Understanding personal health thresholds: a conceptual framework for health education

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Abstract

Purpose – This study introduces the personal health threshold model, a new conceptual framework that explains how individuals categorize health behaviors. The model aims to elucidate the psychological mechanisms underlying selective adherence to health behaviors and inform more effective health education approaches.

Design/methodology/approach – The model integrates insights from existing research streams, including compensatory health beliefs, licensing effects, risk perception, health lifestyle profiling, cognitive dissonance, self-exempting beliefs and health behavior clustering. By synthesizing these diverse perspectives, the model provides a comprehensive understanding of how various health behaviors are categorized, maintained and enacted in daily life.

Findings – The model consists of three core components: boundary establishment, boundary maintenance and dual decision-making. Boundary establishment refers to the cognitive categorization of health behaviors into non-negotiable and negotiable behaviors, influenced by various factors. Boundary maintenance elucidates the psychological mechanisms that preserve these boundaries, including compensatory justification, selective risk perception, identity reinforcement and dissonance management. Dual decision-making highlights the fundamentally different decision-making processes for behaviors on either side of personal thresholds.

Originality/value – The model is the first to conceptualize the psychological boundary mechanism that explains selective adherence to health behaviors. It uniquely integrates insights from seven distinct research areas, creating a new theoretical framework that challenges traditional health education approaches. The model offers new directions for developing more effective interventions that work with rather than against these established boundaries.

Keywords Personal health thresholds, Health behavior boundaries, Boundary establishment, Boundary maintenance, Health decision-making, Selective adherence, Health education

Paper type Conceptual paper

1. Introduction

Despite access to abundant health information and increased health literacy, people often create personal thresholds that divide health practices they consistently maintain from those they willingly compromise (Presseau *et al.*, 2022). For instance, a healthcare professional might meticulously avoid tobacco yet routinely sacrifice sleep. A fitness enthusiast could maintain rigorous exercise habits but consistently make poor nutritional choices. These examples suggest that rather than approaching health behaviors as a unified domain, individuals develop implicit boundaries that separate non-negotiable health practices from those deemed acceptable to compromise. This selective adherence pattern represents a significant challenge for health education and promotion efforts (Cockerham, 2005; Cooper, 2019; Knäuper *et al.*, 2004; Meader *et al.*, 2016). Contemporary approaches typically presume that increased knowledge, literacy, awareness, and motivation will consistently improve behavior across health domains (Davis *et al.*, 2015; Presseau *et al.*, 2022). However, the persistence of these personal thresholds indicates that behavior change processes operate through more complex mechanisms than current models suggest.

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Existing theoretical frameworks offer valuable insights into this phenomenon, though none fully captures the threshold concept as a distinct psychological process. Research on compensatory health beliefs demonstrates how individuals justify unhealthy behaviors through mental accounting systems (Knäuper *et al.*, 2004; Rabia *et al.*, 2006). Licensing effects explain how performing healthy behaviors creates permission for subsequent unhealthy choices (Chiou *et al.*, 2011; De Witt Huberts *et al.*, 2012). Risk perception studies reveal how vulnerability assessments vary across health domains (Klein and Helweg-Larsen, 2002), while health lifestyle profiling identifies how behaviors cluster into recognizable patterns (Cockerham, 2005). Additionally, cognitive dissonance research explores how individuals manage inconsistencies between health knowledge and behavior (Cooper, 2019; Stellefson *et al.*, 2006). Work on self-exempting beliefs and health behavior clustering further illuminates aspects of selective adherence (Meader *et al.*, 2016; Noble *et al.*, 2015; Oakes *et al.*, 2004). Despite these contributions, current theories insufficiently explain why individuals simultaneously adhere strictly to certain health guidelines while disregarding others.

This paper proposes a conceptual framework, the Personal Health Threshold Model, that integrates insights from existing research to provide a comprehensive understanding of how various health behaviors are categorized, maintained, and enacted in daily life. Specifically, the model enhances our understanding of three key questions: What factors influence which behaviors become non-negotiable versus negotiable? Which psychological mechanisms maintain these boundaries once they form? How do decision-making processes vary for behaviors on different sides of personal thresholds? By illuminating the architecture of these implicit boundaries, health educators can develop more effective approaches that work with rather than against these psychological structures.

2. Current understanding: related research

The phenomenon of personal health thresholds, while not previously conceptualized as a unified construct, connects to multiple established research streams in health behavior and psychology, such as compensatory health beliefs (Knäuper *et al.*, 2004) and self-licensing (De Witt Huberts *et al.*, 2012). Each of these areas illuminates different aspects of how and why individuals might develop, maintain, and justify differential adherence to health recommendations. By examining these related bodies of research, we can identify both their contributions to understanding threshold behavior and their limitations in fully explaining this phenomenon. The following seven research areas provide complementary perspectives that, when integrated, offer a foundation for conceptualizing personal health thresholds.

2.1 Compensatory health beliefs

Compensatory Health Beliefs (CHBs) function as cognitive strategies through which individuals manage the inherent conflict between pleasure-seeking and health goal adherence (Knäuper *et al.*, 2004; Rabia *et al.*, 2006). As conceptualized by Knäuper *et al.* (2004) and further developed by Rabia *et al.* (2006), CHBs are defined as beliefs that the negative effects of unhealthy behaviors can be compensated for or "neutralized" by engaging in healthy behaviors. Examples include beliefs such as "I can eat this cake because I'll exercise tomorrow" or "The effects of regularly drinking alcohol can be made up for by eating healthy." These beliefs allow individuals to resolve the cognitive dissonance created when desires for immediate gratification conflict with longer-term health goals. The CHB model proposes that when faced with such conflicts, individuals can either resist the temptation, adapt their risk perception or outcome expectancy, or activate compensatory beliefs. Research has demonstrated that these beliefs are not merely theoretical constructs but have measurable impacts on behavior patterns. For instance, Kronick *et al.* (2011) found that compensatory beliefs and intentions significantly predicted caloric intake in dieters. The research further indicates that CHBs represent a relatively stable trait-like tendency, as evidenced by strong test-retest reliability ($r = 0.75$ over

4.5–5 months). While the CHB model effectively explains how individuals maintain inconsistent health behaviors through mental accounting systems, it primarily focuses on compensation. It does not fully address why certain behaviors become non-negotiable while others remain flexible, suggesting that additional psychological processes are involved in determining which health domains become subject to compensatory justification.

2.2 Licensing effects

Licensing effects describe a psychological process related to compensatory beliefs. This phenomenon occurs when performing a healthy behavior creates psychological permission to subsequently engage in unhealthy behaviors (Chiou *et al.*, 2011; De Witt Huberts *et al.*, 2012). The temporal sequence distinguishes licensing from compensatory beliefs. In licensing, healthy behavior precedes and psychologically enables the unhealthy choice. For example, thinking "I exercised this morning, so I can have dessert tonight" represents licensing. In contrast, compensatory beliefs can operate in either temporal direction (e.g. "I can have this dessert because I will exercise tomorrow" or "I can have this dessert because I exercised yesterday"). The research on licensing shows how people use past or planned virtuous behaviors to justify future indulgences. For instance, research has demonstrated that merely planning to engage in healthy behaviors can create licensing effects (Urbszat *et al.*, 2002). These effects operate across different domains of health behavior. However, as De Witt Huberts *et al*. (2012) explained, "Self-licensing, or the tendency to rely on reasons and arguments to justify subsequent gratification, has received surprisingly little attention within research on hedonic consumption" (p. 490). Moreover, licensing theory does not explain why certain behaviors appear immune to licensing effects while others are subject to them (Khan and Dhar, 2006). Additionally, the theory focuses primarily on temporal relationships between behaviors rather than addressing stable thresholds that might exist between negotiable and non-negotiable health behaviors (Khan and Dhar, 2006; Mukhopadhyay and Johar, 2009).

2.3 Risk perception and unrealistic optimism

Research on unrealistic optimism demonstrates that individuals tend to underestimate their personal vulnerability to certain health risks compared to others (Klein and Helweg-Larsen, 2002; Weinstein and Klein, 1996). This optimistic bias varies significantly based on factors including perceived control, personal experience, and emotional salience (Sharot *et al.*, 2007). As Klein and Helweg-Larsen's (2002) meta-analysis reveals, the relationship between optimistic bias and perceived control is particularly robust ($r = 0.31$), with greater perceived control associated with greater optimistic bias. These differential risk perceptions likely contribute to the establishment of personal health thresholds by creating psychological boundaries between behaviors perceived as manageable versus threatening. When individuals perceive greater control over certain health domains, they exhibit stronger optimistic bias, underestimating their personal vulnerability compared to others. This psychological tendency leads them to categorize related behaviors as less risky and thus more negotiable. Conversely, domains with perceived lower control generate less optimistic bias and heightened risk perceptions that strengthen non-negotiable boundaries. This selective risk perception mechanism, driven by differential optimistic bias across health domains, helps explain some aspects of threshold formation, particularly how control perceptions influence boundary placement. Nevertheless, it does not explicitly illustrate the sharp adherence boundaries between distinct health behaviors. It explains variations in risk perception but not the complete process of threshold formation.

2.4 Health lifestyle profiling

In health lifestyle profiling, Cockerham (2005) emphasizes how socioeconomic factors, socialization experience, life choices, and life chances interact to produce recognizable

patterns of health behaviors. This research approach recognizes that individuals do not make isolated health decisions, but rather develop patterned approaches that are not necessarily consistent across all domains. Through latent class analyses, researchers have identified distinct lifestyle clusters, suggesting people adopt packages of health behaviors rather than making independent decisions about each behavior (Mawditt *et al.*, 2016). This perspective helps explain why certain health behaviors often appear together in particular social groups and reinforces the structural dimensions of health lifestyles. Health lifestyle profiling acknowledges the clustering of behaviors and how they form coherent patterns across populations, which is essential for understanding personal health thresholds. However, a limitation is that while this approach effectively identifies and describes behavior clustering, it does not fully explain the psychological mechanisms behind why specific behaviors become part of an individual's core health identity while others remain peripheral. It primarily documents observable patterns without providing deep insights into the formation processes that lead some health behaviors to become non-negotiable personal thresholds while others remain flexible or negotiable in a person's behavioral repertoire.

2.5 Cognitive dissonance in health behaviors

Cognitive dissonance theory, when applied to health behaviors, explains how individuals experience psychological discomfort when their health knowledge conflicts with their actual behaviors (Cooper, 2019; Freijy and Kothe, 2013). This discomfort, as Cooper (2019) describes, creates a drive-like state that motivates people to reduce the inconsistency through various strategies, including changing beliefs, adding new justifying cognitions, or denying responsibility. What's particularly relevant to understanding personal health thresholds is that cognitive dissonance appears to be triggered more strongly for some health behaviors than others, suggesting that dissonance reduction mechanisms may play a role in establishing which behaviors become personally important boundaries. Stellefson *et al*. (2006) found that dissonance-based interventions can effectively change intentions related to diet and physical activity among college students. However, while cognitive dissonance theory effectively explains the psychological mechanisms for managing inconsistency, it does not fully address why dissonance becomes intolerable for certain behaviors but manageable for others. As Cooper (2019) notes in his review, dissonance operates under specific conditions, particularly when people feel personally responsible for bringing about unwanted consequences through their freely chosen actions. This caveat helps explain why individuals might experience strong dissonance regarding some health behaviors while easily rationalizing others. Still, it does not explain the complete process of threshold formation that determines which health behaviors trigger significant dissonance and which do not.

2.6 Self-exempting beliefs

Self-exempting beliefs, as characterized in health psychology research, describe how individuals create cognitive exemptions from health risks despite engaging in behaviors known to be harmful. According to Oakes *et al*. (2004), these beliefs function as psychological "shields" that allow smokers to avoid considering quitting and give them false reassurance about their behaviors. Their research identified four coherent categories of such beliefs: "bulletproof" beliefs (feeling personally immune to health effects), "skeptic" beliefs (doubting medical evidence about smoking and disease), "jungle" beliefs (normalizing dangers because risks are ubiquitous), and "worth it" beliefs (perceiving benefits outweigh risks). These self-exempting beliefs are particularly prevalent among older smokers, those with less education, and heavy smokers, with "worth it" beliefs being powerful independent predictors of smokers not planning to quit. As a limitation, self-exempting beliefs research does not provide explanations for why these beliefs are applied selectively to certain behaviors and not others. It primarily focuses on describing the phenomenon rather than explaining the underlying psychological mechanisms. Additionally, research on self-exempting beliefs has been

predominantly studied in the context of tobacco use, with limited exploration in other health behavior domains (Oakes *et al.*, 2004).

2.7 Health behavior clustering

Research on health behavior clustering demonstrates that risk behaviors tend to co-occur in patterns rather than manifesting randomly (Meader *et al.*, 2016; Noble *et al.*, 2015). As Meader *et al.* (2016) found in their systematic review, certain combinations appear with particular consistency, such as alcohol misuse with smoking (identified in 56% of studies). Noble *et al.* (2015) similarly highlighted the strong association between alcohol and smoking across various measurement approaches and noted high prevalence for the co-occurrence of low fruit and vegetable intake with low physical activity. Unlike health lifestyle profiling, which emphasizes how socioeconomic factors and life choices produce recognizable patterns of behaviors (Cockerham, 2005), clustering research focuses specifically on statistical associations between various behaviors and what factors mediate such associations. Overall, health behavior clustering identifies which behaviors are statistically likely to appear together, while profiling examines why these patterns emerge. The clustering approach acknowledges that health behaviors form meaningful relationships but primarily documents these patterns rather than explaining the psychological mechanisms driving their formation.

In sum, these seven research areas provide valuable but incomplete explanations for the phenomenon of personal health thresholds, suggesting the need for an integrated approach that captures the boundary-driven nature of health decision-making. Table 1 provides a comparative summary of how each theory contributes to understanding personal health thresholds and their limitations in fully explaining this phenomenon.

3. The personal health threshold model

The Personal Health Threshold Model proposes a comprehensive framework that explains how individuals develop, maintain, and navigate boundaries between health behaviors they consistently follow and those they readily compromise. The model consists of three core components (i.e. boundary establishment, boundary maintenance, and dual decision-making) that work together to explain the architecture of personal health thresholds and their influence on health decision-making (see Figure 1).

3.1 Boundary establishment

The Personal Health Threshold Model proposes that individuals cognitively categorize health behaviors into two distinct groups: non-negotiable behaviors that are maintained with high consistency despite challenges, and negotiable behaviors that are subject to compromise, justification, and inconsistent adherence. It is important to clarify that the term "non-negotiable" refers to behaviors that individuals maintain with high consistency and resistance to compromise in typical circumstances, rather than behaviors that are permanently fixed or unchangeable. These boundaries can shift over time due to significant life events, new experiences, or deliberate intervention, but they represent stable psychological categories that guide day-to-day decision-making. The concept of boundary establishment is based on the broader literature on habit stability and identity consistency, though it requires empirical validation. This fundamental boundary establishment represents a critical cognitive process that shapes how individuals approach health decision-making across various domains. Unlike traditional stage-based models that assume similar processes across health behaviors (Weinstein *et al.*, 1998), this model recognizes that individuals simultaneously occupy different stages of change for different behaviors based on whether those behaviors fall above or below personal thresholds. The establishment of these boundaries occurs through multiple intersecting influences.

Table 1. Comparison of theories related to personal health thresholds

Theory	Key contribution to understanding thresholds	Limitations in explaining thresholds
Compensatory Health Beliefs	Explains how individuals maintain inconsistent health behaviors through mental accounting systems that balance unhealthy choices with healthy ones (e.g. "I can eat cake because I'll exercise tomorrow")	Does not address why certain behaviors become non-negotiable while others remain flexible; focuses on compensation rather than boundary formation
Licensing Effects	Demonstrates how performing a healthy behavior creates psychological permission for subsequent unhealthy behaviors; explains the dynamic interplay between behaviors over time	Doesn't explain why certain behaviors appear immune to licensing effects while others are frequently subject to them; focused on temporal relationships rather than stable thresholds
Risk Perception and Unrealistic Optimism	Shows that individuals perceive risks differently across health domains based on factors like perceived control, personal experience, and emotional salience	Doesn't fully account for the boundaries that exist between negotiable and non-negotiable health behaviors; explains variations in risk perception but not threshold formation
Health Lifestyle Profiling	Recognizes that people develop patterned approaches to health that cluster into distinct profiles rather than making independent decisions about each behavior	Doesn't explain the psychological mechanisms behind why specific behaviors become part of an individual's core health identity while others remain peripheral; describes patterns without explaining formation processes
Cognitive Dissonance in Health Behaviors	Explains how people manage the psychological discomfort when health knowledge conflicts with behavior; shows that dissonance is triggered more strongly for some behaviors than others	Doesn't address why dissonance becomes intolerable for certain behaviors but manageable for others; focuses on managing inconsistency rather than explaining why boundaries form
Self-exempting Beliefs	Demonstrates how individuals create cognitive exemptions from health risks despite engaging in risky behaviors through various justification strategies	Doesn't explain why these beliefs are applied selectively to certain behaviors and not others; focuses on maintaining unhealthy behaviors rather than threshold formation
Health Behavior Clustering	Shows that health behaviors tend to group together in patterns that aren't always predictable based on traditional models	Primarily describes these patterns rather than explaining the psychological mechanisms that drive their formation; identifies associations without explaining boundaries

Source(s): Author's own work

Experiential factors constitute a primary influence on boundary establishment, particularly personal and family health history. Individuals who have experienced or witnessed significant health consequences related to specific behaviors are more likely to establish those behaviors as non-negotiable. For instance, someone who has experienced a family member's lung cancer diagnosis may establish smoking abstinence as a firm non-negotiable boundary. The vivid, concrete nature of personal experience creates more psychologically accessible risk representations compared to abstract statistical information, thereby influencing which health domains become subject to strict boundaries (Kapitány-Fövény, 2022; Stapel and Velthuijsen, 1996).

Social-cultural factors shape boundary establishment through multiple mechanisms, including cultural norms, reference group standards, and identity-relevant behaviors (Lamont and Molnár, 2002). Health behaviors that are strongly normative within one's cultural or social

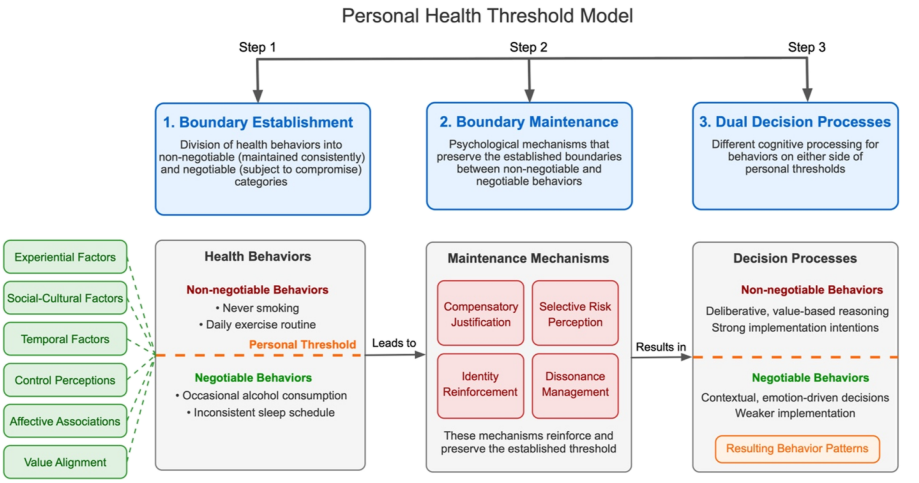

Figure 1. The personal health threshold model. Source: Author's own work

reference groups are more likely to be established as non-negotiable boundaries, particularly when deviation from these norms carries social consequences (Geber *et al.*, 2021). For example, in social groups where regular exercise is highly valued, individuals are more likely to establish consistent physical activity as a non-negotiable health boundary. Additionally, certain health behaviors are tightly linked to social identities, making adherence to these behaviors a matter of identity affirmation rather than merely health promotion (de Hoog and Pat-El, 2024). These social-cultural influences explain why personal health thresholds often cluster within communities and social networks, creating recognizable patterns of health behavior that reflect shared boundary establishments (Marquez *et al.*, 2014; Raza and Martinez, 2023).

Temporal factors influence which behaviors become non-negotiable through the differential impact of immediate versus delayed consequences. Behaviors with immediate, tangible benefits or consequences are more likely to be established as non-negotiable compared to those with primarily delayed effects (Adams, 2012; Hall and Fong, 2007). For instance, the temporal influence helps explain why individuals might strictly maintain hydration during exercise (with immediate performance implications) while compromising on long-term dietary patterns (with delayed health consequences). This temporal dimension of boundary establishment aligns with research on temporal discounting in health decision-making (Silva, 2017), but extends this work by proposing that discount rates vary across the negotiable/non-negotiable boundary.

Control perceptions also influence boundary establishment. Behaviors perceived as more controllable are more likely to become non-negotiable, whereas those viewed as more challenging to control tend to remain negotiable (Hagger *et al.*, 2022; Rodgers *et al.*, 2008). This control dimension helps explain why individuals with similar health knowledge may establish entirely different boundaries. They differ not in their understanding of health recommendations but in their perceptions of which behaviors they can realistically maintain. These control perceptions are not merely reflections of actual behavioral difficulty but are shaped by past experiences, vicarious learning, social support resources, and environmental constraints (Hagger *et al.*, 2022).

Moreover, affective associations with health behaviors influence boundary placement (Ferrer and Gillman, 2023). Behaviors associated with positive affect or emotional relief are more likely to be established as negotiable, as the immediate emotional benefits of these behaviors create stronger competing motivations against health goals. Conversely, behaviors

that initially require affective sacrifice but subsequently generate positive emotions through goal achievement may more readily be established as non-negotiable. This affective dimension helps explain why hedonically rewarding behaviors such as the consumption of highly palatable foods or engagement with screen-based entertainment often remain in the negotiable category despite knowledge of health implications. The strength of affective associations can override cognitive risk assessments, creating boundaries that appear inconsistent when viewed solely through a risk-analysis lens (Lawton *et al.*, 2009).

Lastly, value alignment between specific health behaviors and broader personal values constitutes another crucial influence on boundary establishment. Health behaviors that directly support or express important personal values are more likely to be established as non-negotiable compared to those with weaker value connections. For instance, an individual who deeply values environmental sustainability might establish plant-based eating as a non-negotiable health behavior. The integration of health behaviors with fundamental values creates resistance to boundary crossing, as violations would constitute not merely health compromises but value inconsistencies that threaten a coherent sense of self (Sagiv and Roccas, 2021). This mechanism underscores the importance of understanding individuals' broader value frameworks when assessing their personal health thresholds.

These multiple influences on boundary establishment interact dynamically rather than operating in isolation. The Personal Health Threshold Model proposes that boundary establishment represents an emergent property arising from the complex interplay between experiential, social-cultural, temporal, control-related, affective, and value-based factors. This multifaceted approach to boundary formation explains why established boundaries demonstrate remarkable stability over time. It is important to note that while boundary establishment and boundary maintenance are presented as distinct processes for conceptual clarity, there is considerable overlap between these factors. Some influences both help to establish which behaviors become non-negotiable and subsequently maintain those boundaries over time through ongoing value reinforcement.

3.2 Boundary maintenance mechanisms

Once established, these boundaries between negotiable and non-negotiable health behaviors are maintained through four primary psychological mechanisms: compensatory justification, selective risk perception, identify reinforcement, and dissonance management. While these maintenance mechanisms are distinct from establishment factors, some boundary influences (particularly value alignment) operate in both establishment and maintenance phases, creating reinforcing cycles that strengthen personal health thresholds over time.

3.2.1 Compensatory justification. Drawing from research on Compensatory Health Beliefs (Knäuper *et al.*, 2004) and Licensing Effects (Chiou *et al.*, 2011), compensatory justification describes how individuals use their adherence to non-negotiable behaviors to rationalize their compromise on negotiable ones. For example, an individual might justify poor dietary choices by referencing their consistent exercise routine, thinking, "I never miss my morning run, so having this dessert is acceptable." Unlike general compensatory beliefs that might occur between any behaviors, this mechanism operates specifically across the boundary between non-negotiable and negotiable behaviors, creating a pattern where non-negotiable behaviors frequently serve as justification for negotiable ones.

3.2.2 Selective risk perception. Selective risk perception synthesizes insights from Risk Perception and Unrealistic Optimism research (Weinstein and Klein, 1996) and Self-exempting Beliefs (Oakes *et al.*, 2004). It describes how individuals amplify perceived risks associated with non-negotiable behaviors while simultaneously minimizing the risks associated with negotiable ones. This differential risk perception is not merely a product of knowledge gaps but represents an active cognitive process that maintains threshold boundaries (Mills *et al.*, 2008; Siegrist and Árvai, 2020). For instance, an individual might perceive the health risks of smoking as severe and personally relevant while downplaying comparable

statistical risks associated with excessive alcohol consumption. This selective amplification and minimization of risks helps explain why certain health recommendations are followed vigilantly while others with similar evidence bases are disregarded.

3.2.3 Identity reinforcement. Building on Health Lifestyle Profiling (Cockerham, 2005) and Health Behavior Clustering (Noble *et al.*, 2015) research, identity reinforcement explains how non-negotiable behaviors become integrated into an individual's core identity while negotiable behaviors remain psychologically peripheral. This process creates a situation where adhering to non-negotiable behaviors affirms one's self-concept, while negotiable behaviors are viewed as less connected to "who I am." For example, someone might strongly identify as "a runner" or "someone who never smokes" while viewing their sleep habits as situational behaviors rather than identity markers. This differential identity integration strengthens boundaries by making violations of non-negotiable behaviors feel like threats to identity, while violations of negotiable behaviors merely represent circumstantial compromises.

3.2.4 Dissonance management. Derived directly from Cognitive Dissonance research in health contexts (Cooper, 2019; Freijy and Kothe, 2013; Stellefson *et al.*, 2006), the mechanism of dissonance management explains why individuals experience more substantial cognitive dissonance when violating non-negotiable boundaries compared to negotiable ones. When faced with similar knowledge about the health impacts of different behaviors, individuals employ dissonance reduction strategies more actively for negotiable behaviors. These strategies include adjusting beliefs about health impacts, focusing on uncertainties in research evidence, or emphasizing contextual factors that justify exceptions (Freijy and Kothe, 2013).

The model further proposes that the interaction between these four maintenance mechanisms creates a self-reinforcing system that preserves personal health thresholds even in the face of new information or changing circumstances. Understanding these maintenance mechanisms provides valuable insight into why health behavior patterns can remain stable despite educational interventions.

3.3 Dual decision processes

The Personal Health Threshold Model proposes that behaviors categorized on either side of established personal thresholds undergo fundamentally different decision-making processes. Behaviors established as non-negotiable undergo primarily deliberative, value-based decision processes characterized by several features (Berkman, 2018). First, these behaviors might evoke automatic consideration of core values and identity-relevant goals during decision points. Moreover, non-negotiable behaviors benefit from stronger implementation intentions and action planning (Bailey, 2019). These implementation intentions effectively automate responses to high-risk situations, reducing the cognitive resources needed to maintain consistent behavior patterns. For example, someone who considers daily exercise non-negotiable still benefits from implementation planning such as "If it's raining, then I will use the indoor gym" or "If I'm traveling, then I will pack resistance bands." While the commitment to exercise remains non-negotiable, the specific behavioral execution requires planning to maintain consistency across varying circumstances. Non-negotiable refers to the psychological commitment and resistance to compromise, not to behavioral automaticity. Lastly, the decision to maintain non-negotiable behaviors is less influenced by situational variables such as mood, social pressure, or convenience factors.

In contrast, behaviors categorized as negotiable undergo more contextual, emotion-driven decision processes with distinct characteristics. First, these behaviors are subject to greater affective influence during decision-making. Immediate emotional states and anticipated affective outcomes exert stronger influence on negotiable behavior decisions compared to non-negotiable behaviors (Angie *et al.*, 2011). Negotiable behaviors also demonstrate weaker implementation planning and greater reliance on situational cues (Bailey, 2019). Rather than developing robust contingency plans, individuals approach negotiable behavior decisions with greater flexibility and situation-specific reasoning. Finally, decisions regarding negotiable

behaviors demonstrate higher sensitivity to social comparison information. While non-negotiable behaviors remain relatively stable regardless of peer behavior, negotiable behavior decisions more readily incorporate social norms and reference group standards as decision inputs.

The dual decision-making process highlights that different decision mechanisms operate depending on behavior categorization. This dual processing framework explains why self-regulatory fatigue impacts health behaviors unevenly (Cameron and Webb, 2020; Pignatiello *et al.*, 2020). Negotiable behaviors deteriorate more rapidly under stress or cognitive depletion, while non-negotiable behaviors remain relatively resilient. The model also addresses why traditional interventions focusing solely on knowledge or motivation produce inconsistent outcomes across health domains. These approaches may change negotiable behaviors but rarely affect established non-negotiable behaviors. Effective interventions should be tailored to behavior categorization rather than applied uniformly across all health domains.

4. Application to health education

The Personal Health Threshold Model offers practical implications for health education by providing a framework that acknowledges how individuals categorize health behaviors. This model is particularly applicable for health educators working in clinical settings, community health programs, workplace wellness initiatives, and individual counseling contexts where there is flexibility to tailor interventions to personal health thresholds. While health educators in formal educational settings (such as schools) may find the conceptual framework useful for understanding student behavior patterns, their ability to implement threshold-based interventions may be limited by curriculum requirements and the educational rather than behavior-change focus of their roles.

Rather than assuming uniform approaches to all health domains, this model recognizes that effective interventions must work with rather than against established psychological boundaries. The goal is not to make all healthy behaviors non-negotiable, which would be unrealistic and potentially counterproductive. Instead, interventions should help individuals consciously evaluate their current thresholds, understand the factors that shaped them, and make informed decisions about which behaviors warrant non-negotiable status based on their personal values, circumstances, and health priorities. Health educators can develop targeted strategies derived directly from the model's three core components to enhance intervention effectiveness.

4.1 Boundary establishment interventions

Interventions at this stage focus on helping individuals identify and reflect on their current health behavior categorizations and the factors that influenced their formation. Health educators can utilize multiple approaches to guide this identification process, including structured self-assessment exercises, narrative techniques to explore personal experiences, group discussions on social norms and identity, values clarification activities, and reflective journaling to examine control perceptions and affective associations. These approaches facilitate individuals' self-discovery and articulation of their personal health thresholds. Health behavior change is not a uniform process, but rather a differentiated one, where individuals hold varying degrees of commitment to different behaviors (Michaelsen and Esch, 2022, 2023). Interventions should incorporate strategies that help individuals identify and reflect on the experiential, sociocultural, temporal, control-related, affective, and value-based factors that shape their non-negotiable and negotiable behavior categories. By fostering an understanding of these influences, health educators can empower individuals to critically evaluate their existing boundaries and make informed decisions about modifying them. The goal is conscious threshold evaluation rather than automatic boundary reassignment, empowering individuals to make deliberate choices about which behaviors deserve non-negotiable status based on evidence, personal circumstances, and authentic priorities.

4.2 Addressing maintenance mechanisms

Once boundaries are understood, interventions can address the four maintenance mechanisms that preserve these psychological divisions. Compensatory justification requires educators to move beyond simply highlighting the dangers of trading off behaviors. Instead, interventions should foster a deeper understanding of the cumulative impact of multiple behaviors, emphasizing synergistic effects and the interconnectedness of health outcomes (Zhao *et al.*, 2021). For selective risk perception, educators should employ personalized risk communication strategies to make the risks of negotiable behaviors more salient. Identity reinforcement necessitates interventions that go beyond simply promoting behavior change. Educators should facilitate identity exploration, helping individuals articulate how non-negotiable and negotiable behaviors align with their core values and aspirations. While non-negotiable behaviors are often tied to values, they are not always healthy; educators must facilitate critical evaluation and value re-alignment when needed. Furthermore, social support strategies can be integrated to foster a sense of belonging and community among individuals who share similar health-related identities. Finally, dissonance management, as conceptualized within the model, highlights the disparate levels of cognitive dissonance experienced when individuals contemplate or enact deviations from their established health behavior boundaries (Cooper, 2019; Freijy and Kothe, 2013). Therefore, health education should teach individuals to recognize and critically evaluate their dissonance reduction strategies for non-negotiable and negotiable behaviors. Educators can utilize role-playing and cognitive behavioral techniques to help individuals make balanced, evidence-based health decisions.

Moreover, understanding the interplay between maintenance mechanisms across non-negotiable and negotiable behaviors is crucial for educators to develop interventions that successfully change unhealthy behaviors without risking the deterioration of existing healthy behaviors. Consider an individual who maintains regular exercise as a non-negotiable behavior but treats healthy eating as negotiable. The compensatory justification mechanism creates an interplay where their consistent exercise routine ("I never miss my morning workout") frequently serves to rationalize poor dietary choices ("so I can eat this fast food"). An effective intervention at this level would work with rather than against these established mechanisms. Rather than attempting to make healthy eating immediately non-negotiable (which could create psychological reactance), the intervention might begin by reframing the compensation relationship to help the individual understand that exercise and nutrition have synergistic rather than substitutable effects on health outcomes. For example, showing how proper nutrition enhances exercise performance and recovery makes the two behaviors mutually reinforcing rather than competing. The intervention could also leverage identity reinforcement by connecting improved nutrition to their existing identity as "someone who exercises consistently," positioning dietary improvements as supporting rather than threatening their established non-negotiable behavior. Finally, the approach would involve gradual boundary adjustment, beginning with small dietary improvements that feel consistent with their exercise identity, such as post-workout nutrition, rather than attempting wholesale dietary changes. By addressing these maintenance mechanisms at a deeper level, health education interventions can promote sustainable behavior change and empower individuals to navigate the complexities of their personal health thresholds.

4.3 Leveraging dual decision processes

Understanding that different decision processes govern negotiable versus non-negotiable behaviors allows for tailored intervention approaches. While non-negotiable behaviors are resistant to change, it is crucial to ensure they are both healthy and appropriate for the individual's circumstances. For example, while "3 miles of running every morning" might be a healthy non-negotiable for some, it could be inappropriate for someone with a medical condition or physical limitations. Interventions for non-negotiable behaviors should therefore

not only reinforce value-driven, deliberate choices but also include a critical evaluation of the behavior's suitability. For negotiable behaviors, interventions must address the contextual and emotion-driven nature of decisions through strategies such as cognitive restructuring techniques for managing immediate cravings, environmental modifications to reduce tempting cues, and social support systems that provide alternative sources of emotional regulation (Moffitt *et al.*, 2012). Rather than attempting to eliminate the negotiable category entirely, effective interventions help individuals make more conscious, health-supporting choices within their existing threshold framework.

5. Conclusion

The Personal Health Threshold Model provides a cohesive framework that explains the common yet under-conceptualized phenomenon of selective health behavior adherence. Specifically, the model recognizes that individuals establish personal boundaries between negotiable and non-negotiable health behaviors. It illuminates why people simultaneously maintain strict adherence to certain health guidelines while readily compromising on others. Rather than introducing an entirely new concept, this framework integrates insights from compensatory health beliefs (Knäuper *et al.*, 2004; Rabia *et al.*, 2006), licensing effects (De Witt Huberts *et al.*, 2012), risk perception (Klein and Helweg-Larsen, 2002; Weinstein and Klein, 1996), health lifestyle profiling (Cockerham, 2005), cognitive dissonance (Cooper, 2019; Stellefson *et al.*, 2006), self-exempting beliefs (Oakes *et al.*, 2004), and behavior clustering research (Meader *et al.*, 2016; Noble *et al.*, 2015) to provide conceptual clarity around this boundary-driven approach to health decision-making.

The model makes a significant theoretical contribution by elucidating three key aspects of personal health thresholds: how individuals establish which behaviors become non-negotiable versus negotiable; what psychological mechanisms maintain these boundaries once established; and how decision-making processes differ fundamentally for behaviors on either side of personal thresholds. This integrated approach helps explain why traditional health behavior change interventions sometimes fail despite increased knowledge and motivation (Rothman and Sheeran, 2021). They often fail to address the boundary architecture that shapes how health information is processed and translated into action. Moreover, the model offers critical insights for health education practices. In its core, educators should guide individuals in understanding their unique health boundaries, addressing the cognitive mechanisms that maintain them, and tailoring interventions to the distinct decision-making processes governing negotiable and non-negotiable behaviors.

Several limitations in the current research should be noted. First, while the model is derived from and logically integrates several established health behavior theories, it is primarily conceptual. Empirical studies are needed to validate the model's components and test its applicability across diverse populations and health behaviors. Second, the model focuses on individual-level processes, potentially overlooking broader systemic influences on health behavior. Future research should explore how social determinants of health and policy environments interact with personal thresholds. Third, the model identifies key influences on boundary establishment. However, the relative importance and interplay of these factors remain unclear. Quantitative studies could examine which factors most strongly predict threshold formation. Finally, given that this is a new concept, there are various additional factors that can be included to further improve the model. For example, the role of psychological needs such as autonomy, relatedness, and competence in the health threshold framework may provide additional insight (Ryan and Deci, 2017). Also, personality traits such as conscientiousness and self-control can also be integrated in the model (Joyner *et al.*, 2018). These traits can shape an individual's ability to adhere to non-negotiable behaviors or to navigate the compromises associated with negotiable behaviors. In conclusion, the Personal Health Threshold Model offers a new perspective for understanding selective adherence to health behaviors. By integrating insights from existing theories and outlining key components

of threshold-driven decision-making, this model provides a foundation for future research to build upon.

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