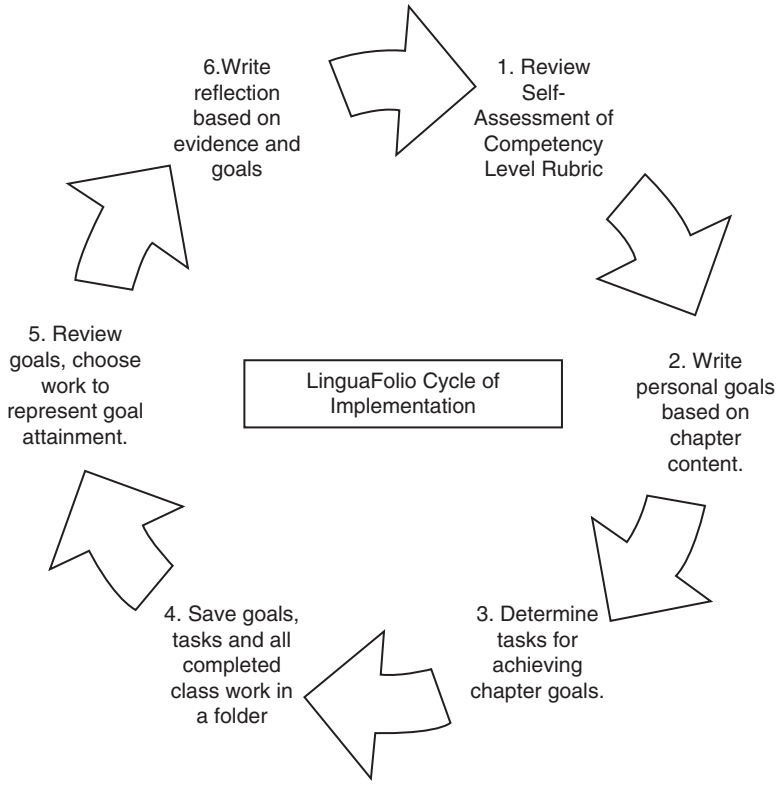
chievable – try to set goals that are within your reach. If you set yourself a really hard goal and don't achieve it, it can make you feel bad and you may want to give up. Make your first goal quite easy to achieve and this can give your self-confidence a boost.

elevant – is this an important goal for you? Is it a behaviour that you really want to change? You are much more likely to succeed in reaching your goal if you can see the important difference that changing this behaviour will make to your health.

imely – is this the right time to try to achieve this goal? Give yourself a set amount of time in which to complete your goal. If you don't give yourself a target date, it's easier to keep putting off actually starting to change your behaviour, and you may never reach your goal. For example, if your next session with your Health Trainer is next week, aim to have reached your goal in one week. If you think your goal will take longer than a week, try breaking it down into 'mini-goals' so that you can achieve something each week. For example, if your goal is to eat five portions of fruit and veg a day, a mini-goal could be to eat at least one portion of fruit or veg each day.

Goal Setting Programs

A quasi-experimental study examining goal setting and student achievement implemented a system based on goal setting in a Spanish-language



classroom (Moeller, Theiler, & Wu, 2012). The table here shows a cycle of implementation of the program and subsequent rubric for scoring student-produced goals.

References

Michie, S., Rumsey, N., Fussell, A. et al. (2008) *Improving Health: Changing Behaviour*. NHS health trainer handbook (Best Practice Guidance: Gateway Ref 9721). Department of Health Publications. http://eprints.uwe.ac.uk/12057

Moeller, A. J., Theiler, J. M., & Wu, C. (2012). Goal setting and student achievement: A longitudinal study. *The Modern Language Journal*, *96*, 153–169. https://doi.org/10.1111/j.1540-4781.2011.01231.x

LinguaFolio Goal Setting Process Rubric

	4/High	3/Mid-High	2/Mid-Low	1/Low
Goals	Goals use authentic language and are tied to context. Goals are growth-oriented, theme-based, measurable, specific, realistic, challenging, personally relevant, and time-bound ("by the end of this chapter . . .").	Goals do not necessarily use authentic language. Goals are somewhat contextualized, growth-oriented, and connected to a theme. Goals are measurable, somewhat specific, realistic, and somewhat challenging.	Goals do not use authentic language and/or are not growth-oriented, not theme-based, broad, unfocused, vague or too specific, too challenging, or not at all challenging.	Goals are not authentic, there is no focus on growth, and they are too broad, unrealistic, and/or generic. The student is unable to articulate a goal.
Action Plan	Breaks down goal into a specific action plan with manageable tasks. It is clear how each goal will be achieved.	Action plan present but not specific or additional steps would be necessary in order to make the goal manageable.	Action plan present but specific steps for success are not articulated, extremely vague (i.e., "study," "listen").	No action plan for improving achievement.
Evidence and Reflection	Goals are reflected on and are consistently revised when deemed inappropriate by the student. Each sample of work in the dossier includes a rationale for why it was chosen and how it relates to the goals that were set. The rationale is very clearly stated, labeled, and dated.	Goals are reflected on and are sometimes revised when deemed inappropriate. Most samples of work in the dossier include a rationale for why they were chosen and how they relate to the goals that were set. The rationale is briefly stated and may or may not be labeled and dated.	Goals are reflected on, but they are not revised when deemed inappropriate. Few samples of work in the dossier include a rationale for why they were chosen and/or how they relate to the goals that were set. The rationale, if stated, is vague and lacking labels and dates.	Goals are not reflected on. No samples of work in the dossier include a rationale for why they were chosen and/or how they relate to the goals that were set.

Appendix 38.4 Example Goal Setting Intervention for Screen-Time Reduction

Description

Goal setting is an effective technique used to assist in reducing screen time, as it helps focus efforts and support persistence to reach that goal. Research has shown that setting specific and difficult goals is most effective for reaching your goal, such as "I will reduce my screen time by 90 minutes per day."

Set SMART Goals

While your overarching goal might be to reduce your screen time, a goal that broad may be difficult to achieve. It is best to start with achievable yet sufficiently difficult goals. To this end, implementing the SMART goal framework (Doran, 1981) will help you reach your goals. SMART goals are specific, measurable, attainable, realistic, and time-bound.

Example

The following is an example of a SMART goal:

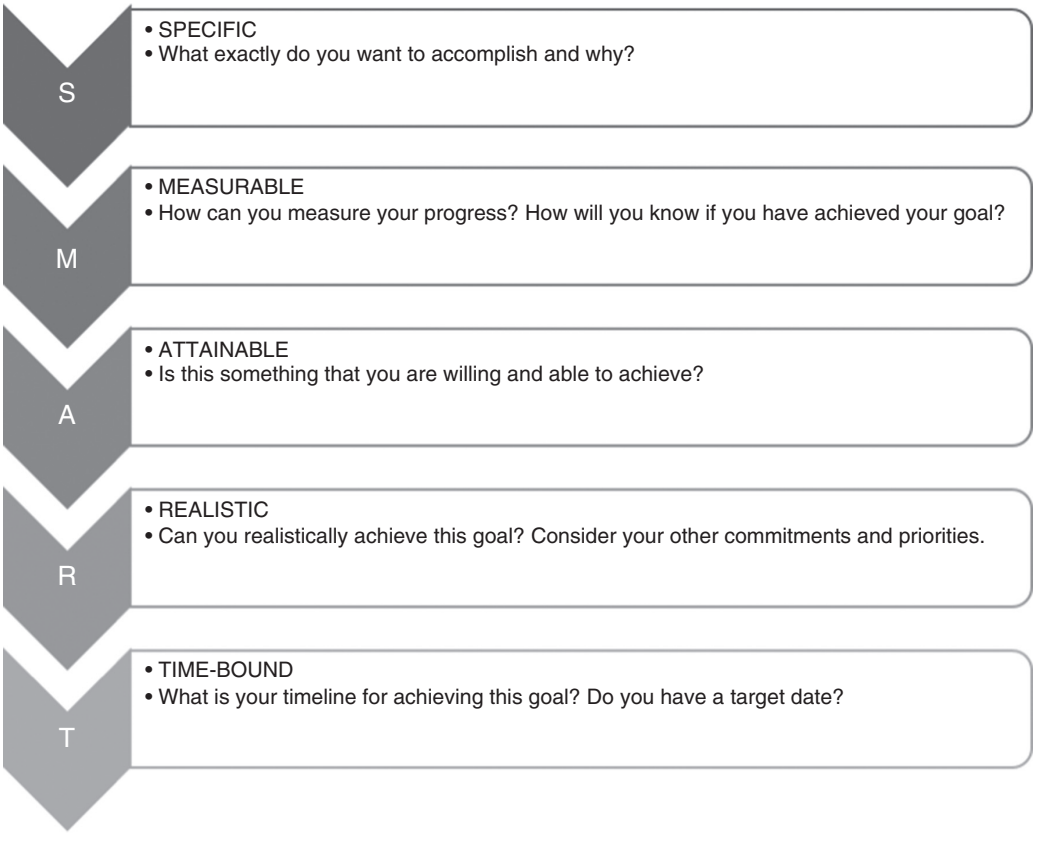
My goal is to reduce my screen time by 90 minutes per day by turning off the television during mealtimes.

Instructions

Please develop a goal for reduced screen time that is tangible for you and somewhat difficult to achieve. Use the SMART guidelines for goal setting to ensure that your goal is specific, measurable, attainable, realistic, and time-bound."
Goal:_____

References

Doran, G. T. (1981). There's a S.M.A.R.T. way to write management's goals and objectives. *Management Review*, *70*, 35–36.


S
• SPECIFIC
• What exactly do you want to accomplish and why?
M
• MEASURABLE
• How can you measure your progress? How will you know if you have achieved your goal?
A
• ATTAINABLE
• Is this something that you are willing and able to achieve?
R
• REALISTIC
• Can you realistically achieve this goal? Consider your other commitments and priorities.
T
• TIME-BOUND
• What is your timeline for achieving this goal? Do you have a target date?

Appendix 39.1 Action Planning Scripts

The following script was used in an action planning intervention to encourage regular physical activity among cardiac rehabilitation patients (Sniehotta, Scholz, & Schwarzer, 2006):

Please think about the time after discharge from the rehabilitation centre. When, where and how do you plan to be physically active? Please write down your plans in the following table. The more precise, concrete and personally you formulate your plans, the more they can help you.

	When	Where	How	With whom
Plan 1:				
Plan 2:				
Plan 3:				

Memorize your plans carefully. Visualize the situations and your planned actions and make a firm commitment to act as planned.

Koka and Hagger (2017) presented their participants with the following script in their action planning intervention to increase physical activity behavior among adolescents:

Many young people find that they intend to participate in vigorous physical activities during their leisure-time on a regular basis, but they never actually do it. You are more likely to participate in vigorous physical activities during your leisure-time for at least 30 min a time, at least 5 days per week if you plan in advance where, when and how you are going to do it. Please think and decide now exactly where, when and how do you plan to participate in vigorous physical activities during your leisure-time for at least 30 min a time, at least 5 days per week over the next three months. Please write on the lines below where, when and how do you plan to participate in vigorous physical activities during your leisure-time for at least 30 min a time, at least 5 days per week over the next three months.

References

Koka, A., & Hagger, M. S. (2017). A brief intervention to increase physical activity behavior among adolescents using mental simulations and action planning. *Psychology, Health and Medicine*, *22*, 701–710. https://doi.org/10.1080/13548506.2016.1211298

Sniehotta, F., Scholz, U., & Schwarzer, R. (2006). Action plans and coping plans for physical exercise: A longitudinal intervention study in cardiac rehabilitation. *British Journal of Health Psychology*, *11*, 23–37. https://doi.org/10.1348/135910705X43804

Appendix 39.2 Action Planning Worksheets and Interventions

The following action planning worksheet was employed as part of an intervention to promote family physical activity (Quinlan et al., 2015).

3: PLANNING WORKSHEET

What, Where, and When will you Engage in Exercise?		
Instructions: List the specific EXERCISES/ACTIVITIES your family plans on doing. Choose a LOCATION in which this exercise will take place. Describe WHEN you will perform that activity (consider preparation/transit time).		
ACTIVITY	LOCATION	DAY & TIME
Example Exercise: Hiking	Where: The trail around the park in my community.	When: Monday & Friday evenings between 6:00 and 7:00pm.
Exercise #1:	Where?	When?
Exercise #2:	Where?	When?
Exercise #3:	Where?	When?

In a web-based workplace sitting intervention, participants were prompted to create the following action plan (De Cocker et al., 2017):

Users were asked *what* (increase standing breaks, or replace sitting by standing, or both) they wanted to do, *how long* (breaks: 10s, 20s, …, 4 min, 5 min; standing: 15 min, 30 min, …, 3hr 45 min, 4hr, >4hr), *how often* (breaks: every 5, 10, …, 55, 60 min), and *when* (during working hours, lunch, commuting, or combinations) they wanted to change.

References

De Cocker, K., De Bourdeaudhuij, I., Cardon, G., & Vandelanotte, C. (2017). What are the working mechanisms of a web-based workplace sitting intervention targeting psychosocial factors and action planning? *BMC Public Health*, *17*, 382. https://doi.org/10.1186/s12889-017-4325-5

Quinlan, A., Rhodes, R., Blanchard, C., Naylor, P., & Warburton, D. (2015). Family planning to promote physical activity: A randomized controlled trial protocol. *BMC Public Health*, *15*, 1011. https://doi.org/10.1186/s12889-015-2309-x

Appendix 39.3 Example Action Planning Intervention

Description

Many people have the intention of being physically active, yet the majority of people struggle to meet physical activity guidelines. You are more likely to participate in moderate to vigorous physical activity for 150 minutes weekly if you make a detailed plan of how exactly to enact this behavior. To this end, action planning is a useful strategy that can help you be more active. Action plans include the "when," the "where," and the "how" of your physical activity behavior.

Example

On Monday, Wednesday, and Friday at 5pm (when), I will go for a 50 minute run (how) around my neighborhood (where).

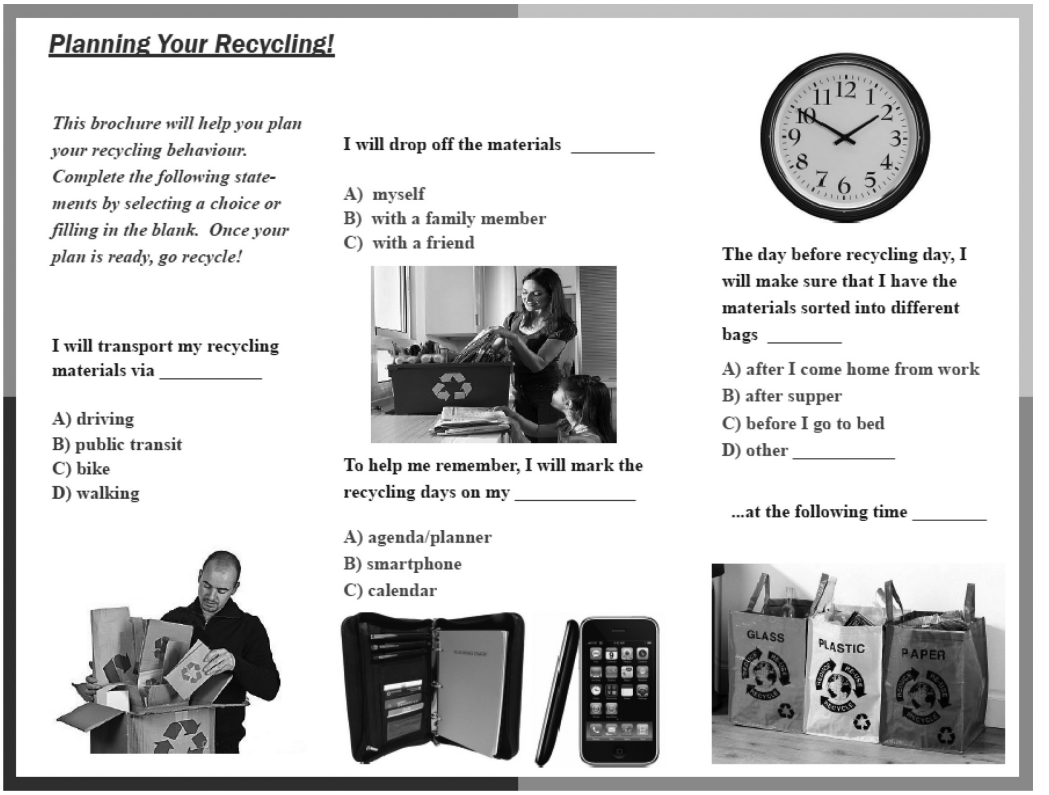
Instructions

In the spaces in the table please detail "when," "where," and "how" you will be physically active.

Activity	Location	Day and Time
E.g., Walk two times per week	E.g., On the trails in my neighborhood	E.g., Monday and Wednesday after dinner

Appendix 39.4 Preparatory Planning Script

Rhodes and colleagues (2014) used preparatory planning concepts in an informational brochure as part of their planning intervention to promote recycling behavior:



References

Rhodes, R. E., Beauchamp, M. R., Conner, M., de Bruijn, G., Latimer-Cheung, A., & Kaushal, N. (2014). Are mere instructions enough? Evaluation of four types of messaging on community depot recycling. *Resources, Conservation and Recycling*, *90*, 1–8. https://doi.org/10.1016/j.resconrec.2014.04.008

Appendix 39.5 Example Preparatory Planning Intervention (Adapted from de Bruijn et al., 2017)

Description

One way that can help you achieve 150 minutes of physical activity per week is to plan for the actions leading up to your physical activity. For example, if you formulate a specific preparatory action plan to pack your workout gear in your bag in the morning rather than going home after work, you may be more likely to translate your physical activity intentions into behavior.

Instructions

Please choose one preparatory action from the list in the table and formulate your own preparatory plan to increase your likelihood of being physically active.

References

de Bruijn, G., Nguyen, M. H., Rhodes, R. E., & van Osch, L. (2017). Effects of preparatory and action planning instructions on situation-specific and general fruit and snack intake. *Appetite*, *108*, 161–170. https://doi.org/10.1016/j.appet.2016.09.016

Preparatory Action	Time	Location	Type of Exercise	
Having the necessary equipment to exercise EXAMPLE	At the weekend,	while I'm out doing errands,	I will buy a yoga mat	**Where can you purchase any needed equipment?** at the yoga studio.
Taking exercise gear with me EXAMPLE	In the morning,	when I am leaving my home,	I will put my gym clothes	**Where can you place your gear?** in my backpack.
Placing exercise gear in a visible location EXAMPLE	After work,	when I get home,	I will put my running shoes	**Where can you place your gear?** near the front door.

Appendix 39.6 Implementation Intentions Interventions and Scripts

The following is one example of how implementation intentions were elicited in an intervention to increase fruit and vegetable intake (Chapman & Armitage, 2010):

We would like you to increase your daily intake of fruit and vegetables over the next 6 months. Research has shown that planning is more effective if you first identify a situation, then decide what you will do in that situation. For example, you might find it useful to state: "If it is lunchtime at university, then I will eat an apple instead of crisps!" Or you could choose to focus on planning where to buy fruit and vegetables or when and how you will prepare them. Please write your plans in the space provided, following the format in the example ("if … then …"). This was followed by a page of blank lines for the participants to formulate their own self-generated plans.

Hagger and colleagues (2012) used the following script to prompt implementation intention formation in an intervention to reduce alcohol consumption:

You are more likely to carry out your intention to keep your alcohol intake to within safe limits on each occasion or session if you make a decision about the time and place you will do so and how you plan to do it. Decide now when and where you will need to keep your alcohol intake to within safe limits and how you will do it. We want you to plan to keep your alcohol drinking to within safe limits on each occasion or session over the next month, paying particular attention to the specific situations in which you will implement these plans. For example, you may find it useful to say to yourself, "If I am in a bar/pub drinking with my friends and I am likely to drink over the daily safe limits for alcohol, then I will opt for a soft drink instead of an alcoholic drink to keep within the recommended safe limits." Please write your plans on the lines below, following the format shown in the previous example ("if … then …").

If …

_____

_____

Then I will …

_____

_____

References

Chapman, J., & Armitage, C. J. (2010). Evidence that boosters augment the long-term impact of implementation intentions on fruit and vegetable intake. *Psychology and Health*, *25*, 365–381. https://doi.org/10.1080/08870440802642148

Hagger, M. S., Lonsdale, A., Koka, A. et al. (2012). An intervention to reduce alcohol consumption in undergraduate students using implementation intentions and mental simulations: A cross-national study. *International Journal of Behavioral Medicine*, *19*, 82–96. https://doi.org/10.1007/s12529-011-9163-8

Appendix 39.7 Volitional Help Sheets

Volitional help sheets provide a standard tool that allow people to form personalized implementation intentions by linking critical situations to appropriate behavioral responses (Armitage 2008). Because generating good-quality plans may be difficult for some, volitional help sheets can prove useful as they provide a list of critical situations and potentially useful responses for behavior change. The following volitional help sheet was presented by Armitage (2008) to participants in a smoking cessation intervention:

Situations	Solutions
□ If I am tempted to smoke at a bar or pub having a drink	□ then I will think about something else
□ If I am tempted to smoke when I am desiring a cigarette	□ then I will tell myself I can quit if I want to
□ If I am tempted to smoke when things are not going the way I want and I am frustrated	□ then I will recall information people have given me on the benefits of quitting smoking
□ If I am tempted to smoke with my partner or close friend who is smoking	□ then I will tell myself that nonsmokers are asserting their rights
□ If I am tempted to smoke when there are arguments and conflicts with my family	□ then I will make sure I am rewarded by others if I don't smoke
□ If I am tempted to smoke when I am happy and celebrating	□ then I will stop to think that smoking is polluting the environment
□ If I am tempted to smoke when I am very angry about something or someone	□ then I will remember that warnings about the health hazards of smoking move me emotionally
□ If I am tempted to smoke when I experience an emotional crisis, such as an accident or death in the family	□ then I will remember that I get upset when I think about my smoking
□ If I am tempted to smoke when I see someone smoking and enjoying it	□ then I will remove things from my home or place of work that remind me of smoking
□ If I am tempted to smoke over coffee while talking and relaxing	□ then I will seek out someone who listens when I need to talk about my smoking
□ If I am tempted to smoke when I realize that quilting smoking is an extremely difficult task for me	□ then I will think about information from articles and ads about how to stop smoking
□ If I am tempted to smoke when I am craving a cigarette	□ then I will consider the view that smoking can be harmful to the environment
□ If I am tempted to smoke when I first get up in the morning	□ then I will tell myself that if I try hard enough I can keep from smoking
□ If I am tempted to smoke when I feel I need a lift	□ then I will tell myself that society is changing in ways that make it easier for nonsmokers

Continued

Cont.

Situations	Solutions
□ If I am tempted to smoke when I begin to be less concerned about my health and am less physically active	□ then I will remember that my need for cigarettes makes me feel disappointed in myself
□ If I am tempted to smoke with friends at a party	□ then I will seek out someone I can count on when I'm having problems with smoking
□ If I am tempted to smoke when I wake up in the morning and face a tough day	□ then I will do something else instead of smoking
□ If I am tempted to smoke when I am extremely depressed	□ then I will remember that I react emotionally to warnings about smoking cigarettes
□ If I am tempted to smoke when I am extremely anxious and stressed	□ then I will put things around my home or place of work that remind me not to smoke
□ If I am tempted to smoke when I realize I haven't smoked for a while	□ then I make sure I am rewarded by others if I don't smoke

In an intervention to increase physical activity among in people with low socioeconomic status, Armitage and Arden (2010) presented the following instructions and subsequent volitional help sheet:

We want you to plan to increase your level of physical activity. Research shows that if people can identify situations in which they are likely to be tempted not to be physically active and then link them with a way to overcome that temptation, they are much more likely to be successful in their intention to increase their level of physical activity. On the left-hand side of the page below are a series of common situations in which people feel tempted not to be physically active; on the right-hand side of the page are a series of possible solutions. For each situation that applies to you personally (left-hand side), please draw a line linking it to a solution (right-hand side) that you think might work for you. Please link one situation to one solution at a time, but make as many situation-solution links as you like.

Situations	Solutions
□ If I'm tempted not to be physically active when I'm under a lot of stress	□ then I will think about information from articles and advertisements on how to make physical activity a regular part of my life
□ If I'm tempted not to be physically active when I am depressed	□ then I will remember how warnings about the health hazards of inactivity move me emotionally
□ If I'm tempted not to be physically active when I am anxious	□ then I will think how I would be a better role model for others if I were more physically active
□ If I'm tempted not to be physically active because I feel I don't have the time	□ then I will think about how my inactivity affects those people who are close to me
□ If I'm tempted not to be physically active because I don't feel like it	□ then I will tell myself that being more physically active would make me a healthier, happier person to be around
□ If I'm tempted not to be physically active because I am busy	□ then I will tell myself that I will feel more confident in myself if I were more physically active

Continued

Cont.

Situations	Solutions
□ If I'm tempted not to be physically active because I am alone	□ then I will use physical activity to relieve my worries
□ If I'm tempted not to be physically active because I have to exercise alone	□ then I will think about all the people encouraging me to be more physically active these days
□ If I'm tempted not to be physically active because my exercise partner decides not to exercise that day	□ then I will make myself do some physical activity anyway because I know I will feel better afterward
□ If I'm tempted not to be physically active because I don't have access to exercise equipment	□ then I will tell myself that society is changing in ways that make it easier for people who want to be more physically active
□ If I'm tempted not to be physically active because I am travelling	□ then I will seek out someone on whom I can depend when I am having problems with keeping physically active
□ If I'm tempted not to be physically active because my gym is closed	□ then I will seek out someone who encourages me to be physically active when I don't feel up to it
□ If I'm tempted not to be physically active because my friends don't want me to exercise	□ then I will try to set realistic goals for myself rather than setting myself up for failure by expecting too much
□ If I'm tempted not to be physically active because my significant other does not want me to exercise	□ then I will tell myself that I am being good to myself by taking care of my body in this way
□ If I'm tempted not to be physically active because I am spending time with friends or family who do not exercise	□ then I will tell myself that I am the only one who is responsible for my health and well-being, and that only I can decide whether or not I am physically active
□ If I'm tempted not to be physically active because it's raining or snowing	□ then I will tell myself that if I try hard enough I can keep being physically active
□ If I'm tempted not to be physically active because it's cold outside	□ then I will put things around my home to remind me to be physically active
□ If I'm tempted not to be physically active because the roads or pavements are icy/snowy	□ then I will keep things around my place of work that remind me to be physically active
□ If I'm tempted not to be physically active because I feel I don't have the time	□ then I will think how I would be a better role model for others if I were more physically active
If I'm tempted not to be physically active because I am spending time with friends or family who do not exercise	□ then I will tell myself that I am being good to myself by taking care of my body in this way

References

Armitage, C. J. (2008). A volitional help sheet to encourage smoking cessation: A randomized exploratory trial. *Health Psychology*, *27*, 557–566. https://doi.org/10.1037/0278-6133.27.5.557

Armitage, C. J., & Arden, M. A. (2010). A volitional help sheet to increase physical activity in people with low socioeconomic status: A randomised exploratory trial. *Psychology and Health*, *25*, 1129–1145. https://doi.org/10.1080/08870440903121638

Appendix 39.8 Example Implementation Intention Intervention

We would like you to begin bringing your reusable bags to the grocery store. Research has shown that if we identify a situation, then decide what to do in that situation, we may be more likely to turn our intentions into actions. For example, statements such as the following can be useful: "If I walk out the door to the grocery store then I will grab a reusable bag." Please write your plans to use your reusable bags in the space provided, following the format provided in the previous example ("if … then …").

EXAMPLE If I walk out the door to the grocery store,	then I will grab a reusable bag.
If …	Then …

Appendix 39.9 Coping Planning Interventions

The following script for a pen-and-paper coping planning intervention was developed to encourage regular physical activity among cardiac rehabilitation patients (Sniehotta, Scholz, & Schwarzer, 2006):

Which obstacles or barriers might interfere with the implementation of your exercise plans? How could you successfully cope with such problems? Please write down your plans in the following table. The more precise, concrete and personally you formulate your plans, the more they will help you.

The following outlines the method for an online intervention implementing coping planning to enhance regular sunscreen use in women (Craciun et al., 2012):

A message about the utility of coping plans and a short example of coping planning for sunscreen use followed. Participants were asked to think about three obstacles that would interfere with using sunscreen and then come up with three strategies that would help them overcome these barriers. Using the information the participants provided, the computer program generated three coping plans. The opportunity was given to correct these coping plans if the respondents were not satisfied with the way they had formulated them.

Identifying tempting situations beforehand and having participants form coping plans for each precomposed risky situation is an alternative approach. Luszczynska and colleagues (2007) provided the following script and three prompts in an intervention to enhance weight reduction:

Many situations may tempt you to eat something that you had not meant to. Make a plan about how you would react to these risky situations and fill in the form. The form provided the following three prompts:

I have my own plan that will help me to maintain my healthy diet. If I am hungry, then instead of eating an unhealthy snack I plan to … (write down what you plan to do).

If someone offers me my favorite unhealthy food then in order not to eat it I plan … (write down what you plan to do).

If I meet with my friends or family over dinner, then in order to eat healthy food I plan … (write down what you plan to do).

Inuan and Mosler (2016) included coping planning as part of their intervention to promote safe water consumption. They made their intervention and protocol materials available.

References

Craciun, C., Schüz, N., Lippke, S., & Schwarzer, R. (2012). Facilitating sunscreen use in women by a theory-based online intervention: A randomized controlled trial. *Journal of Health Psychology*, *17*, 207–216. https://doi.org/10.1177/1359105311414955

Inauen, J., & Mosler, H. (2016). Mechanisms of behavioural maintenance: Long-term effects of theory-based interventions to promote safe water consumption. *Psychology and Health*, *31*, 166–183. https://doi.org/10.1080/08870446.2015.1085985

Luszczynska, A., Sobczyk, A., & Abraham, C. (2007). Planning to lose weight: Randomized controlled trial of an implementation intention prompt to enhance weight reduction among overweight and obese women. *Health Psychology*, *26*, 507–512. https://doi.org/10.1037/0278-6133.26.4.507

Sniehotta, F., Scholz, U., & Schwarzer, R. (2006). Action plans and coping plans for physical exercise: A longitudinal intervention study in cardiac rehabilitation. *British Journal of Health Psychology*, *11*, 23–37. https://doi.org/10.1348/135910705X43804

Coping Planning

Instructions for promoters

Description
A coping plan is an intervention to anticipate barriers to collecting arsenic-safe water and make plans, how to overcome them in order to keep collecting arsenic-safe water. Participants are asked to think of three barriers that may interfere with their commitment to collect arsenic-safe water. Promoters then assist participants to make plans (one plan for each barrier), how to overcome the barriers.

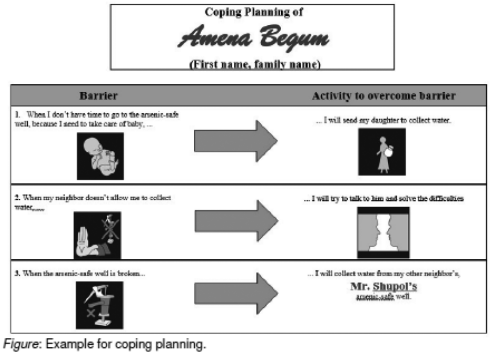


Figure: Example for coping planning.

Procedure

1. Take two empty coping planning forms and a set of picture stickers.
2. Explain to the participant about coping planning:
   - "Sometimes, although we plan to do something, other things come in the way. For example, you want to go to collect drinking water at your neighbor's arsenic-safe well, but then you need to start cooking and don't have time to go.
   - Today, I would like assist you to find some barriers that may hinder you sometimes to collect arsenic-safe water. And, together with you, let's find some activities, how to overcome these barriers, so you can still collect arsenic-safe water.
   - Do you agree?"
   - If the participant agrees, ask the following questions and fill in the answers into the coping planning form by attaching the respective sticker pictures to the form, or by drawing pictures if needed:

     a) What kind of activities interfere sometimes with your plan to collect water from your neighbor's arsenic-safe tubewell / the deep tubewell (or any other arsenic-safe water option the person uses --> check your manual for arsenic-safe water options!)?

     → Try to make the participant think carefully about this to come up with up to three barriers of her / his own.

     → If, after you have encouraged the participant to think several times, the participant hasn't found three barriers, offer some possible barriers from your "Possible barriers and how to overcome them" list. But don't force the participant to choose any barriers!

     → Attach the respective barrier picture stickers in the column named "Barrier" on the form.

     b) You have now mentioned several barriers that sometimes interfere with your goal to collect arsenic-safe water. Let's now find some activities, how you can overcome each barrier.

     → For each barrier, ask the participant to think of one activity to overcome this barrier.

     → If the participant doesn't have ideas, how to overcome the barriers, try to help by making suggestions for activities. You can also consult your "Possible barriers and how to overcome them" list for ideas.

     → Make sure that the activities to overcome the barriers will allow the participant to keep collecting arsenic-safe water!

     → Make sure you choose activities that the participant is willing to do to overcome the barriers!
3. Documentation: Copy the filled-in coping planning form to the second empty form by writing down each barrier and the corresponding activity to overcome them.
4. Read the completed coping planning form to the participant in this way:

   → "When (barrier X) occurs, I will do (activity Y)".

   → For example: "When the arsenic-safe well is broken (=barrier), I will go to collect water at my other neighbor's arsenic-safe well (=activity to overcome the barrier)".
5. Ask the participant to repeat each statement after you.
6. Ask the participant to keep the coping planning form somewhere safe.
7. Thank participant for her time and answer any remaining questions.

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Coping Planning of

.....

(First name, family name)

Barrier	Activity to overcome barrier
1.	
2.	
3.	

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Appendix 39.10 Example Coping Planning Worksheet for Academic Improvement

Description

Coping plans are reserve plans that can be used to increase the chances of studying in the face of expected difficulties. They involve anticipating barriers that may interfere with studying behavior. By identifying potential barriers that could impede studying, we can develop strategies to overcome these obstacles.

Example

For example, if you identified friends asking you to hang out together as a barrier to your studying, a possible coping plan might look like this:

If my friends ask to get together, I will say no, I have to study and head straight to the library.

Instructions

1. Which obstacles or difficulties might occur that would interfere with your studying behavior? Please list them in the first column.
2. Think of one strategy to overcome each potential barrier to studying and list them in the second column.

Barrier	Strategy to overcome barrier
1.	
2.	
3.	

Appendix 41.1 An Illustrative Example of a Habit (Formation And Substitution) Intervention

Table A41.1.1 Behavior change techniques used in "On Your Feet To Earn Your Seat," a sitting-reduction intervention for older adults (Gardner et al., 2014; Matei et al., 2015; White et al., 2017)

Booklet Section	Informational Content / Behavior Change Recommendations[a]	Specific Physical Activity Forms Targeted in Tips	Behavior Change Techniques[b]
Motivational text	– Regular PA in older age protects physical and mental health. – PA includes aerobic, stretching, balance, and strengthening. – Sitting time is a risk factor for physical health. – Limiting sitting to 20 mins may protect health. – Context-dependent repetition forms habit, which can maintain behavior.	N/A	Information on health consequences; Framing/reframing; Habit formation
Tips	"1. Leave the house daily: Ensure that you go out at least once a day. […] Don't hesitate to use a stick if you need to."	No explicit PA form, but conducive to standing (balance) and walking (aerobic)	Action planning; Goal setting (behavior); Adding objects to the environment
	"2. Make ad breaks active: When you watch TV, stand up or walk around during breaks between programmes. […] Try to watch TV for no more than one hour at a time, including two active breaks. Leave the remote control by the TV so that you have to get up to change channel."	Standing (balance) Walking (aerobic)	Prompts/cues; Goal setting (behavior); Restructuring the physical environment; Habit formation
	"3. Take a stand: Stand up when waiting for a bus or train. Stay standing as long as possible. […] Make the sight of an empty seat a reminder to stand up."	Standing (balance)	Prompts/cues; Framing/reframing; Habit formation; Habit reversal
	"4. Time to stretch: When sitting for long periods … set an alarm to go off every 20 minutes. When it rings, stand up and stretch, reaching your arms as high up as you can a few times. Hold each stretch for 10 seconds."	Standing (balance) Stretching (flexibility)	Prompts/cues; Restructuring the physical environment; Instruction on how to perform the behavior; Habit formation

Continued

Table A41.1.1 Cont.

Booklet Section	Informational Content / Behavior Change Recommendations[a]	Specific Physical Activity Forms Targeted in Tips	Behavior Change Techniques[b]
	"5. Rising and sinking: When standing by the sink in the kitchen … stand on your tip toes and then slowly drop back down onto your heels. Hold on to the counter if you need more support. Do this five times at first, and build up to 30."	Standing (balance) Stretching (flexibility)	Instruction on how to perform the behavior; Prompts/cues; Habit formation
	"6. Watch your step: Try to do at least 30 minutes of walking in total over the course of the day. This is equivalent to walking 1500 steps at a normal pace. You could start by aiming for 10 minutes (500 steps), and gradually build it up over time. […] Use a watch to time how long you spend walking. […] Look for opportunities to increase your steps, e.g. – take the lift to one floor below your destination and walk up the last staircase; – walk around your home when on the phone; – park further away from the supermarket entrance; – get off the bus a stop or two early; – find a slightly longer route to get home; – when meeting friends, go for a walk together rather than sitting down – make more frequent shopping trips."	Walking (aerobic)	Goal setting (behavior); Action planning; Graded tasks; Self-monitoring behavior; Behavior substitution
	"7. Sit to stand with no hands: Each time you stand up, try doing it without using your hands. Make sure your feet are flat on the floor and your chair is sturdy. […] As you get up, try holding your position a few inches above the chair and count to ten. You could also try standing up and then sitting back down again, gradually doing more as it becomes easier."	Standing (balance) Weight-bearing (muscle-strengthening)	Instruction on how to perform behavior; Graded tasks; Habit formation

Continued

Table A41.1.1 Cont.

Booklet Section	Informational Content / Behavior Change Recommendations[a]	Specific Physical Activity Forms Targeted in Tips	Behavior Change Techniques[b]
	"8. Improve your posture: […] Stand with your back to the wall with your heels two inches from it. With your chin tucked in, move the back of your head towards the wall. Try to push the small of your back against the wall. Count to five, then repeat."	Posture (flexibility)	Instruction on how to perform behavior
	"9. Limber up: Do these physical activities in the same order each morning, at your own pace: 9a. Calf stretch 9b. Chest stretch 9c. Walk as if on a tightrope across the floor 9d. March on the spot 9e. Walk your fingers up the wall 9f. Lift a tin of food in each hand. Handy hint: Every evening, leave this booklet on your armchair or on the kitchen table to remind you to use it the next day."[c]	Stretching (flexibility) Stretching (flexibility) Stretching (flexibility) Balance Marching (aerobic) Stretching (flexibility) Weight-bearing (muscle-strengthening)	Instruction on how to perform behavior; Demonstration of behavior; Graded tasks; Prompts/cues; Restructuring the physical environment; Habit formation
	"10. Wall push-ups: do 10 push-ups against a wall each morning. […] As your arms strengthen, increase the number of push-ups you do, resting for 1–2 minutes after every 10 push-ups."	Weight-bearing (muscle-strengthening)	Instruction on how to perform behavior; Demonstration of behavior; Graded tasks
Habit-formation advice	Importance of: – planning how, when and where to enact behavior. – increasing PA intensity gradually. – repeating behavior in stable settings – continuing repetition after missed opportunities – self-monitoring performance	N/A	Action planning; Graded tasks; Habit formation; Self-monitoring behavior

Continued

Table A41.1.1 Cont.

Booklet Section	Informational Content / Behavior Change Recommendations[a]	Specific Physical Activity Forms Targeted in Tips	Behavior Change Techniques[b]
Misc advice	– Respond to urges to sit by reviewing whether "you have done enough to have earned that seat," i.e. at least 10 consecutive minutes of PA. – Monitor improvements in physical functioning arising from adherence to tips.	N/A	Framing/reframing; Prompts/cues; Goal setting (behavior); Self-monitoring outcome of behavior
Supplementary tick sheets	Daily self-monitoring record	N/A	Self-monitoring behavior; Self-monitoring outcome of behavior

Note. This table is reproduced from White et al. (2017), Supplementary Table 1. [a]Tip descriptions are not comprehensive. Only text explicitly describing a behaviour change recommendation is included in this table; justifications or explanation of tips are not provided. [b]Behavior change content as mapped onto the behavior change technique taxonomy version 1 (BCTTv1; Michie et al., 2013). [c]Activities outlined in Tips 9a–9 f and Tip 10 were outlined with extensive instructions and photographs, modeled by a female aged sixty-six years, to illustrate ergonomically correct procedures.

References

Gardner, B., Thune-Boyle, I., Iliffe, S. et al. (2014). "On Your Feet to Earn Your Seat": A habit-based intervention to reduce sedentary behaviour in older adults: Study protocol for a randomized controlled trial. *Trials*, *15*, 368. https://doi.org/10.1186/1745-6215-15-368

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Appendix 43.1 Example Materials from a Text Message Dyadic Action Control Intervention

Table A43.1.1 Full list of all action control text messages for all participants (translated from German)

No.	Time	Experimental Group I & II (Target persons)*	Experimental Group I (Partners)	All others
1	11:50 AM	Dear _____: This text message is a reminder on your intentions to be physically active for 30 minutes each day. Best wishes, [partner]/the study team	Dear _____, please send the **1st text message** within the next hour to your partner, and remember to fill in the diary on the smartphone tonight before going to bed. Many thanks, the study team	Dear _____, please remember to fill in the diary on the smartphone tonight, within one hour before going to bed. Many thanks, the study team
2	2:15 PM	Dear _____: Which of your intentions for your physical activity have you already carried out today? Best wishes, [partner]/the study team	Dear _____, please send the **2nd text message** within the next hour to your partner, and remember to fill in the diary before going to bed. Many thanks, the study team	Same as message 1.
3	10:55 AM	Dear _____: If you haven't achieved your goal of 30 minutes physical activity today, there will certainly still be a good opportunity for it. Best wishes, [partner]/the study team	Dear _____, please send the **3rd text message** within the next hour to your partner, and remember to fill in the diary before going to bed. Many thanks, the study team	Same as message 1.
4	4:55 PM	Dear _____: Do you have your intentions for the daily activity still in mind? Best wishes, [partner]/the study team	Same as messages above referring to **4th** message	Same as message 1.

Continued

Table A43.1.1 Cont.

No.	Time	Experimental Group I & II (Target persons)*	Experimental Group I (Partners)	All others
5	4:25 PM	Dear _____: Think about how often you have already engaged in at least 10 minutes of physical activity today. How many minutes are still missing? Best wishes, [partner]/the study team	Same as messages above referring to **5th** message	Same as message 1.
6	9:30 AM	Dear _____: Haven't you been as active as intended today? Use the rest of the day to achieve your goal. Best wishes, [partner]/the study team	Same as messages above referring to **6th** message	Same as message 1.
7	11:10 AM	Dear _____: You have intended to be physically active each day, namely at least 3x10 minutes at a stretch. Best wishes, [partner]/the study team	Same as messages above referring to **7th** message	Same as message 1.
8	11:55 AM	Dear _____: Have you been as active today as you intended to be? Best wishes, [partner]/the study team	Same as messages above referring to **8th** message	Same as message 1.
9	3:05 PM	Dear _____: Try to stick with your intentions for your physical activity today. Best wishes, [partner]/the study team	Same as messages above referring to **9th** message	Same as message 1.
10	2:25 PM	Dear _____: Today, keep an eye closely on whether you are physically active long and intensive enough. Best wishes, [partner]/the study team	Same as messages above referring to **10th** message	Same as message 1.

Note. *In the experimental group I (dyadic action control group) the text messages are sent by the partners. The content is unchanged, but partners have the opportunity to adapt the message to their own Swiss-German dialect and personalize their greetings. In the experimental group II (individual action control group) the text messages are sent by the study personnel.

References

Scholz, U., & Berli, C. (2014). A dyadic action control trial in overweight and obese couples (DYACTIC). *BMC Public Health*, *14*, 1321. https://doi.org/10.1186/1471-2458-14-1321

Appendix 43.2 Example of the Collaborative Planning Sheet

Please read these instructions together.

Many people decide to be more active in sport, but often forget this intention. It has been found that plans help to act according to the intention. In addition, you both will be more active if you formulate very concrete plans, WHEN, WHERE and HOW you want to be physical active together.

It is therefore helpful for you to plan on which weekdays, at what time and on which occasions you want to be active in sports over the next 7 days. **The more precise, concrete and personal you formulate these plans together**, the more they will help you!

Example:

Plans could look like this:

"**If** it's Saturday 11:00 o`clock, **then** we'll cycle around the lake "Pfäffikersee" for 20 minutes."

Or

"**If** school is out (every day from Mo to Fri), **then** we will go jogging in the forest for 30 minutes."

For these examples, the following would be entered in the table:

Now it's your turn

Now think about **WHEN** (weekday/time) the both of you want to be physically active during your free time so that you get out of breath and start sweating. Afterwards, **WHERE** (place/what opportunity) you two want to be physically active and **HOW** (sport/duration) both of you want to be physically active. Please consider up to **3 plans** and make sure that both of you are physically active (including school sports, sports in a club, etc.) for at least 60 minutes per day. You can collect your ideas on a piece of paper.

Please note that a good plan for physical activity should meet 4 criteria:

1. Do your plans fit to you?
2. Do your plans help you to be physically active for at least 60 minutes per day?

WHEN (Time)	WHEN (Weekday(s))	WHERE (places/occasions)	HOW (type of sport)	HOW long (in minutes)
During the next 7 days, we will be physically active at the following times …	… on the following weekday(s) …	…. at the following places / opportunities …	… in this way and for …	… ___minutes.
1. at **11:00** o'clock	**Saturday**	**Pfäffikersee**	**Ride our bycicles**	**20 minutes**
Our 1st plan: **If it is Saturday 11.00 o'clock, then we'll cycle around the lake Pfäffikersee for 20 minutes.**				
2. **After school**	**Mo to Fr**	**forest**	**Jogging**	**30 minutes**
Our 2nd plan: **If school is out, then we will go jogging in the forest for 30 minutes.**				

3. Can your plans be integrated into your daily routine?
4. Are your plans accurate and complete?

Please formulate your plans in a way that you can answer all questions with Yes.

If you have agreed on your joint plans, please write down **When**, **Where** and **How** you want to be physically active together in the boxes below. Afterwards, please formulate your plans according to the If-Then format (If situation X is …, then we will initiate Y). Please also see the examples on page 1. If you need any help or if you have no ideas, please contact the experimenter.

WHEN (Time)	WHEN (Weekday(s))	WHERE (places/occasions)	HOW (type of sport)	HOW long (in minutes)
During the next 7 days, we will be physically active at the following times …	… on the following weekday(s) …	…. at the following places / opportunities …	… in this way and for …	… ___minutes.
1. At _____ o'clock **Our 1st plan:** **If_____, then_____**				
2. At_____ o'clock **Our 2nd plan:** **If_____, then_____**				
3. At_____ o'clock **Our 3rd plan:** **If_____, then_____**				

As soon as you finished making your plans, please contact the experimenter.

Instructions and examples

It is particularly useful, in addition to the plans you now already have, if you consider which situations could make it difficult for you to transfer your planned physical activities into action and how you can handle such critical situations.

Please write down which situations could most likely compromise your plans described above (e.g., conflicting appointments or broken sports equipment) and how you could handle such situations to still translate your plans into action.

Example:

*"**If** one of our bikes is broken, **then** we'll go swimming in the indoor pool in town for 30 minutes."*

*"**If**, for once, we don't have time after school, **then** we'll go skating for 30 minutes in the evening after finishing our homework."*

For these examples, the following would be entered in the table:

Now it's your turn

First think about **critical situations or barriers** that could make it difficult for the two of you to translate your planned sports activities into action.

Afterwards consider how you could handle these critical situations/barriers and write down your plans. Again, you can first collect ideas and write them down on a piece of paper.

Situation	HOW?
What barriers can occur?	How can you handle this situation?
1. **Broken bike**	1. **Swimming in the indoor pool**
Our 1st plan:	
If one of our bikes is broken, then we'll go swimming for 30 minutes in the indoor pool in town.	
2. **No time after school**	2. **Alternative date after homework**
Our 2nd plan:	
If we don't have time after school, then we'll go skating for 30 minutes in the evening after finishing our homework.	

Critical situations	HOW?
Which barriers can occur?	How can you handle this situation?
1.	1.
Our 1st plan:	
If_____**,then**_____**.**	
2.	2.
Our 2nd plan:	
If_____**,then**_____**.**	
3.	3.
Our 3rd plan:	
If_____**,then**_____**.**	

As soon as you finished making your plans, please contact the experimenter.

The more precise, concrete and personal you formulate these plans jointly, the more they will help you!

Your plans should meet three criteria.

1. Are these really your main barriers for your plans?
2. Are your solutions suitable to overcome the barriers?
3. Can your plans be integrated into your daily routine?

Please formulate the plans so that you can answer all questions with Yes.

If you have agreed on your joint plans, please write down what **barriers** might occur and how you can **handle these situations** in the boxes below. Afterwards, please formulate your plans according to the **If-Then format** (If situation X is …, then we will initiate Y.). Please also see the examples on page 3. If you need any help or if you have no ideas, please contact the experimenter.

References

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Appendix 44.1 Complexity in Group-Based Interventions

Behavior change interventions have traditionally been considered complex in nature (see Craig et al., 2008), with complexity arising as a consequence of interactions between intervention components (e.g., number of behavior change techniques employed and outcomes targeted). However, complexity may also arise due to wider "system-level" properties, with practical considerations such as the training needs of intervention facilitators, the intervention context (e.g., community hall, hospital, gym), and length of intervention all contributing to the complexity of an intervention (see, e.g., Borek et al., 2019). When the mode of delivery is the group, complexity also arises from the group processes that emerge from the development of shared social identity and which structures the intervention outcomes. Group interventions informed by the social identity approach therefore need to focus not only on changing the targeted behaviors (e.g., promoting physical activity) but also on understanding and managing these system-level influences.

A major focus of the step-by-step guide to building group-based interventions presented in Chapter 44, this volume, is how to establish and manage social identity among intervention recipients in the face of this complexity. Complexity should be accounted for at various stages including the design, delivery, and evaluation of an intervention (Craig et al., 2008; Greenhalgh & Papoutsi, 2018). At the *design* stage, there should be a systematic and incremental development of the intervention to ensure that it is built on robust theoretical underpinnings (i.e., social identity principles), including a consideration of aspects of the population group that may shape social identity formation (e.g., past experiences, expectations). In *delivering* the intervention, group facilitators need to prepare the group members for change by both understanding and helping the group clarify its values (to give meaning to the new intervention social identity) that support change and also monitoring social identity dynamics across the program. Through *evaluation,* practical questions about intervention processes and delivery (e.g., social identity development and engagement with the intervention group; facilitator fidelity to the intervention manual) should be addressed as well as more definitive tests of effectiveness (i.e., whether the group intervention effectively changes behavior) ahead of wider intervention implementation.

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Appendix 44.2 Measures of Social Identification

Several indices exist that reliably measure social identification (see reviews by Jetten, Haslam, & Haslam, 2012; Haslam et al., 2018). The most widely used measure was developed by Doosje, Ellemers, and Spears (1995) and involves group members indicating their level of agreement using a Likert scale with four items that tap into their emotional and cognitive attachment to the group (e.g., "I see myself as a member of [group name] group"; "I am pleased to be a member of [group name] group"). A single-item measure ("I identify with my group") has since been validated (Postmes, Haslam, & Jans, 2013) and this may have particular utility in studies where respondent burden is an issue (e.g., due to the number of other process and outcome measures being administered). The inclusion of the in-group in the self scale (Tropp & Wright, 2001) is a pictorial tool for assessing identification, which could also be of use in some settings (e.g., when comprehension is an issue). Based on the inclusion of other in the self scale developed by Aron et al. (1991), the inclusion of the in-group in the self scale comprises a series of Venn-like diagrams, in which two circles vary in the degree to which they overlap, from no overlap at all (represented by two distinct circles) to almost complete overlap. Participants choose the diagram that best represents the relationship between themselves and the group as a whole (with greater overlap of the two circles indicating a closer relationship, or *higher identification*).

Qualitative approaches (e.g., interviews with intervention recipients) can also usefully explore social identity processes in intervention (see Tarrant et al., 2016, 2017). It can be the case that characteristics of the target population require researchers to utilize other, nonintrusive, approaches to assess intervention processes – for example, through observation of group sessions in interventions for people with cognitive impairment or restricted language capacity. The implementation example provided in Chapter 44, this volume, includes one such approach (see also Appendix 43.3).

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Appendix 44.3 Description of the Singing for People with Aphasia Trial

Background to the Study

About one-third of people affected by stroke each year in the UK will acquire aphasia. Guidelines recommend that rehabilitation programs should integrate people with aphasia back into the community and into social roles in order to improve psychosocial health but there is a notable lack of opportunities for people with aphasia in this regard. There is a growing interest in the potential benefits of group interventions, including those focused on music making and singing, for those with long-term conditions such as stroke. This interest is partly driven by increasing pressure on health care resources (i.e., increasing numbers of people with chronic conditions) and presumed cost-effectiveness of group-based care. With an established evidence base highlighting the important role of groups – and social identity processes – in shaping health (see Haslam et al., 2018), the wider therapeutic benefits of group-based interventions are starting to be recognized in practice. One such intervention – Singing for People with Aphasia (SPA) – was developed and evaluated (Tarrant et al., 2018; Tarrant, Carter, Dean et al., 2019) in order to address the question: *Do singing groups for people with post-stroke aphasia improve well-being?*

The "PICO" framework was used to organize the study. This framework articulates (1) the *Population* targeted by the intervention, (2) what the *Intervention* is, (3) the *Comparator* against which the intervention is evaluated (if the intervention is being evaluated), and (4) the *Outcome*(s) that the intervention is targeting (e.g., the change behavior). For the SPA trial, the PICO was as follows:

Population:	Individuals with post-stroke aphasia
Intervention:	A ten-week singing group intervention
Comparator:	Stroke survivors with aphasia who do not attend any singing groups or lifestyle intervention
Outcome:	Well-being

Study Design and Participants

Eligible and consenting participants (N = 41) were individually randomized, using a web-based randomization service supported by the Exeter Clinical Trials Unit, 1:1 to receive either a ten-week group singing program along with a resource booklet (intervention) or a resource booklet only (control). Baseline and outcome measures (including well-being, stroke and aphasia quality of life, and social participation) were taken on three occasions: baseline, three months, and six months.

Delivery Planning

Meetings with stroke survivors and their partners and carers informed a range of decisions concerning the project, from study population, participant recruitment, intervention content, and intervention delivery. A scoping review of the literature identified several uncontrolled studies and studies employing qualitative methods that suggested potential benefits of group singing on well-being (e.g., Clift & Hancox, 2010; Dingle et al., 2013; Tamplin et al., 2013). These studies informed the intervention design.

A "dry run" of the first session was conducted with a group of people with aphasia (see Tarrant et al., 2016), which helped refine the intervention. For example, the original plan was for singing sessions to have a fifteen-minute coffee break on an assumption that participants would want quickly to recommence singing/music making. However, the dry run established that the coffee break was a valuable activity in itself supporting group formation (by providing further opportunities for members to connect naturally) and this element was built into the subsequent intervention design. Indeed, in the subsequent trial, the group facilitators frequently used the coffee break to initiate, and later revisit, group discussions about group progression in terms of singing and group goal formation but also to encourage the sharing of personal experiences. Moreover, it was during these breaks that the research team observed many actions that flow from sharing a social identity (e.g., individual members comforting and supporting one another).

For the main trial, group facilitators were provided two days training prior to delivering the intervention, including input from an aphasia expert and a speech and language therapist on how to communicate effectively with people with aphasia. A "quick reference guide" was produced for facilitators to use as a prompt within sessions, addressing Practitioner Points 1 and 2 in particular. The guide detailed the most important aspects of session delivery, useful tips, answers to common questions, and general housekeeping. The mnemonic "SPA ENGAGE" was presented within the quick reference guide to reiterate the intervention focus on building and maintaining participants' social identity (see Table A43.3.1).

Evaluation: An Exploratory Approach to Analyzing Social Identity Development

Full details of the evaluation are provided in Tarrant, Carter, Backhouse et al. (2019). The focus in this section is on describing the aspect of the process evaluation that assessed the potential for the intervention to create a sense of social identity among singing group recipients.

Repeated measurement of social identification was not feasible due to the burden this would place on group members, in addition to completing study outcome measures. A novel approach to assessing this variable was therefore employed involving analysis of video recordings of the singing groups. Each session recording was split into ten-minute segments, resulting in around 250

Table A44.3.1 The "SPA ENGAGE" mnemonic (from *The Singing for People with Aphasia Trial Quick Reference Guide for Facilitators*)

SPA ENGAGE (the **Singing for People with Aphasia** Motto)	
S	**S**upport and encourage
P	**P**romote group identity (though inclusive language)
A	**A**llow group choice (of songs)
E	**E**ncourage social interaction
N	**N**urture group goal(s) achievement
G	**G**enerate self-monitoring and reflection on progress
A	**A**ctively encourage participation by all (enablement)
G	**G**ive positive feedback on progress
E	**E**xplore health benefits of the group/Explore outside experiences

segments in total. An independent coder was trained to code each segment using two scales:

1. The Budman et al. (1987) Harvard Community Health Plan Group Cohesiveness Scale (HCHP-GCS), comprising six subscales: *interest and involvement* of group members, *trust*, *cooperation*, *expressed caring*, *focus*, and *global cohesion*. Conceptually, the HCHP-GCS taps into an expression of shared social identity, with individuals coming together *as a cohesive group* (as opposed to acting as a distinct set of individuals). For the present analysis, video segments were coded using the *global group cohesion* subscale, which addressed the extent to which the group members appeared united and purposeful, and demonstrated a clear sense of "weness" – as opposed to demonstrating group fragmentation through individualistic behavior (see Budman et al., 1987, p. 81).
1. The "Inclusion of the Ingroup in the Self" scale (Tropp & Wright, 2001). The independent coder rated each segment according to the degree to which the group members *overall* appeared connected – with greater overlap of the two circles indicating that the group came together more as a group. Figure A43.3.1 illustrates this scale.

The video segments were randomized prior to coding to ensure that raters remained blind as to the position of the segment within the singing program. After coding, the segments were reorganized into their original order for analysis, which considered the progression of social identification across the group intervention.

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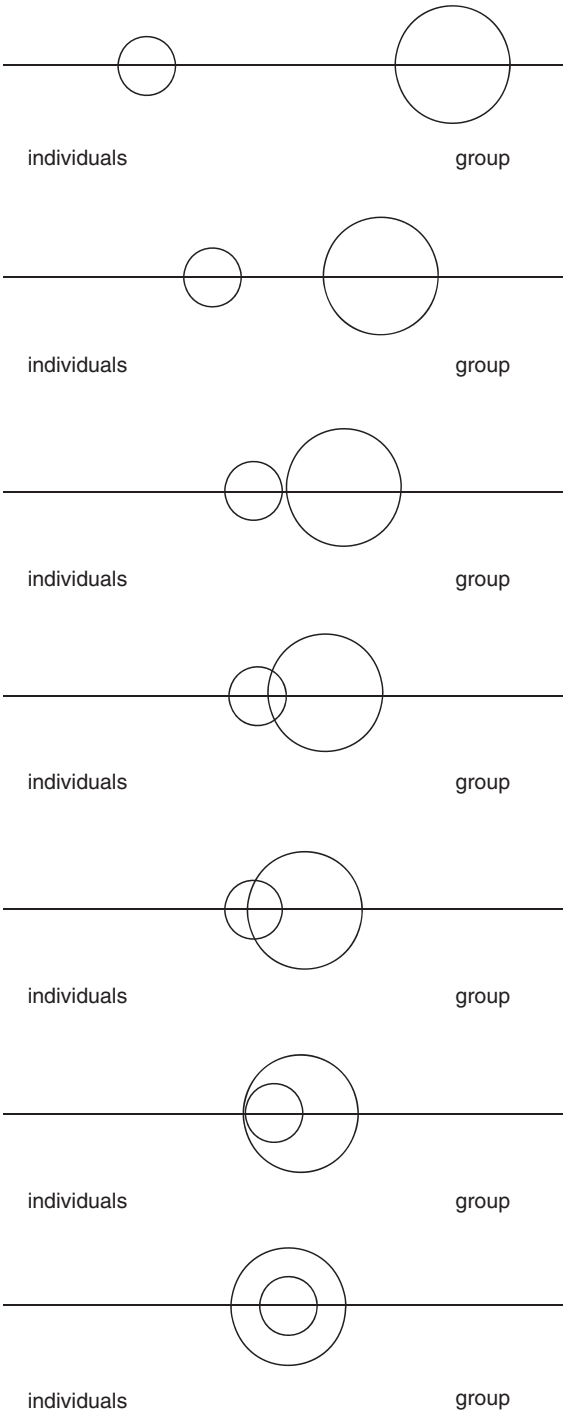

Figure A43.3.1 Measure of shared social identity used in the singing for people with aphasia trial (adapted from Tropp & Wright, 2001)

Appendix 45.1 Motivational Interviewing Techniques

As noted in Chapter 45, motivational interviewing (MI) consists of relational and technical components for inducing and enhancing inherent motivation for specific behavioral change (Miller & Rose, 2009). Relational techniques are intended to engage the client within a context of partnership, acceptance, and compassion. Technical aspects are intended to evoke and reinforce specific client language (i.e., change talk). Particularly useful relational and technical MI techniques are presented in Table A45.1.1. The example conversations in Appendix 45.4 demonstrate how these techniques are used in practice.

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Table A45.1.1 Particularly useful motivational interviewing (MI) techniques

Technique	Definition
OARS	
Open-ended questions	Open-ended questions prompt conversation by allowing the client to answer with more than a single word or a phrase. They are phrased to facilitate dialogue and engage the client in the conversation. Strategic use of open-ended questions also serves as a goal-directed technique within MI (i.e., to evoke and reinforce change talk and/or to soften sustain talk).
Affirmations	Affirmations are genuine, supportive statements used to verify and acknowledge the client's strengths, efforts, intentions, or worth. They are a key element in facilitating and supporting client self-efficacy.
Reflections	Reflections are paraphrases that capture the core meaning communicated (explicit or implicit) by the client. It is perhaps the most vital skill in MI. They give the client feedback on the practitioner's understanding of what has been said and communicate the practitioner's understanding from the client's perspective. By strategically including and/or excluding content, reflections can also serve as a goal-directed technique within MI (i.e., to evoke and reinforce change talk and/or to soften sustain talk).
Summaries	Summaries are a special type of reflection where the practitioner recapitulates the main points or issues raised by the client. They allow both parties to review and serve as a guide to the next step. Summaries can also be used strategically to highlight certain content and/or to shift the client's attention or direction.

Continued

Table A45.1.1 Cont.

Technique	Definition
Additional techniques	
Asking permission	Asking permission is a process by which the practitioner receives permission from the client before providing information or advice. Thus, the practitioner explicitly shares power and acknowledges the client's expertise.
Agenda mapping	Agenda mapping is a short exercise where the client chooses from a menu of options. It is typically used at the beginning of an MI session to help the practitioner and client collaboratively establish a focus for the session.
Elicit-provide-elicit	Elicit-provide-elicit is a way of providing information to clients that begins and ends with an exploration of the client's own knowledge, thoughts, and/or experience. This process can help engage the client and allows the practitioner to adapt the information to the client's situation and/or needs.
Rulers	Rulers are self-evaluation tools for assessing clients' position with respect to three different aspects of motivation (i.e., importance, confidence, and readiness) on a scale from 1 (i.e., not at all) to 10 (i.e., 100 percent). They can give useful information, to both the client and the practitioner, regarding the client's level of motivation for change and thereby provide guidance for the subsequent session.

Note. OARS = open questions, affirmations, reflections, and summaries.

Appendix 45.2 Motivational Interviewing Coding Instruments

Table A45.2.1 summarizes a selection of motivational interviewing (MI) coding instruments at the time Chapter 45 was written, including those mentioned in the chapter text as well as instruments adapted for special disciplines, settings, behaviors, or formats. The Behavior Change Counselling Index (BECCI; Lane, 2002) and the Motivational Interviewing Assessment Scale (MIAS; Campiñez Navarro, 2016) are specialized for assessing MI integrity in primary health care. The Motivational Interviewing Scenarios Tool for Eating Disorders (MIST-ED; Sepulveda et al., 2013) was developed to assess beginner MI skills among practitioners treating adolescents with eating disorders and the Assessment of Motivational Interviewing Groups – Observer Scales (AMIGOS; Wagner & Ingersoll, 2017) was developed to assess MI fidelity in a group format.

Table A45.2.1 Selected summary of motivational interviewing (MI) coding instruments

Instrument	Reference	Primary Purpose	Brief Description	No. of Assessed Variables
Assessment of Motivational Interviewing Groups – Observer Scales (AMIGOS)	Wagner & Ingersoll (2017)	Research and training/ supervision	Assess MI group leadership and group processes in MI group counseling	18
Behaviour Change Counselling Index (BECCI)	Lane (2002)	Research and training/ supervision	Assess health care providers' behaviors in behavior change counseling (an adaptation of MI for brief health care consultations)	11
Client Language EAsy Rating (CLEAR)	Glynn & Moyers (2012)	Research and training/ supervision	Assess the in-session client language as change talk or sustain talk	2
Motivational Interviewing Assessment Scale (MIAS)	Campiñez Navarro et al. (2016)	Research	Assess health care providers' MI skills in brief health care consultations	14
Motivational Interviewing Assessment: Supervisory Tools for Enhancing Proficiency (MIA:STEP)	Martino et al. (2006)	Training/ supervision	A tool for clinical supervisors to enhance practitioners' existing MI skills (includes a rating schema that assess practitioners' MI skills)	16

Continued

Table A45.2.1 Cont.

Instrument	Reference	Primary Purpose	Brief Description	No. of Assessed Variables
Global Rating of Motivational Interviewing Therapist (GROMIT)	Moyers (2004)	Research	Assess practitioners' global MI skills in individual MI counseling	15
Motivational Interviewing Competency Assessment (MICA)	Jackson et al. (2015)	Training/ supervision	Assess practitioners' MI skills in individual MI counseling	9
Motivational Interviewing Scenarios Tool for Eating Disorders (MIST-ED)	Sepulveda et al. (2013)	Research	Assess beginner MI skills of caregivers of adolescents with eating disorders	9
Motivational Interviewing Skill Code (MISC)	Miller et al. (2008)	Research	Assess practitioners' MI skills and in-session client language in individual MI counseling	27[a]
Motivational Interviewing Supervision and Training Scale (MISTS)	Madson, Campbell, Barrett, Brondino & Melchert (2005)	Training/ supervision	Assess practitioners' MI skills in individual MI counseling	20
Motivational Interviewing Target Scheme (MITS 2.1)	Allison, Bes, & Rose (2012)	Research and training/ supervision	Assess global core components of MI in individual MI counseling	7
Motivational Interviewing Treatment Integrity (MITI)	Moyers, Manuel, & Ernst (2015)	Research and training/ supervision	Assess practitioners' MI skills in individual MI counseling	14
Motivational Interviewing with Significant Others (MISO)	Apodaca et al. (2007)	Research	Assess language of significant others in MI sessions	13
Sequential Code for Observing Process Exchanges (SCOPE)	Martin et al. (2005)	Research	Sequentially assess practitioners' MI skills and client responses in individual MI counseling	27[b]
Video Assessment of Simulated Encounters – Revised (VASE-R)	Rosengren et al. (2005)	Training/ supervision	Assess practitioners' MI skills via simulated encounters	18
Yale Adherence and Competency Scale (YACS)	Nuro et al. (2005)	Research	Assess practitioners' adherence and competence in behavioral treatments for alcohol and substance abuse problems, such as CBT and MI	9[c]

Note. [a]Subcategories not included; [b]Subcategories not included; [c]Only the MI-specific items.

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Appendix 45.3 Example Conversations from Motivational Interviewing Counseling Sessions

Targeting Problem Gambling by Telephone (SCOPE Coding)

The session is coded according to the Sequential Code for Observing Process Exchanges (SCOPE; Martin et al., 2005).

CLIENT: I'm in a crisis now … I'm totally broke. I spent my entire salary on online slots yesterday. *[Reason +]*

COUNSELLOR: Life hasn't turned out the way you planned. *[Complex reflection +]*

CLIENT: No. Really not. *[Reason +]* At the same time, I can't stop. *[Ability −]* I just can't. *[Ability -]* Sometimes I think I am addicted to the losing not the winning … *[Other −]*

COUNSELLOR: To stop gambling altogether does not feel like an alternative right now, but at the same time you feel that something must change since you're not happy with your situation as it is today. *[Complex reflection −/+]*

CLIENT: No … I am so worried right now. I have no clue how to get through this month. *[Follow/Neutral]* Before I never touched the money for my bills but last night, I messed up and I can't borrow from friends anymore, as I still owe them. *[Taking steps −]* The only way is to win it all back so I can repay my debts so I don't have to tell my girlfriend. *[Reason −]*

COUNSELLOR: So yesterday you did something you've never done before and gambled away your entire salary …

CLIENT: Hmm *[Not coded]*

COUNSELLOR: … and you don't want your girlfriend to know this. *[Simple reflection]*

CLIENT: No … *[Follow/Neutral]*

COUNSELLOR: The relationship with your girlfriend is very important to you. *[Complex reflection]*

CLIENT: Yes … she doesn't know anything about this. I always make up stories to cover up the truth. I'm terrified of losing her. *[Follow/Neutral]*

COUNSELLOR: *You're tired of lying* so often to your girlfriend. She is very important to you and you really want your relationship to work. *[Complex reflection]*

CLIENT: I'm so sick of this life. *What* began as fun evenings *of gambling have turned into something else. I*t's not fun at all anymore. *[Reason +]*

COUNSELLOR: You're tired of living like this and you don't want to gamble anymore. Your gambling behavior has turned you into the kind of person you don't want to be. *[Complex reflection +]*

CLIENT: I have promised myself so many times to stop *[Commitment +]* ... but I can't keep away. *[Ability −]* I tell myself I will win it all back. *[Reason −]*

COUNSELLOR: You have begun to see a clear pattern, but then you feel you need to win back what you lost. *[Complex reflection −]*

CLIENT: Yes, and even if I win, I put the money back in to win more. But then I usually lose it … *[Follow/Neutral]*

COUNSELLOR: You are very self-aware! You know that you have to accept the losses and stop thinking you will win them back. *[Affirm]*

CLIENT: I guess so. *[Other +]* I just don't know how to stop. *[Ability −]*

COUNSELLOR: When you promised yourself to stop in the past, how were you thinking of

stopping? *[Open Question-, eliciting change talk]*

CLIENT: *I thought about what I could do instead of* gambling when I have free time or feel bored. Like going to the gym. *[Commitment +]*

COUNSELLOR: That's great! You have already thought about an activity you can do instead of gambling! *[Simple reflection +]* Anything else? *[Closed question-, eliciting change talk]*

CLIENT: No, not really. *[Follow/Neutral]*

COUNSELLOR: Would you like me to give you some information about other ways to prepare yourself to stop gambling? Ways that have been helpful for others? *[Permission seeking]*

CLIENT: Sure. I will do whatever it takes. *[Commitment +]*

COUNSELLOR: You have made a decision. You will do whatever it takes to stop gambling. *[Complex reflection +]*

CLIENT: Yes. *[Commitment +]* No *excuses anymore. [Reason +]*

COUNSELLOR: Ok, that's great. Enough is enough. By making that decision, you have already come a long way! *[Emphasize Control]*

CLIENT: But I need help. *[Ability −]*

COUNSELLOR: Of course. And as I said I have some information that may be helpful for you. *[Structure]*

CLIENT: Shoot. *[Follow/Neutral]*

COUNSELLOR: It is usually very helpful to eliminate the possibilities of gambling in your life. You have already thought about one way of doing that by adding other joyful activities in your life so you don't have the time to gamble. Another way is to eliminate money supply, like letting someone else be in charge of your money, or blocking gambling sites on your computer. Let's stop here. *[General Info]* What do you think about these alternatives? *[Open question, eliciting neutral talk]*

CLIENT: To ask someone to be in charge of my money is out of the question. I don't want anyone to find out about this. *[Follow/Neutral]* But I will definitely block all gambling sites on my computer and phone […]. *[Commitment +]*

Targeting Return-to-Work Activities after Long-Term Sick Leave (MITI 4.2.1 Coding)

The session is coded according to the Motivational Interviewing Treatment Integrity Code 4.2.1. (MITI; Moyers, Manuel, & Ernst, 2015).

UNEMPLOYEE: I'm supposed to start some kind of employment training … to eventually be able to work again. But I don't think I'm ready. I haven't worked for a very long time … let's see … 2 years now. I don't understand what workplace I'm supposed to do this kind of "training" at.

EMPLOYMENT OFFICER: So you're thinking a lot about what it actually means to participate in an employment training program. *[Complex reflection]*

UNEMPLOYEE: Yes. I'm not sure if I'm ready and at the same time I feel enormous pressure from … hmm … everybody … that I have to do it.

EMPLOYMENT OFFICER: You're not sure what it would require of you to take part in this kind of program. *[Complex reflection]*

UNEMPLOYEE: Yes, I'm still not well … but I also know, so you don't have to tell me, that I probably would be better off if I engaged in some kind of activity and got out of the house a little bit more.

EMPLOYMENT OFFICER: So getting out a little bit more is something you think could positively influence your state of wellbeing. *[Simple reflection]*

UNEMPLOYEE: Yes … And I get it. I do feel quite alone. I live by myself and don't meet a lot of people. But at the same time … there's a reason for that. I haven't been feeling well. I had no choice.

EMPLOYMENT OFFICER: So if you found a way of getting out of the house more, in a way that would work for you, and had more social contacts on a regular basis that way, this is something you think would have a positive impact on your wellbeing. *[Simple reflection]*

UNEMPLOYEE: I guess so.

EMPLOYMENT OFFICER: You're a sociable person. *[Complex reflection]*

UNEMPLOYEE: I am. Socializing is what I miss from not working. That someone asks me how I feel … asks me how my weekend has been.

EMPLOYMENT OFFICER: A sense of belonging. *[Complex reflection]*

UNEMPLOYEE: Yes, I miss that. And another thing … As it is, today I have nothing to tell if someone actually asks me how I am, what I've been doing … I have nothing to say since every day is the same.

EMPLOYMENT OFFICER: So if you get out of the house more and meet more people, for example by engaging in some kind of job-training activity, this would change. *[Complex reflection]*

UNEMPLOYEE: I guess so. It would definitely enrich my social life …

EMPLOYMENT OFFICER: What other benefits could you imagine if you did some job-training activities? *[Question]*

UNEMPLOYEE: I have a lot of body aches and the doctor says it's because of my sedentary lifestyle … and well, it sounds reasonable.

EMPLOYMENT OFFICER: You are thinking that job-training by default would result in more daily exercise which in turn might relieve the pain … *[Complex reflection]*

UNEMPLOYEE: Probably. And I feel more and more isolated. It took a lot of effort just to get to this meeting.

EMPLOYMENT OFFICER: I understand that and I really appreciate you coming here to see me today! *[Affirm]*

UNEMPLOYEE: Hmm …

EMPLOYMENT OFFICER: So the advantages of job-training for you would be to get more daily exercise and more social contacts in your everyday life. *[Simple reflection]*

UNEMPLOYEE: Yes. Absolutely … People often ask "what do you for a living?" and it's not fun to say that you are unemployed … it's like "what's wrong with you."

EMPLOYMENT OFFICER: This is an uncomfortable situation for you. *[Complex reflection]*

UNEMPLOYEE: I always try to turn it around and describe all the positive effects of being unemployed … and that's so weird. I have been sick! I haven't been able to work.

EMPLOYMENT OFFICER: It doesn't feel good that you have to come up with excuses … *[Complex reflection]*

UNEMPLOYEE: No. So I guess that would be another benefit of getting back to work …

EMPLOYMENT OFFICER: So …

UNEMPLOYEE: But the question is if I'm ready … I don't have the same energy anymore … I get easily stressed. If I start working again, I want to perform well.

EMPLOYMENT OFFICER: You are a responsible person who wants to contribute to the company you're at! *[Affirm]*

UNEMPLOYEE: Yes. I don't like free riders.

EMPLOYMENT OFFICER: Have you received any information about the purpose of a job-training program and what it would require from you? *[Question]*

UNEMPLOYEE: No, not really. I got a brochure when I was here last time but I haven't really had time to read it.

EMPLOYMENT OFFICER: Would you like me to tell you a little bit about that? *[Seeking Collaboration]*

UNEMPLOYEE: Sure.

EMPLOYMENT OFFICER: The idea of the job-training program is that it should be "a road back to work." People should be able to begin working again, under supervision, with personally adapted working hours, and without needing to be productive. […] *[Giving Information]*

Targeting School Dropout Prevention (CLEAR Coding)

The session is coded according to Student Language EAsy Rating (CLEAR; Glynn & Moyers, 2012). Only client change talk (CT) and counter-change talk (CCT) are coded.

TEACHER: Hi Sara!
STUDENT: Hi!
TEACHER: I missed you at class this morning!
STUDENT: Oh, yeah … Sorry about that.
TEACHER: Do you have a minute?
STUDENT: Hmm. Okay, sure … but just so you know. I'm not gonna skip any more classes so there's really nothing to talk about. *[CT]*
TEACHER: That's great Sara! But if you have a minute or two I would just like to ask you if everything is okay with you?
STUDENT: Well … yeah. Everything's okay.
TEACHER: So nothing special has happened.
STUDENT: No … not really. I know that I have missed several classes in the last few weeks but it's just that I have been very tired lately *[CCT]*. I haven't had the energy to come here. *[CCT]*
TEACHER: So it is not that you do not want to come, it is just that you do not have the energy to attend classes because you're so tired.
STUDENT: Well, yeah. Pretty much so. I'm guessing it's because I stay up to late in the evenings … it's so easy to watch just one more YouTube video instead of going to bed. *[CCT]* And then I of course have difficulty waking up in the morning …
TEACHER: You find yourself in a downward spiral where you don't have the energy to go to school because you stay up too late in the evenings.
STUDENT: Yeah. But actually I'm kind of tired of it all too. *[CCT]* I'm not really sure what I'm doing here anymore. *[CCT]*
TEACHER: So lately you have started to think a lot about what all this could be good for, how it will benefit you in the long run.
STUDENT: Hmm, yeah. It's not like I'm a straight A student. It feels like I have a greater chance of success if I just drop out of school and got a job. *[CCT]*
TEACHER: It is important for you to succeed, in some way, and now you have started to ask yourself questions like "can I drop out of high school and still be successful?."
STUDENT: Yeah …
TEACHER: But in the beginning of the school term you were very motivated and was looking forward to the graduation day to "show them all," as you put it.
STUDENT: Hmm. That's true. I don't know what happened.
TEACHER: To help me understand how important it is to you today to finish high school, on a scale from 0 to 10, where 0 being not at all important and 10 being very important, how important is it to you?
STUDENT: Oh, well … I would say somewhere in the middle
TEACHER: If you would say a number …
STUDENT: Say 5 … 6. Well maybe 6 then.
TEACHER: You choose 6. Right above the middle.
STUDENT: Hmmm …
TEACHER: Why are you choosing 6 instead of for example 3 or 4?
STUDENT: My parents have told me ALL the reasons there is to finish … millions of times … *[CT]*
TEACHER: You have been talking about this with your parents and they have made quite an effort trying to make you see all the benefits of not dropping out.
STUDENT: Oooh yes!
TEACHER: But what pros can you see of not dropping out of school?
STUDENT: Well … It would be nice to have a diploma to show *[CT]* ... In that case I would

be the first in my family to finish high school, as you know. *[CT]*

TEACHER: So your parents would be so proud of you, and you would be very proud of yourself too!

STUDENT: They would be crazy proud. *[CT]*

TEACHER: You light up talking about it.

STUDENT: It would mean a great deal. *[CT]*

TEACHER: I understand that.

STUDENT: Hmmm …

TEACHER: Out of curiosity, if it's okay with you and you still have time?

STUDENT: Sure.

TEACHER: Ok. Something made you choose several of my classes, social sciences subjects. Why was that?

STUDENT: Well … before I was thinking about studying social science at college … like social work or psychology or something. I have always been interested in other people and why they do as they do. I always watch Big Brother and other reality shows like that and I think it's very interesting to see how they interact […]

References

Glynn, L. H., & Moyers, T. B. (2012). *Manual for the Client Language EAsy Rating (CLEAR) Coding System.* Unpublished manual, University of New Mexico, Center on Alcoholism, Substance Abuse and Addictions (CASAA). https://casaa.unm.edu/download/CLEAR.pdf

Martin, T., Moyers, T. B., Houck, J., Christopher, P., & Miller, W. R. (2005). *Motivational Interviewing Sequential Code for Observing Process Exchanges (MI-SCOPE) Coder's Manual*. Albuquerque, NM: University of New Mexico, Center on Alcoholism, Substance Abuse and Addictions (CASAA). http://casaa.unm.edu/download/scope.pdf

Moyers, T.B., Manuel, J. K., & Ernst, D. (2015). *Motivational interviewing treatment integrity coding manual 4.2.1*. Unpublished manual. http://casaa.unm.edu/download/MITI4_2.pdf

Appendix 45.4 Change Talk and Sustain Talk

Research into how motivational interviewing (MI) works has underlined the importance of evoking and strengthening client change talk and avoiding unintentional reinforcement of client sustain talk (Magill et al., 2018). One way to recognize client change or sustain talk is to pay attention to *client language categories* that typically signal movement towards change, such as desire, ability, reason, need, commitment, activation, and taking steps (DARN-CATS; Miller & Rollnick, 2013). For example, the client utterance, "I want to quit gambling," would be categorized as a desire utterance indicating change talk. Examples of client utterances reflecting change talk and/or sustain talk are illustrated in the sample conversation below. To better understand practitioner-client interaction, note which MI-techniques the practitioner uses to evoke change talk and suppress sustain talk (see Table A45.1.1).

References

Magill, M., Apodaca, T. R., Borsari, B. et al. (2018). A meta-analysis of motivational interviewing process: Technical, relational, and conditional process models of change. *Journal of Consulting and Clinical Psychology*, *86*, 140–157. https://doi.org/10.1037/ccp0000250.

Miller, W. R., & Rollnick, S. (2013). *Motivational Interviewing: Helping People Change* (3rd ed.). New York: Guilford Press.

Example of Practitioner-Client Interaction with Highlighted Change and Sustain Talk Promoting Physical Activity

CLIENT: It is difficult for me to find time for regular exercise. I have two young children at home and it's not that easy to make plans for training. Especially when you work and you already have so little time with the children. And my husband works shifts so it is a puzzle to make everyday life work already as it. *[Sustain talk]*

PRACTITIONER: You have been thinking about this a lot. You can clearly imagine what situations you have to find solutions for in order to implement this.

CLIENT: Yes, and this is nothing I would do just because it's fun. I am not a sporty person who voluntarily gets up at 5 am to go for a run before the rest of the family wakes up. *[Sustain talk]*

PRACTITIONER: You know yourself best and know what realistic training goals could be for you.

CLIENT: Yes, yes, absolutely. I've been thinking about doing some kind of exercise for years *[Change talk]*, but it never happens. I don't have time and I don't think it's fun. *[Sustain talk]*

PRACTITIONER: You prioritize your children and your work and training is nothing you really lack in your life, but you also say that you have been thinking about getting started with some type of exercise for years.

CLIENT: Yes … *[Unclear; confirms a double-sided reflection]*

PRACTITIONER: So how come you have been thinking about this for years? What would be the benefits of getting started with some type of physical activity for you?

CLIENT: I have problems with back pains and I guess that could get much better if I were just little bit more physically active in

everyday life. And I know that my body would be pleased if I lost a bit of weight too. Sometimes, I feel limited by my weight. *[Change talk]*

PRACTITIONER: So just a little more physical activity in your life would help with your back pain and could also be favourable by helping you to lose some weight […].

CLIENT: Yes, for sure. *[Change talk]*

Appendix 45.5 Motivational Interviewing Training

A Five-Hour Free Introductory Course in Motivational Interviewing (MI) within the KIBEHMEDx MOOC

This introductory course on motivational interviewing (MI) is the first section of a massive online open course (MOOC) entitled "Behavioral Medicine: A Key to Better Health (KIBEHMEDx)," available without cost on the edx.org platform and authored by Anne H. Berman as part of Karolinska Institute's MOOC initiative. To register for the course, sign up on the edx.org site and search for KIBEHMEDx. Make sure the course is the version offered in collaboration with EIT-Health. It is an "archived" course, meaning all material is available but no discussion forum is regularly available, except for occasions when the course is run as "self-paced." The syllabus of the course includes the following:

1. Health behaviors and motivation to change
    a. Introduction
    b. Video: Introduction to health behaviors and motivation to change
    c. References
2. What is Motivational Interviewing (MI)?
    a. Video: Introduction to MI; Activity: Questions on key features of MI
    b. Reading: Habits and behavior change
3. Basic tools of MI
    a. Video: Basic tools (OARS); Activity: Independent exploration about MI
    b. Video: Open Questions; Activity: Thinking about open questions, Activity: What conversational opening style suits you?
    c. Video: Affirmations; Activity: Identifying affirmations
    d. Video: Reflective listening; Activity; Distinguishing between simple and complex reflections
    e. Video: Summarizing; Activity: Summarizing
    f. Video: Virtual patient preview; Activity: Summarize
4. Processes of MI
    a. Video: Engaging and focusing to prepare for change; Activity: Reading; Activity: Quiz
    b. Video: Evoking and planning change; Activity: Quiz; Activity; What's most important for good MI?
    c. Video: The guy in the bar; Activity: Coding counselor and client talk; Activity: Discussion; Activity: Identifying MI processes

Syllabi for MI Training

The *Motivational Interviewing Training New Trainers Manual* (TNT), from the Motivational Interviewing Network of Trainers (MINT, 2018), organizes MI training methods by the structure of MI conversations, from opening strategies to the four processes of MI (engagement, focusing, evoking, and planning) and provides a variety of training ideas, specific exercises, metaphors, and activities designed to help practitioners learn MI as well as teach it. The TNT manual begins by stating that different training methods are called for in different learning situations and provides guidelines for what reasonably can be accomplished accordingly. For example, training exercises are sorted by goals, ranging from "*To experience the basics of MI and decide level of interest in learning more*" to "*To learn a flexible*

range of skills and methods for helping others learn MI." Training varies in length by focus – for example, *MI Introduction Training, MI Application Training, Clinical Training, Advanced Clinical Training, Supervisory Training and Training for Trainers*. Regardless of length, most MI trainings usually contain an overview of the history and theory of MI, together with an introduction to core MI concepts and techniques. Some trainings also include current MI research and an overview of methods for ensuring MI fidelity.

Training activities may include:

- Lectures/didactic instructions
- Group discussions
- Individual reflections
- Written exercises and reflections
- Demonstrations of skills
- Video demonstrations
- Experiential exercises including skill practice (e.g., role plays)

Training content may include:

- The definition of MI
- The spirit of MI
- The four processes of MI (i.e., engaging, focusing, evoking, and planning)
- Reflective listening skills – OARS (i.e., open questions, affirmations, reflections, and summaries)
- Recognizing change talk and sustain talk
- Evoking and responding to change talk
- Responding to sustain talk

References

MINT (Motivational Interviewing Network of Trainers). (2018). *Motivational Interviewing Training New Trainers Manual*. www.motivationalinterviewing.org/sites/default/files/tnt_manual_2014_d10_20150205.pdf.

Appendix 46.1 Examples of Scholarly Peer-Reviewed Journals That Publish Research on Behavior Change

Journal[a]	Publisher
Health Psychology	
Applied Psychology: Health and Well-Being	Wiley
British Journal of Health Psychology	Wiley
Health Psychology	American Psychological Association
Health Psychology and Behavioral Medicine	Taylor & Francis
Health Psychology Review	Taylor & Francis
International Journal of Clinical and Health Psychology	Elsevier
Journal of Health Psychology	SAGE
Journal of Occupational Health Psychology	American Psychological Association
Psychology and Health	Taylor & Francis
Social Science and Medicine	Elsevier
Behavioral Medicine	
Annals of Behavioral Medicine	Oxford Academic
International Journal of Behavioral Medicine	Springer
Journal of Behavioral Medicine	Springer
Translational Behavioral Medicine	Oxford Academic
General Behavioral Science	
Motivation and Emotion	Springer
Motivation Science	American Psychological Association
Nature Human Behavior	Nature
Social Psychology	
Journal of Experimental Social Psychology	Elsevier
Journal of Personality and Social Psychology	American Psychological Society
Personality and Social Psychology Bulletin	SAGE
Personality and Social Psychology Review	SAGE
Social Psychological and Personality Science	SAGE
Social Psychology	Hogrefe

Note. The list of journals is intended to be illustrative of possible scholarly outlets publishing research on behavior change and should not be considered exhaustive.