Chapter 14

Health Behavior, Health Promotion, and the Transition to Parenthood: Insights from Research in Health Psychology and Behavior Change

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Full citation: Hagger, M. S., & Hamilton, K. (2019). Health behavior, health promotion, and the transition to parenthood: Insights from research in health psychology and behavior change. In O. Taubman-Ben-Ari (Ed.), *Pathways and barriers to parenthood: Existential concerns regarding fertility, pregnancy, and early parenthood* (pp. 251-269). Cham, Switzerland: Springer. doi: 10.1007/978-3-030-24864-2_15

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Martin Hagger's contribution was supported by a Finnish Distinguished Professor Programme (FiDiPro) award from Business Finland.

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Abstract

The transition to parenthood represents a period of considerable change. Much of the change is positive as parents experience the inherent emotional and social benefits of becoming a parent. However, it is also a period of considerable challenge and stress, which can have deleterious effects on health and well-being. Increased demands of caring for an infant can lead to loss of sleep, limited 'leisure' time, restrictions on social life, and difficulties in managing 'work-life' balance. In addition, the disruption and time demand lead to parents 'falling out' of health habits. Parents also have new responsibilities to care for the health of their child, and socialize them into healthy habits. Identifying strategies parents can adopt to initiate and maintain health behaviors during the transition to parenthood may be important means to increase their physical and psychological health. In addition, providing parents with the motivation and means to socialize their children into health behaviors is an important health promotion goal. The present chapter reviews the key behavioral health issues experienced by adults in the transition to parenthood, focusing on behaviors that will promote good physical and psychological health, and the imperative of adopting behaviors that will promote and maintain the health of their child. Research on the application of social cognitive theories to predict and understand health behavior in parents and their children will be reviewed. Based on this research, theory-based behavior change strategies aimed at promoting health behaviors in parents in the transition to parenthood and their children will be identified.

Introduction

The transition to parenthood represents a period of considerable change and stress, and may have adverse effects on psychological health as well as physical health (Bleidorn et al., 2016; Doss & Rhoades, 2017; Marshall, Simpson, & Rholes, 2015). Loss of sleep, increased workload, limited 'leisure' or 'down' time, restrictions on socializing with partner, and management of the balance between family, work, and social commitments may all have substantive impact on health outcomes for parents (Barimani, Vikström, Rosander, Forslund Frykedal, & Berlin, 2017). Although these demands may be mitigated later on, the initial disruptions that occur during early parenthood may lead to parents 'falling out' of health habits (Da Costa et al., 2017). In addition, parents have increased responsibilities to care for the health of their children (e.g., making sure their children eat health-promoting food, engage in physical activity, are protected from the sun) and, when their children are older, 'socialize' them into taking up healthy habits (Hamilton, Daniels, White, Murray, & Walsh, 2011; Hamilton & White, 2011, 2012).

Strategies that enable parents to initiate and maintain health behaviors during the transition to parenthood may be important means to increase the physical and psychological health of parents (Hamilton, Cox, & White, 2012; Hamilton et al., 2011). Research into the self-regulation of health behavior (i.e., getting people to be better able to change behavior for themselves), can provide useful insight into techniques and strategies that can be used to promote better engagement in health behavior during the transition to parenthood and life as a parent in general. Researchers in the field of health psychology have applied theories of social cognition to identify the important factors that determine parents' participation in health behaviors (e.g., Hamilton, Cleary, White, & Hawkes, 2016; Hamilton, Hatzis, Kavanagh, & White, 2015; Hamilton, Kirkpatrick, Rebar, White, & Hagger, 2017). These factors include beliefs, attitudes, self-efficacy,

perceived barriers, normative beliefs, and personality factors that relate to health behaviors and their lifestyle (McMillan & Conner, 2007). Based on these factors, specific techniques that may be useful in promoting self-regulation of health behavior in parents have been identified including goal setting, planning, skill building, and cue-monitoring (Hamilton & White, 2014). The effectiveness of these techniques has been shown in producing greater participation in health behaviors (e.g., physical activity, healthy eating, reduced alcohol consumption) and health outcomes including reduced stress and increased life satisfaction, psychological well-being, and quality of life (Kwasnicka, Dombrowski, White, & Sniehotta, 2016). The techniques can be utilized by practitioners interested in parent and child health in simple, low burden interventions and health messages that can promote better health behaviors in new parents. In this chapter, we (a) identify the key health issues facing adults transitioning to parenthood particularly with respect to their own health behaviors, and the need to engage in new health related behavior to maintain and promote the good health of their child; (b) review the social cognitive theories that have been applied to predict and understand health behavior in parents; and (c) identify theory-based behavior change strategies and interventions aimed at promoting behaviors that will lead to salient health outcomes of this population and their children.

Thinking Behaviorally: Promoting Health in the Transition to Parenthood

The arrival of a new born child presents considerable challenges to parents, whether that be parents transitioning into parenthood with the arrival of their first-born child or parents continuing the transition process with the arrival of additional children. During this life-stage, priorities and attention often shift from work, social, and other everyday commitments and activities to the role of caregiver, and parents are confronted with the need to find sufficient time and resources in what may be an already full agenda to care for their new child as well as care for other family members they may be responsible for

(Rolle et al., 2017). This overwhelming sense of an 'ethic of care', which is especially felt by mothers (Hamilton & White, 2010c), makes it difficult, then, for parents to prioritize their own health needs over the needs of their parenting responsibilities. Taken together, the many challenges parents face during the years of establishing a young family and the shift in focus to the priority of the child and others may influence parents' interest and ability to be involved in personal health behaviors, and health behaviors previously engaged in prior to parenthood may become of lower priority and/or sacrificed to accommodate the new demands on their time (Hamilton & White, 2010c; Perales, del Pozo-Cruz, & del Pozo-Cruz, 2015). Such behavioral shifts may have also occurred prior to the birth of the child. For example, mothers will likely find that the physiological changes and demands of pregnancy make engaging in health behaviors more challenging and, as a result, may opt out of certain behaviors, often with the motive of reengaging with them postpartum (Merkx, Ausems, Bude, de Vries, & Nieuwenhuijze, 2017).

An important consideration that likely affects decisions to engage in behaviors is resource availability. Parenthood, especially in the early period of adjustment, is particularly demanding, and loss of sleep along with the demands of the new caregiving role and the need to adjust most components of the daily routine to care for the child may take a toll on energy and lead to increased perceptions of fatigue (Hamilton & White, 2010a, 2011). Parents may not feel like engaging in health behaviors that require considerable effort (e.g., exercise) and, thus, may opt to engage in habitual, easy-to-enact behaviors (e.g., television viewing) in order to free up time for rest or socializing. Furthermore, parents may want to take the time to share time with their partner or enjoy free time with their child, and may feel that their energy should be focused on these at the expense of health behaviors.

A number of behaviors important to promoting and maintaining good physical and mental health, and minimizing risk of chronic illness (e.g., regular physical activity), may decline in the transition to parenthood (Bellows-Riecken & Rhodes, 2008). Epidemiological research demonstrates that four key health behaviors, participating in regular physical activity, eating healthily, refraining from smoking, and keeping alcohol consumption within guideline levels is associated with an 11-14 year reduction in all-cause mortality (Ford, Zhao, Tsai, & Li, 2011). These behaviors should, therefore, be viewed as priorities for all adults including new parents. However, parenthood may present challenges to regular engagement in these behaviors. For example, time available for physical activity may be perceived as limited (Hamilton & White, 2011), and parents' attention to the dietary needs of the child may shift their focus from their own eating habits (Bassett-Gunter et al., 2013). In contrast, parenthood may present new opportunities to engage in health behaviors (Hamilton & White, 2010c). For example, pregnancy and the arrival of a new child may serve as a 'flashbulb' impetus for mothers and fathers, respectively, to quit smoking (Moan, Rise, & Andersen, 2005). Parents may find that catering for the new child also results in greater scrutiny of their own diet (Merkx et al., 2017), and presents a new reason to start exercising by taking their newborn for walks in a perambulator (Thompson, Vamos, & Daley, 2017).

In addition to challenges faced with engaging in behaviors to promote with own health, new parents also need to consider the adoption of behaviors that will ensure the good health of their child. These behaviors go beyond everyday caregiving behaviors aimed at maintaining current health, such as feeding, sleep, shelter, and general hygiene, but encompass behaviors that will ensure long term health and prevent illness in the future. These include single behaviors like immunization from communicable diseases such as tuberculosis, measles, mumps, and rubella (Bishop, Holden, Ogollah, Foster, & Team,

2016), extending breast feeding which has been linked to reduced obesity and metabolic syndrome in children (Ekelund et al., 2009), regular attendance to health clinics for checkups (Sawyer et al., 2016), protection from the sun (Hamilton, Kirkpatrick, Rebar, White, et al., 2017), introducing solid foods into the child's diet (Hamilton et al., 2011), eating fruit and vegetables and limiting discretionary choices (Spinks & Hamilton, 2016), limiting screen-time (Hamilton, Spinks, White, Kavanagh, & Walsh, 2016), improving physical activity (Hamilton & Schwarzer, 2017; Hamilton, Thomson, & White, 2013; Rhodes et al., 2016), and improving oral health (Van den Branden, Van den Broucke, Leroy, Declerck, & Hoppenbrouwers, 2013). In some cases, the behaviors will be prompted by usual care offered to parents after the birth of a child, as in the case of vaccination, while others require considerable deliberation and planning. Transitioning to parenthood, therefore, requires parents to identify these key behaviors and engage in sufficient planning to enact them.

Social Cognitive Theories and Health Behavior

Given the importance of parents' regular engagement in health-promoting behaviors, and their avoidance of health-compromising behaviors, to optimal personal health and the health of their child, initiatives, such as interventions, campaigns, and clinic-based advice from health professionals, aimed at to promoting health behaviors should be considered (Tully et al., 2017). Such initiatives need to be grounded in factors known to be related to the target health behavior, particularly factors are derived from social cognitive theory (Biddle, Hagger, Chatzisarantis, & Lippke, 2007). Identifying social cognitive correlates of parent health behaviors in the transition to parenthood may assist in the identification of the potentially manipulable factors that may form the targets for initiatives seeking to change behavior to promote better parent and child health (Hamilton et al., 2012; Hamilton & White, 2012). Application of theories of social cognition have been a

prominent means adopted by health behavior researchers to identify antecedent factors that relate to health behavior and the processes involved.

Social cognitive theories are considered to have utility in health behavior prediction as they outline the factors relating to individuals decision-making in social contexts based on beliefs derived from previous experience and an evaluation of the outcomes and consequences of future social action (Biddle et al., 2007). Central to theories of social cognition is the assumption that individuals' behavior is eminently predictable provided the researcher has knowledge of all sets of social information, and co-occurring processes, on which individuals base their decisions. In addition, social cognitive theories assume that individuals are rational decision-makers and their decisions to act are determined by their processing of the available information on the course of action and its future outcomes (Bandura, 1986). When applying social cognitive theories to health behavior, therefore, the focus is on how individuals' beliefs about future participation in a health behavior of interest relates to their actual participation in the behavior.

A prominent approach adopted to predict and understand health behaviors across multiple contexts is the reasoned action approach, a social cognitive theory that arose from attitude-based theories and focus on the impact of belief-based judgements on future behavior (Fishbein & Ajzen, 2010). The prototypical form of the reasoned action approach is the theory of planned behavior (Ajzen, 1991). Central to the theory is the construct of intentions, a motivational construct which reflects an individual's judgement on how much they will plan and invest effort in pursuing a future behavior. For example, the stronger new parents' intention to participate in physical activity, the greater the likelihood that they will perform that behavior in future. The theory proposes that intentions are a function of three sets of belief-based constructs, attitudes, subjective norms, and perceived behavioral control. Attitudes reflect an individual's positive or

negative judgement of the behavior, subjective norms reflects perceptions that the behavior is something salient others (e.g., partner/spouse, family, friends) want them to do, and perceived behavioral control reflects perceptions that the individual has the capacity to perform the behavior and to overcome barriers that may impede doing the behavior. In terms of process, intentions are proposed to *mediate* the effect of attitudes, subjective norms, and perceived behavioral control on behavior. This means that individuals with positive attitudes, subjective norms, and perceptions of control are more likely to align their future intentions with those beliefs and are, therefore, more likely to engage in the behavior in future.

Attitudes, subjective norms, and perceived behavioral control are belief-based constructs (Ajzen, 1991). According to the theory of planned behavior, these constructs serve as summary accounts of the sets of beliefs an individual holds about performing the behavior in future. One set of beliefs, summarized by the attitude construct, reflect the individual's beliefs about whether the behavior will result in certain outcomes (known as *behavioral beliefs*) and whether those outcomes are desirable or important to the individual (known as *outcome expectancies*). These beliefs, therefore, reflect whether an individual beliefs toward the behavior will lead to outcomes and how much that outcome is important to them. For example, a new parent might think that eating less added sugar might lead to less fluctuations in energy levels, an outcome they deem to be important. The identification of an expected outcome and a judgment of its importance is known as an expectancy-value model of attitudes. Similarly, an expectancy-value model of subjective norms comprises beliefs about salient referents (e.g., partner, friends; *normative beliefs*) and the extent to which one is likely to act in accordance with their views (*motivation to comply*). The same model applied to perceived behavioral control identifies beliefs about extent of control over the behavior (e.g., lack of time; *control*

beliefs) and the strength or importance of that control (*perceived power*) to the individual. Together these sets of beliefs are proposed as direct measures of the attitude, subjective norms, and perceived behavioral control constructs and are said to be antecedent to these constructs. Behavioral, normative, and control beliefs toward a particular behavior are usually identified through open-ended belief elicitation from a sample of people from the target population. The beliefs provide potential target for intervention in persuasive communications aimed at changing health behavior.

The theory of planned behavior has been shown to be an important means to understand some key health behaviors in the transition to parenthood. The theory has been applied to predict and understand health behaviors during pregnancy such as physical activity (Hamilton, Fleig, Henderson, & Hagger, 2017; Rhodes et al., 2014b), smoking cessation (De Wilde et al., 2017), and healthy eating (Malek, Umberger, Makrides, & Zhou, 2017). For example, Rhodes et al. (2014b) examined the predictors of physical activity participation using the theory of planned behavior in mothers and fathers who were either expecting their first child, and those expecting their second child. They found that perceived behavioral control was much more important among mothers expecting their first child in particular. De Vivo, Hulbert, Mills, and Uphill (2016) meta-analysis of research studies applying the theory of planned behavior to predict physical activity participation during pregnancy supported theory hypotheses, but also noted a particularly strong effect for subjective norms on intentions, larger than the size of the effects for this construct usually found in studies in other populations. The authors speculated that this might indicate the importance of social support and normative information in forming intentions to physical activity during pregnancy, which is unsurprising given the likely additional needs associated with exercising when pregnant.

The theory has also been applied to parental behaviors to promote the health of their children including sun safety behavior (Hamilton, Kirkpatrick, Rebar, & Hagger, 2017; Hamilton, Kirkpatrick, Rebar, White, et al., 2017), breastfeeding (Lau et al., 2017), introducing to solids (Hamilton et al., 2011), eating fruit and vegetables and limiting discretionary choices (Spinks & Hamilton, 2016), limiting screen-time (Hamilton, Spinks, et al., 2016), improving physical activity (Hamilton & Schwarzer, 2017; Hamilton et al., 2013), improving oral health (Van den Branden et al., 2013). The research has generally lent support for the importance of all three components in predicting intentions, again with higher contributions of subjective norms relative to studies in other populations given the importance of social support and normative influences on child care. Research has also explored the role of specific beliefs in determining the key belief-based factors that relate to parental behaviors to promote child health (Hamilton, Cleary, et al., 2016; Hamilton et al., 2011; Hamilton et al., 2015; Hamilton, Kirkpatrick, Rebar, White, et al., 2017; Hamilton, Spinks, et al., 2016). In one example, Hamilton, Cleary et al. (2016) demonstrated the importance of behavioral beliefs (improve child mental well-being, decrease parental distress, promote healthy habits in child), normative beliefs (spouse/partner, friends), and control beliefs (inconvenience, lack of time) on parents' intentions and behavior to limit their young children's screen time viewing.

There has also been research on the theory-based predictors of the health behaviors of parents themselves using the theory of planned behavior (Cowie, White, & Hamilton, 2017; Hamilton et al., 2012; Hamilton & White, 2010b, 2012; Rhodes et al., 2014a). Unsurprisingly, a large proportion of the research has focused on predicting behaviors that have been shown to be correlated with chronic disease risk and associated conditions that predispose people to those risks (e.g., Hamilton & White, 2014; Moan et al., 2005; Rhodes et al., 2014a). A substantive body of research has focused on physical activity

participation and healthy eating in mothers and fathers of new born children (Hamilton et al., 2012; Hamilton & White, 2010a, 2014). For example, research applying the theory of planned behaviors has demonstrated that control beliefs are particularly important predictors of physical activity participation in young mothers, and the effects of those beliefs tend to be higher in this population compared to young adults without children (Rhodes et al., 2014a). This study identified also identified some key barriers such as domestic duties and inclement weather as salient perceived barriers. Overall, research examining the salient behavioral and control beliefs from theory of planned behavior has suggested that interfering with other commitments, inconvenience, lack of time, and tiredness and fatigue, as prominent reasons for not participating in physical activity (Hamilton & White, 2010a, 2011).

The theory of planned behavior is not without limitations (Sniehotta, Presseau, & Araújo-Soares, 2014). One limitation is that it does not encompass all possible influences on health behavior and it has been criticized for shortfalls in its predictive capacity. Researchers have therefore augmented the theory with the aim of increasing its capability in predicting behavior. Research adopting augmented versions of the theory of planned behavior to predict the health behaviors of parents has demonstrated the importance of family norms (i.e., beliefs that a particular behavior is ‘typical’ and ‘expected’ within the individual’s family) and moral norms (i.e., personal beliefs of moral obligation to perform or refuse to perform a certain behavior) and social support from key groups. For example, Hamilton and White (2012) demonstrated unique effects for family norms, friend support, and an ‘active parent’ identity on physical activity participation among both mothers and fathers in families with young children. These findings suggest that having an identity of being a physically active parent and general consideration of child care and, importantly, the extent of perceived support for child care, are important factors in decisions of parents

to participate in health behaviors. Unsurprisingly, moral norms feature prominently in parents' decisions to engage in health-related behaviors which may have direct impact on the health of their children such as smoking (Moan et al., 2005). This is a unique health behavior as it has consequences for both the parent and the child, and given the importance of moral norms, the transition to parenthood may constitute an acute opportunity to intervene to change such behaviors. Where parents may have lacked motivation or rationale for quitting smoking to promote their own behaviors prior to parenthood, becoming a parent may present a unique opportunity to encourage parents to quit smoking. Interventions that promote parent identity along with quit smoking messages may have greater chances of success.

Additional components have also shown to have particular importance when it comes to behaviors in which new parents can participate to promote child health including role construction, moral norms, and anticipated regret. Researchers have identified these constructs as important determinants of health behaviors in behavioral contexts where individuals feel they have high social responsibility or there is strong social pressure to conform according to conventional values or norms. This is likely to be the case for new parents engaging in health behaviors to maintain the good health of their child. For example, role construction has been shown to independently predict parents' intentions for a range of child health behaviors (Hamilton, Kirkpatrick, Rebar, White, et al., 2017; Hamilton, Spinks, et al., 2016; Spinks & Hamilton, 2016). Role construction regarding parental involvement for childhood behavior is thought to be influenced by beliefs about desired child outcomes, responsibility for these outcomes, perceptions of important others, and parental behaviors related to those beliefs and expectations (Hoover-Dempsey & Sandler, 1997). In contrast to subjective norms in the theory of planned behavior, where the motivational orientation for action is derived out of significant others' approval

(Ajzen, 1991), the motivational roots of role construction derives from parents' consideration of the relevant responsibilities for, and commitments toward, their child. This motivation arises from self and social affirmation of their role as a parent, which leads them to behave accordingly to fulfil these obligations and remain consistent with the standards attached to the role.

Anticipated regret is also a variable that has been introduced as a separate predictor within the theory of planned behavior. Parents' anticipation that they will regret not performing a behavior that they know might promote the health of their child is likely to have a strong influence on motivation. Recent studies have indicated that parental anticipated regret is a strong unique predictor of parents' intentions to engage in behaviors that promote child health such as breastfeeding (Shepherd, Walbey, & Lovell, 2017) and physical activity (Hamilton, Kirkpatrick, Rebar, White, et al., 2017). Together these results suggest that the decisions of parents of young children to engage in behaviors that promote the health of their child depends not just on their attitudes, subjective norms, and perceived behavioral control, but also on their beliefs related to their perceived moral and social obligations, and the extent to which they will regret not performing the behavior in the future.

A further limitation of the theory of planned behavior, and similar social cognitive theories, is the exclusive focus on reasoned, conscious processes (Ajzen, 2002; Hagger, 2017a). The theory assumes that engagement or desistence from a behavior is the result of a decision-making process involving conscious deliberation over the merits and detriments of the course of action. However, contemporary theoretical approaches in psychology recognize that many everyday behaviors are determined by automatic, non-conscious processes (Hagger, 2017a; Hagger & Chatzisarantis, 2014; Strack & Deutsch, 2004). Such behavioral enactment is fast, efficient, and derived from learned

contingencies between action and conditions in the environment that cue up or determine the behavior. These actions may be akin to habits, which are developed over time through repeated performance of the behavior with consistent presence of cues or contexts that become inextricably linked to the action. The behavior is then enacted in a rapid, efficient way on presentation of these cues. This has given rise to 'dual process' models of behavior, in which behavior is a function of the deliberative and automatic pathways depending on factors such as experience with the behavior and the strength of the cues (Hagger & Chatzisarantis, 2014; Sheeran, Gollwitzer, & Bargh, 2013; St Quinton & Brunton, 2017).

Research examining the role of implicit processes in the context of the transition to parenthood have been relatively sparse. Hamilton, Kirkpatrick, Rebar, & Hagger's (2017) study on sun safety demonstrated the importance of habit as an independent predictor of parents' performance of sun protection behaviors for their child. The habit construct represents the 'automatic' nature of the behavior, and measures referred to the extent to which the behavior was done without thinking or conscious effort. The effects of habit were also independent of intentions, which is consistent with dual process approaches to the theory given that intentions represent the more reasoned, deliberative path to action. While there have been relatively few applications of dual process approach to predict health behaviors in new parents, they offer considerable potential in enabling researchers to gain a more complete understanding of the complex processes that determine health behaviors in this population.

Theory-Based Behavior-Change Interventions

Organizations and health professionals such as public health departments, clinicians, nurses, and parent groups with an interest in promoting child and parent health have aimed to develop effective behavior change interventions that are likely to encourage

health promoting behaviors in new parents. There has been considerable focus on the content, design, and development features of health behavior interventions that will maximize their effectiveness (Abraham, 2012; Leventhal, Weinman, Leventhal, & Phillips, 2008; Michie, 2008). Many past and current health behavior change interventions have been developed on a relatively ad hoc basis focusing on a rudimentary and heuristic understanding of behavior. This has led to literature of behavioral interventions that are poorly described with inconclusive findings with respect to their effectiveness and efficiency. Recent innovations in the field of behavioral medicine and implementation science have aimed to gain a clearer understanding of the components of interventions that are effective in changing behavior across contexts, and to systematize the content of behavioral interventions and their descriptions. The focus is to develop common descriptions and an evidence base informed by behavioral theory that will provide practitioners with clear guidance on the content and design of interventions that are optimally effective in changing behavior. This knowledge means practitioners can then implement their behavior change interventions with a high degree of confidence that they will attain clinically-relevant outcomes in promoting health and reducing chronic disease risk.

The content and description of behavior change interventions has been greatly facilitated by the development of taxonomies of behavior change methods or techniques (Kok et al., 2016; Michie et al., 2011). These are organized lists with definitions of the unique, irreducible components of interventions that are effective in changing behavior. The purpose of the taxonomies is to isolate the individual methods that ‘do the work’ in changing behavior, and provide a common set of terms to describe those methods. The methods have frequently be labelled the ‘active ingredients’ of behavioral interventions. The methods are unique in that they cannot be further broken down into separate methods

or techniques, and each may be used individually or in conjunction with other methods to evoke behavior change in the target population. A number of taxonomies have been proposed, and the general approach has been to identify and refine the number, definitions, and content of techniques through expert consensus. The taxonomies provide investigators and practitioners with the systematic tools necessary to accurately describe behavioral interventions and develop intervention content.

The development of effective behavior change interventions entails a number of important initial considerations relating to the behavioral problem including identifying the health problem and population in need of change (e.g., low levels of physical activity in parents of new born children) and the behavior that needs to change (e.g., promoting regular participation in physical activity) (Abraham, 2012). These initial considerations are important as they require clear specification of the population of interest and the specific behavior that needs to change. The latter considerations may seem obvious, but in many cases interventionists are seldom explicit in the population they wish to target and the specific behavior, or set of behaviors, they wish to change. It is also important to specify means to assess change and the criterion against which clinically-relevant success is defined. For example, progress in smoking cessation could be defined in terms of a reduction in the frequency of smoking, such as the number of cigarettes smoked, but a complete cessation of smoking for a given period of time may be considered the outcome with clinical significance.

Once the target problem, population, and behavior have been defined, the key components of the intervention need to be considered: identification of the key change mechanisms that are responsible for a change in the target behavior, and specification of the behavior change methods that will activate the change mechanisms to evoke behavior change (Abraham, 2012; Bartholomew Eldredge et al., 2016; Hagger, 2017b). These two

components will determine the content of the intervention, the processes by which the intervention is expected to change behavior, and how its effectiveness is to be evaluated. The components entail a basic process model of intervention, which is derived from behavioral theories such as the social cognitive theories identified in the previous section and research on behavior change methods of behavioral interventions. The process model identifies the mechanism by which active intervention content changes behavior by changing internal factors derived from social cognitive theories of behavior, such as those reviewed in the previous section. The basic process model is illustrated in Figure 1. In the model, methods adopted in interventions are depicted as predicting a psychological mediator which, in turn, relates to participation in the behavior. The psychological mediator, therefore, serves as an intermediary between the intervention and behavior engagement and, therefore, describes *how* the intervention works; through changing the social cognitive variables that are the antecedents of health behavioral participation. Identification of the relevant psychological mediator or multiple mediators of an intervention should begin with identifying the key theoretical constructs that have been previously identified as antecedents of the behavior of interest in formative research. For example, parents' intentions to apply sunscreen to their child immediately prior to sun exposure may be related to their attitudes and perceptions of control. These should, therefore, be matched or 'mapped' on to the relevant behavior change methods (Abraham, 2012; Kok et al., 2016). This mapping process is an important step in the development of theory-based behavior change interventions because it provides an explicit link between the content of the intervention and the mechanism by which the content is expected to evoke a change in behavior.

Based on this systematic approach, the starting point for behavior change interventions to promote health behaviors in parents, and to promote parents adopting behaviors to

promote the health of their children, should be the identification of the constructs that should be the targets of behavior change methods. Behavior change methods from taxonomies that are theoretically related to changing the target constructs can then be identified and form the content of future interventions. Although there are many behavior change methods – a recent taxonomy, for example, identified 93 unique methods – some methods are closely aligned with theoretical constructs, have a stronger evidence base for their effectiveness, and more widely used than others (Michie et al., 2013). For example, there are groups or clusters of change methods that relate to particular theoretical constructs. Abraham (2012) and others (Bartholomew Eldredge et al., 2016; Kok et al., 2016) have classified change methods according to the theoretical constructs they target. These include methods for changing personal beliefs (instrumental attitudes), risk perceptions, and feelings (affective attitudes), and normative beliefs (social norms), motivation, and self-efficacy. Methods to change personal beliefs, risk perceptions, and feelings generally rely on provision of information and persuasive communication regarding the behavior of interest, and the possible positive or negative outcomes. For example, positive attitudes toward a behavior can be enhanced by providing information on the benefits of doing the behavior and downplaying or discrediting beliefs about negative aspects or costs; and risk perceptions such as beliefs about susceptibility of an illness and linking it to a behavior such as promoting medication adherence through persuasive communications highlighting the health risks of not taking the medication. Social norms can be enhanced using methods such as providing examples of salient groups to which the individual belongs and what is normally done in those groups, or by providing group-level feedback on behavior. Self-efficacy can be promoted using methods that provide successful experience with the behavior, prompting goal setting, providing positive feedback of successful performance of the behavior, and motivation

can be enhanced by setting personally-relevant goals and incentivizing performance of the behavior. Most of these methods is expected to enhance motivation, but certain forms of motivation, such as intrinsic motivation, can be enhanced using autonomy supportive techniques such as providing rationale, acknowledging conflict, and providing choice (Hagger & Chatzisarantis, 2015).

Behavioral interventions aimed at promoting health behavior in new parents have targeted change in behavioral beliefs and attitudes (e.g., Beardslee, Wright, Rothberg, Salt, & Versage, 1996; Massey, Decety, Wisner, & Wakschlag, 2017). The interventions are often based on social cognitive theories like the theory of planned behavior in which beliefs feature prominently as a predictor of behavior. The interventions aim to change attitudes and beliefs so that they are more positive or favorable toward a particular course of action, such as participating in physical activity or quitting smoking over a given time period and in a given context use persuasive communications that 'present a case' for the health behavior to the population of interest (Johnson, Wolf, & Maio, 2017). Importantly, the messages should serve to emphasize the positive, adaptive outcomes and advantages for performing the behavior, and allay the negative, maladaptive consequences regarding the behavior in accordance with the specific behavioral beliefs identified for that population. For example, research examining parents' beliefs on performing sun safety behaviors for their children cited "provide peace of mind", "lack of accessibility", and "having a rule in place" as important advantages of the behavior (Hamilton, Kirkpatrick, Rebar, White, et al., 2017). The content of the persuasive communication should, therefore, highlight that performing these behaviors will provide parents with peace of mind regarding the child's protection from the sun, and should emphasize the importance of having a rule about protective behaviors and being in the sun (e.g., "no hat, no sun") and make sure that access to sun safety precautions is always available (e.g., hat/bonnet,

sunscreen, umbrellas). In another example, research examining parents' beliefs for their own physical activity behavior cited "improve my parenting practices" and "interfere with my other commitments" as important advantages and disadvantages, respectively of the behavior (Hamilton & White, 2011). Persuasive communication to improve parents' physical activity performance could, therefore, focus on health messages that portray parents as being more tolerant with their children after going for a brisk walk and that interfering with other commitments is not a necessary outcome of regular physical activity, such as providing parents with suggestions of how they can obtain required levels of physical activity that fit within their daily routines (e.g., engaging in more moderately active play with their children, doing house work more vigorously). In summary, health behavior interventions aimed at changing the attitudes and beliefs of new parents should be based on formative research on population- and behavior-specific beliefs matched with behavior change strategies that present the case for the behavior. These should be embedded in persuasive communications using the appropriate delivery method in contexts where new parents are likely to receive the messages.

A further behavior change method that likely impacts motivation through beliefs is goal setting. Theories of goal setting indicate that motivation to engage in a particular behavior can be promoted by emphasizing or highlighting outcomes or goals that are meaningful to the actor. Highlighting meaningful, attractive goals will likely stimulate positive beliefs with respect to engaging in the behavior in future. Research and theory on goal setting suggest that the features and content of goals are important to promoting motivation, and goals are more likely to be pursued if they are consistent with some key features. Promoting setting of appropriate goals that are interesting and engaging, realistic, optimally challenging, measurable, and timed, will likely lead individuals to align their sets of beliefs to be consistent with attaining the goal. For example, *Baby Steps*

(Hamilton, Kavanagh, et al., 2016) is a modular, self-paced program designed to provide infant care and wellbeing information and tools relevant for mothers and fathers during late pregnancy until their infant is around 6 months of age. One specific element to the experimental condition, the *Wellbeing Program*, is that participants can choose tips to send to the *My Plans* tool, which functions as a goal-setting, problem-solving, and behavioral activation tool. Participants are encouraged to develop plans to incorporate the chosen tips into their life including setting a specific date and time when the plan will be attempted, or a regular frequency at which they will complete the plan. For example, a participant using the *Self Care* module could select the *Talk to someone about what's stressing you* tip, and choose to develop a plan to *Book an appointment with my General Practitioner* and to complete the plan on a self-selected date. Participants are able to monitor, review, and update their plans throughout their use of the program, and can mark plans as completed.

The promotion of change in self-efficacy is also a viable target for interventions aimed at promoting the health behaviors in parents. Self-efficacy, a construct reflecting individuals specific self-confidence in engaging in a particular behavior and closely aligned with perceived behavioral control (Bandura, 1986), can be promoted using a number of different behavior change methods including providing experiences of success, modeling the behavior, mental imagery, and self-monitoring. Self-efficacy is promoted through adaptive, positive experiences with behavior, consistent with the premise from social learning theory that individuals' confidence and motivation for behaviors is learned through experience and observation, which can be direct (e.g., experiencing success with the behavior) or indirect (e.g., watching others' successful participation). Behavior interventions can capitalize on this process by providing guidance on how to engage in the behavior successful through role models, providing feedback on successful performance,

prompting individuals to visualize successful participation, and providing opportunities to monitor progress. These strategies promote greater motivation or intentions to participate in the behavior in the future by promoting greater confidence that future performances will be met with success. For example, interventions that have manipulated mastery experience (i.e., prompting successful behavior practice) and vicarious experience (i.e., observing a model performing the behavior) have been shown to produce high levels of self-efficacy, as has providing feedback on past or others' performance (Ashford, Edmunds, & French, 2010; Luszczynska & Schwarzer, 2003).

Given the proliferation of dual process theories and, in particular, the pervasive effects of non-conscious, automatic processes in determining health behavior for many behaviors and across multiple populations (Hagger, 2017a; Hagger, Trost, Keech, Chan, & Hamilton, 2017; Strack & Deutsch, 2004), testing effects of interventions informed by automatic processes may have important implications for behavior change in health domains. When behaviors are determined by social cognitive factors like attitudes and self-efficacy, numerous strategies exist that have been shown to affect behavior change through change in these factors (e.g., attitude change through persuasive communication, self-efficacy change through goal setting). However, such strategies may not be effective when behavior is determined by cognitive processes. For example, new parents attempting to follow a healthy diet may fall back on their habitual eating patterns that have been well-learned, reinforced over time, and are easy to execute. It takes considerable cognitive effort to alter behavior patterns, and, in particular, suppress the well-learned behavioral patterns.

Behavioral scientists have therefore advocated environmental restructuring, cue-monitoring, and action planning as possible strategies to manage habitual behavior (Hagger et al., 2016; Verhoeven, Adriaanse, de Vet, Fennis, & de Ridder, 2014). Cue

monitoring requires the individual to identify the potential cues or prompts that instigate an unwanted behavior and to increase vigilance for situations when the unwanted cue arises. For example, a father trying to quit smoking would identify the situations where he typically smokes and maintain vigilance when those cues arise. Diaries and other monitoring devices can assist in this regard. The goal is for the individual to be consciously aware of the cue and when it occurs rather than the cue appearing unnoticed, a scenario carries with it a high probability that the behavior will be enacted. Once the individual has identified the cue, strategies can be developed to manage them and create alternative courses of action. Environmental restructuring involves changing the environment to reduce or eliminate the potential for cues to initiate an unwanted behavior. Identifying the context or cue that initiates an unwanted behavior is an important first step. For example, for many new parents having unhealthy, 'junk' food available in the household serves as a cue to snacking and eating unhealthily. Ensuring that those foods are not available in the household and replacing them with healthier choices is a simple restructuring activity that removes the cue. Action planning involves developing a plan for an alternative course of action when the cue for the unwanted behavior is presented. Specifying an action plan requires an individual to specify an alternative course of action, when it will be enacted, where it will be performed, and how the individual will perform it. For example, a mother trying to cut down on her alcohol intake may have identified being offered another alcoholic drink by her friend when paying her a house visit or meeting her in a restaurant as a cue. Her action plan might specify refusing the drink in the social situation (when and where) by saying that she is trying to increase her fluid intake and will take a thirst quenching alternative (how). Research has suggested that specification of such plans may lead to the alternative being sufficiently accessible to bypass the well-learned unwanted cued-up by the situation when making decisions

(Adriaanse, Gollwitzer, De Ridder, de Wit, & Kroese, 2011). Together these strategies can be implemented to assist parents break the routine afforded by their automatic, well-learned habitual behaviors in favor of healthier alternatives.

Summary and Conclusion

The transition to parenthood is an exciting new phase in the life of mothers and fathers. It also presents considerable challenges, particularly when it comes to behavioral health promotion and illness prevention. Parents have new responsibilities to engage in health behaviors that will promote the health of the new infant. They also find participating in behaviors that will promote their own health more challenging. We have reviewed research applying social cognitive theories to identify the factors relating to parental health behaviors to promote the health of their child and their own health. Research has identified attitudes, subjective norms, and perceived control and self-efficacy as important behavioral determinants. Research has also identified role construction, group norms, moral norms, and anticipated regret as key factors that motivate new parents to engage in behaviors that promote health in their child. Social factors, such as social support and normative information, are also of particular important to parents for their own behavior. We have also provided a review of how the formative research adopting social cognitive theories can inform behavior change interventions, and the relevant procedures necessary to develop those interventions. Specifically, we outlined the key stages in the process of intervention development including identification of the target behavior and population, the mechanisms that will likely lead to behavior change (e.g., the psychological factors involved), and the behavior change methods that target these mechanisms to bring about change in the behavior, and can be included in behavioral interventions. We have provided examples of the key strategies that might be used to promote health behaviors in new parents including persuasive communications, goal setting, environmental

restructuring, cue-monitoring, and action planning. Although this is not a comprehensive overview of the kinds of strategies that may be used in behavior interventions in the transition to parenthood, it provides significant examples of the importance of utilizing evidence from behavioral science to design interventions that use methods that will be optimally effective in promoting the health behavior in parents and children during the transition to parenthood.

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Figure 1. *Basic process model of the effects of behavior change methods from behavioral interventions on health behavior change mediated by social cognitive constructs*