**Hope, Uncertainty, and Control:**

**A Theoretical Integration in the Context of Serious Illness**

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**Abstract**

Background: Hope has been a topic of interest across many centuries and among diverse cultures, gaining particular relevance in crisis and change-seeking times. Research has shown that hope plays an important role in both the context of everyday life as well as in the context of illness. This paper presents an integrative theory of hope, which incorporates uncertainty and control as key drivers of the hope process and also includes appraisal and meaning.

Discussion: The new hope theory states that hope emerges when a specific situation is appraised as uncertain and involves the discernment of the utility of primary and secondary control. For example, in the context of high uncertainty and low control, importance is given to the meaning-making and transcendence in maintaining hope. In the context of low uncertainty and high control, importance is given to the agency and self-efficacy components of hope.

Conclusions: Although this integrative theory is based on current theory and evidence, it awaits empirical evidence for the integration of hope, uncertainty, and control in a process-oriented model of hope. The integrative theory has clinical utility, particularly for serious illness and palliative. care where uncertainty, hope and control transform with the trajectory of the illness.

Keywords: hope, uncertainty, control, appraisal, meaning, theory, serious illness

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**1.0 Overview**

Hope has been a topic of interest across many centuries and among diverse cultures. Perspectives on hope run the gamut from aspirational thinking in everyday life to the development of theories that reflect content from different disciplines [1] (e.g., psychology, medicine, theology, philosophy). Whereas there may be no consensual conceptual definition of hope among these disciplines, research has shown that hope plays an important role in both the context of everyday life as well as in the context of illness. For example, higher levels of hope are consistently related to better outcomes in academics, athletics, physical health, psychological adjustment, psychotherapy [2], and subjective well-being [3]. In addition, hope has also been positively related to behaviors relevant for primary prevention, such as being a non-smoker [4], consuming fruits and vegetables [5], and engaging physical activity [6]. Finally, a meta-analysis of interventions for people receiving palliative care has indicated that hope, regardless of the operational definition [7], can change (g=.61) [8]. Thus, although the construct of hope appears to be important in everyday life, is amenable to intervention, and is viewed as a critical aspect of medical care, the lack of consensus on its critical components seems to reflect the lack of development of a comprehensive theory of hope.

Hope has been a particularly important component of the medical encounter, especially in the context of serious illness in which there is high uncertainty regarding the effectiveness of treatments. Patients have consistently expressed the desire and need of finding hope despite adverse health circumstances [9][10][11]. Moreover, research has shown that hope is associated with less physical symptoms and less psychological distress in cancer patients [12] and it has been positively associated with resilience [13], effective coping, and increase quality of life in patients with advanced illnesses [14] [15] [16]. In this sense, hope is an inherently critical component of medical care.

Like hope, uncertainty is an important phenomenon in health care because of its many potential psychological effects, both negative and positive. Research has demonstrated that uncertainty is related to fear, anxiety, perceptions of vulnerability, and avoidance of decision-making [17], all of which may impact an individual´s health status and prognosis. Perhaps the most relevant context that illustrates the relationship between hope and uncertainty in the medical setting is the communication and understanding of prognostic information where uncertainty may be considered a prerequisite for hope Christakis [18].

None of the prevailing hope theories explain how hope is related to or affected by uncertainty. An adequate conceptual framework for hope and uncertainty is critical for incorporating hope in a meaningful way in the lives of people who are navigating a variety of health issues ranging from prevention to coping with serious chronic or terminal illnesses. Hence, the focus of this paper is the development of an integrated theory of hope that builds on current theories and includes, among other things, the constructs of uncertainty and control.

**1.1 Uncertainty**

Inherent in the concept of hope is uncertainty, which can vary greatly depending on what is hoped for; however, hope by its very nature references some future aspirational or undesirable states or goals that have varying probabilities of materializing. Hillen et al. [17] identified three specific sources of uncertainty: probability (randomness or indeterminacy of future outcomes), ambiguity (lack of reliability, credibility, or adequacy of information), and complexity (features of information that limit understanding). Following an appraisal of uncertainty and depending on whether the individual further appraises the situation as positive or negative, different cognitive (e.g., threat, denial, vulnerability, and doubt vs. opportunity, acknowledgment, confidence, faith), emotional (e.g., worry, fear, disinterest, aversion, despair vs. calm, courage, curiosity, attraction, and hope), and behavioral responses (e.g., avoidance, inaction, deferral, inattention vs. approach, action, decision making, information seeking) may occur. Thus, the pathway to hoped-for goal or outcome may involve the discernment of many features of that goal or hoped-for state including varying degrees of uncertainty of achieving the goal.

Uncertainty is an important concept in health care, especially regarding chronic and life-threatening illnesses as there are multiple practical and existential uncertainties in those circumstances. The dominant model of uncertainty in health was developed by Han et al. [19] in which a three-multidimensional taxonomy was presented to describe uncertainty in health care according to its fundamental sources, issues, and loci. Uncertainty with regard to issues may be scientific or data-oriented (e.g., uncertainty related to diagnosis, prognosis, causal explanations, and treatment options), practical or system-centered processes (e.g., uncertainty regarding structures of care or processes of care), and personal or patient-centered (e.g., uncertainty regarding psychosocial or existential issues). Finally, the perception of uncertainty is critical and may vary from one person to another (e.g., physician and patient) and from one situation to another (e.g., treatment for a skin wound versus for COVID-19) and may involve a complex processing of features that are critical in discerning hope for some desired outcomes.

In addition to the inherent uncertainty in illness, particularly serious or novel illness, there are differences in the intolerance of uncertainty, which is the tendency of an individual to consider the possibility of a negative event occurring as unacceptable irrespectively of the probability of occurrence [20][21]. Intolerance of uncertainty has been associated with negative outcomes such as excessive worrying and distress [22] low appraisals of self-control and low levels of problem-focused coping [23], and may serve as an essential transdiagnostic feature across anxiety disorders and depression [20]. Thus, intolerance of uncertainty may negatively bias the process of discerning uncertainty in hoped-for goals and, essentially, exaggerate the intensity of uncertainty. In summary, hope and uncertainty may be indigenous to human existence and manifest in process of navigating serious illness.

**1.2 Hope**

In an attempt to further integrate hope and uncertainty, theoretically, it is important to review theories of hope developed by Snyder [2] and Herth [24], which, based on a systematic review of the literature [8] are the most prevalent in the research on hope. Snyder’s theory presents hope as a “positive motivational state that is based on an interactively derived sense of successful (a) agency (goal-directed energy), and (b) pathways (planning to meet goals)” [2]. The *cognitive* component of the theory assumes that human actions are oriented toward goals, which may be short-term or long-term, but need to be of sufficient value or meaning to reach the conscious thought. To attain their goals, individuals must view themselves as capable of generating workable routes (i.e., pathways based on planning) to achieve those goals. Inherent in Snyder’s hope theory is the *motivational* component of agency, the perceived capacity to use one’s pathways to reach the desire goals [25]. According to Snyder’s theory, high-hope is associated with high levels of agency and pathways, generating more goals, working to achieve those goals, and generating alternative ways to overcome unattained goals. In contrast, a low-hope is associated with insufficient agency and pathways that lead to perceptions of a low probability of achieving specific goals, a focus on failure rather than success, an inability to generate alternative pathways, and a generally negative emotional state during goal-related activities [26].

Snyder’s theory may be relevant in the short-term but is less likely to account for the path to a hoped-for state under circumstances where current agency may be low, that is where there is no clear current pathway (e.g., I am doing what I can to improve my diet but not sure that will affect the progression of cancer, which is my goal) or where goals or outcomes are more long-term and difficult to predict under any circumstances (e.g., hope I can remain in remission for many years, hope I can live long enough to see my grandchildren grow into adults).

Another dominant theory of hope that is more expansive than Snyder’s is that of Herth and colleagues [24][27][28]. Consistent with the notion that hope is an antecedent to desired outcomes, Herth [24] described hope as “an inner power that facilitates transcendence of the present situation and movement toward a new awareness and enrichment of being. It is dynamic and complex in nature” [24]. In a study in which she explored the meaning of hope in terminally ill adults, Herth concluded that hope was determined by interpersonal connectedness, aims, a spiritual base, specific personal attributes (i.e., determination, courage, and serenity), positive emotions (i.e., lightheartedness), positive memories, and self-esteem (i.e., an affirmation of worth) [24]. Thus, Herth’s theory is more expansive than Snyder’s and does take into account the notion that hope can be transcendent, that is reach far beyond current circumstances where pathways may not be clearly defined or even currently feasible.

These two theories of hope overlap in terms of the focus on goals or expectancies in the future. Snyder’s theory includes more specific goals and the motivational component is captured in the concept of agency or self-efficacy [29], that is the belief that one can execute behaviors to attain a certain outcome. In addition to goals or expectancies, Herth’s theory includes a more expansive appraisal of the situation, which includes the role of spirituality and transcendence [30]. That is, Herth’s theory, like Snyder’s accounts for situations in which the person appraises expectancies about outcomes as attainable by engaging in goal-seeking behaviors, but also includes goals or expectations that are less definite or long-term but, nonetheless, important (e.g., hoping that a new regimen of chemotherapy works; hoping to survive long enough to celebrate a certain holiday or milestone). In fact, Herth’s theory allows for the situation where after appraisal, personal agency may not be viewed as an option or even a responsibility of the person and, therefore, the hoped-for outcomes may not be viewed as under one’s control (e.g., hoping medical science progresses more quickly in finding a remedy or a way to slow the progression of disease).

**1.3 Control**

An integrated theory of hope should, in addition to uncertainty, also include the construct of control. Inherent in Western philosophical assumptions of control (e.g., de Charms [31]) is the idea that humans want to produce behavior-event eventualities and thus, when possible, exert control over the environment and experience negative affect when they are confronted with a situation in which they have no control. Based on these assumptions, Rothbaum et al. [32] described control as a two-process construct consisting of primary control and secondary control. Primary control involves personal agency, that is, attempts to change the world to fit the self´s needs and wishes, and secondary control involves bringing the individual into line with environmental forces [32]. The authors further describe four types of secondary control processes: predictive (i.e., anticipating events/outcomes in an attempt to minimize negative affective states), illusory (i.e., define outcomes as chanceful), vicarious (i.e., vest outcomes in powerful others – e.g., physician, God), and interpretative (i.e., derive meaning from events or outcomes in order to define the situation as beneficial – e.g., benefit finding).

Primary control is almost always characterized by active behavior which engages the external world, whereas secondary control is characterized by cognitive processes concentrated within the individual [33]. However, it has been proposed that secondary control, which targets internal processes to help the individual cope with uncertainty, failure or loss, may in some instances ironically foster primary control by enhancing motivational resources towards the original goals [24] or toward a new set of goals that arise from a reappraisal of the context. For example, a patient diagnosed with an advanced disease may realize that the goals of treatment are not curative and may engage in secondary control (e.g., deciding to accept and letting go, putting his trusting or confidence in God or someone else, etc., which may help them reduce uncertainty). At the same time, this new context may motivate the patient to be active and agentic in enhancing personal relationships or in enhancing control of diet, exercise, or other agentic behavior. In addition, secondary control may be a way to achieve perceived control; that is, managing the situation even with secondary control may provide a sense of self-regulation or control [34], or it can be a facilitator of emotion-focused coping [35], which may provide acceptance of the situation. Secondary control may also allow for the maintenance of hope in the face of uncertainty, through vicarious secondary control (e.g., placing faith in a physician’s care to achieve outcomes, placing outcomes in “God’s hands”). One specific type of coping, religious/spiritual coping, has been associated with secondary control strategies such as “letting go,” that is relinquishing control of outcomes to God or a higher power [36][37].

**1.4 Appraisal and Meaning**

The integration of hope, uncertainty, and control represents a platform for a more inclusive model of hope and a framework for its utility in the context of health and illness. However, in order to develop a more dynamic, process model we propose the inclusion of appraisal and meaning. Appraisal theory was developed by Lazarus [38][39] and was initially applied to psychological stress and also later applied to understanding emotions [40]. The original theory differentiated between primary and secondary appraisal. Primary appraisal seeks to establish the significance or meaning of an event that is “whether or not what is happening is relevant to one’s values, goal commitments, beliefs about self and the world, and situational intentions,” [ [41], p. 42]; whereas, secondary appraisal is used to assess the capacity of personal resources to manage the situation.

In a revision of the appraisal model, seven appraisals of events are presented that influence the course of action and are consistent with the integration of hope, uncertainty and control. Thus events or outcomes can be appraised in terms of 1) unexpectedness (not unexpected vs. unexpected), 2) situational state (motive consistent vs. motive inconsistent – whether the event is wanted or not), 3) motivational state (aversive/appetitive – whether the event is related to a desire to get less of something punishing or a desire to get more of something rewarding), 4) probability (uncertain vs. certain), 5) agency (circumstance caused, other person caused, self-caused), 6) control potential (low vs. high control potential), and 7) problem type (instrumental vs. intrinsic, whether a motive-inconsistent event is unwanted because it blocks the attainment of a goal or unwanted because of some inherent characteristic) [42]. According to this model, conjoint representations based on specified appraisals of a goal or expectation would determine the course of hope [43]; for example, motive-consistent, certain, high control, self-caused would represent an appraisal for a hope process that would engage high self-efficacy (effective pathways) to goal attainment. Alternatively, motive-consistent, uncertain, low control, other caused would represent an appraisal for a hope process that might involve transcendence or faith in powerful others as a means of maintaining hoped-for goals.

We would add one more dimension to the appraisal process, meaning. Meaning has been described as an important hope component [44][45] and can be tied to appraisal, uncertainty, and control. Although uncertainty in the context of illness has been defined as the inability to construct meaning (i.e., when a cognitive schema cannot be formed) [46], the approach espoused in this paper places the discernment of meaning in the process of primary appraisal, which seeks to establish an event's significance or meaning [47] [48].

**2.0 A Proposal for the Integration of Hope, Uncertainty, Control, Meaning and Appraisal**

An adequate conceptual framework for hope, uncertainty and control is critical for incorporating hope in a meaningful way in the lives of people who are navigating a variety of health issues ranging from prevention to coping with serious chronic or terminal illnesses. Moreover, a comprehensive theory would also allow for the a more broad-based assessment of hope and the development of interventions aimed at increasing hope. Thus, the purpose of the proposed integrative framework is to understand how uncertainty and control play a pivotal role in developing hope, which is important in the clinical setting to help patients work towards the achievement of their goals (e.g., being cured), modified them, or prevent them from falling into despair and hopelessness when their original goal cannot be achieved. Patients who are able to hope in the midst of an uncertain situation may be more likely to find effective coping mechanisms. In fact, lower levels of hope and resilience have been associated with higher levels of intolerance of uncertainty in different populations, such as parents having children with disabilities [49], suggesting that people with higher levels of hope may be more able to tolerate uncertainty.

The new model assumes that hope refers to a future good (e.g., desired goal) that may vary in certainty and the ability to control its occurrence. In Figure 1 we present a dynamic model that represents how hope always arises from an uncertain situation, and how the degree of uncertainty regarding the achievement of a specific outcome influences the external or internal resources used by the individual to achieve the goal or cope with the situation. In this sense, deciding when to engage in agentic personal control or to vest control in others (e.g., physician, bioscience, God) is necessary to maintain hope. In this model, the person-environment encounter gives rise to the potential, hoped-for goal, which is subjected to primary and secondary appraisal processes, whereby individuals establish a representation of the future goal (primary appraisal) and then assesses their capacity to achieve the desired outcome (secondary appraisal). For hope to develop, individuals must specifically appraise the situation as *uncertain*, *desirable*, *meaningful*, and to some degree *controllable*. Thus, the primary appraisal process generates a schematic conjoint representation of the hoped-for goal [50]. If the schema includes an appraisal of high control and certainty, an individual will then most likely make a secondary appraisal to engage in primary control that emphasizes personal agency, which involves environmentally-based, problem-focused strategies (agency and pathways) directed towards achieving the desired outcome [2]. In the dynamic model (Figure 1) the individual will achieve the desired goal at that point, but in other cases, upon secondary appraisal, resources and actions will be deemed to be insufficient to achieve the hoped-for goal or from the start of the process, the hoped-for goal, which may be highly uncertain, is deemed not amenable to primary control. At that point, there are two potential scenarios: the individual may give up or may reappraise the situation. When the individual gives up, a grieving process and eventual acceptance over the unfulfilled hoped-for goal might follow. However, it is also possible that the individual is not willing to relinquish the goal but feels nonetheless incapable of coping with or accepting the loss, which leads to despair and hopelessness. Finally, there is the possibility that the individual is unwilling to relinquish the goal but, in accordance with secondary control, engages in meaning-making such as benefit finding or relinquishes responsibility for the goal to someone else such as an expert health care team or a higher power such as God, the Universe, destiny, or the supernatural [51].

It is interesting to note that for persons with cancer, the process of deferring control versus assuming responsibility for control of outcomes has been associated with higher levels of quality of life and lower levels of distress [36]. This approach should not be confused with a passive stance or one of despair. This aspect of the overall hope process draws attention to the importance of the transcendent and meaning components of hope, which are very effective in helping people coping with what are objectively difficult and even dire circumstances over long periods of time. In the context of serious illnesses, hope can be manifest in vicarious secondary control, relinquish control of outcomes to a higher power, thereby relieving themselves of the responsibility for those outcomes, and in the process, achieving a sense of solace without relinquishing the goal. That is, as opposed to relinquishing control of the hoped-for goals and ceasing effort or despairing, deferring control to a higher power may be accompanied by the belief that the hoped-for goal is still achievable because effort is being expended by a higher power. In these cases, meaning making can help patients to develop hope [44][45]. Moreover, uncertainty in the context of illness has been defined as the inability to construct meaning (i.e., when a cognitive schema cannot be formed) [46], therefore, the hope process may be a catalyst for a narrative [52] that imbues meaning, which provides coherence going forward [46].

In order to delve more deeply into this process oriented model, Figure 2 anchors the dynamic model in outcomes based on four specific control/uncertainty scenarios and explicates the role of primary and secondary control. First, in high-control and low-uncertainty situations, the individual’s active behaviors may be effective in achieving the desired outcome; hence, self-efficacy and agency are highly relevant in the hope process in this situation (quadrant “a”). Second, in situations where there is high control and high uncertainty, achieving the goal is tantamount to a challenge because the individual may require more persistent active efforts to achieve the goal, which may help develop resilience but could also may lead to exhaustion. In this case, hope is vested in endurance and perseverance (quadrant “b”). Third, in situations characterized by high uncertainty and low control, the individual may come to terms with the fact that achieving the outcome does not just depend on personal effort or efficacy. Thus, secondary control strategies, such as meaning-making and letting go by accepting that someone or something “bigger” than oneself has control, may be used in the quest of hoped-for goals (quadrant “c”). Finally, there are situations in which the individual may disengage from the efforts and either accept the failure to attain the goal or fall into despair and hopelessness for not achieving what was desired (quadrant “d”).

 The proposed integrative model of hope, uncertainty, and control is by its very nature a deductive-theoretical perspective that has heuristic potential to foster research. However, qualitative research, which is inherently inductive has provided some independent and methodologically distinct convergent support for the outcome oriented focus presented in Figure 2. Eaves and colleagues [53][54] have conducted two qualitative studies in which interviews were assessed for themes of hope that emerged from the narratives [52] of persons who were coping with chronic pain conditions. An emergent themes approach revealed several distinct “modes” of hoping. *Realistic hope* is “reasonable or probable” and may be based on hope for “finding new tools” to manage illness or learning something new. If we extrapolate to behaviors within the purview of the person with illness, the hoped-for goal may be to regain strength and the pathway may be to start and exercise regimen at hospital-based program. Thus, *realistic hope* is similar to quadrant “a” (low uncertainty/high control) in Figure 2, in that it is based on a high probability of a relationship between one’s agentic behavior and the desired outcome. Another mode of hoping that emerged was *wishful hope*, which is hope in the “realm of possibility,” that is, an “active form of hope” and one requires work to “remain hopeful.” This is tantamount to the hope described in quadrant “b” (high uncertainty/high control) in Figure 2, where the desired outcome is not as probable as in quadrant “a” and requires the person to sustain effort to remain hopeful. *Technoscience hope* is hope for “unforeseeable scientific medical breakthroughs” and, as such, is uncertain and not in the person’s control similar to quadrant “c.” The same (quadrant “c”) would apply to *transcendent hope*, which may be based on faith and is embodied in the “hope that things will turn out well in the end.” Whereas the fit with the finding of Eaves and colleagues [53][54] is not perfect, the modes of hope (realistic, wishful, technoscience, transcendent) from inductive qualitative methods do provide convergence and cooraboration for the integrated hope theory.

**3.0 Practice Implications**

Given that the theory builds upon existing evidence regarding hope and appraisal models, there may be some clinical utility for the new theory for helping people with serious illness conceptualize their aspirations for recovery, coping, and adaptation. For example, the conceptual framework in Figures 1 and 2 can be used to help people discern the qualities of goals and hoped-for outcomes and suggest plans using primary and secondary control strategies in the process of moving toward those goals/outcomes. Thus, secondary control might afford patients options for maintaining hoped-for states to avoid despair and maladaptive disengagement. Moreover, even a discussion of control and uncertainty of hoped-for outcomes can help patients with discernment about what is perceived as controllable and doable and what might need to be deferred to others. In addition, this integrative hope theory may help therapists discern how to parse the aspirations of the patients they are counseling. For example, hopelessness may be countered by helping patients, who are experiencing progress of serious illness, to adopt goals that are more aligned with their sense of efficacy for achieving outcomes. Thus, goals and strategies can be transformed to foster efficacy [55], albeit diminished in form compared to when the patient was healthier or functioning more independently. In sum, because of the comprehensive nature of the proposed integrative hope theory and based on the existing evidence on the components of the theory, there is clinically utility, especially in the case of serious and progressive illness where the theory has immediate heuristic value for conceptualizing the transformation of hope.

**4.0 Research Implications**

This integrative theory of hope emphasizes uncertainty and control as key drivers of the hope process and includes relevant psychological processes, including appraisal, meaning, and transcendence. The utility of the integrated theory of hope may be tested using structural equation modeling by specifying the model that represents the structure of the theory with regards to the relationships among possible constructs [56] and to correct misspecification of relationships among constructs, which will allow to derive new hypothesis regarding how hope works and how it is related to uncertainty and control. If model-testing of the integrated theory confirms the basic flow of the processes, intervention may be based on model for use in medical settings, to help people with serious and chronic illnesses.

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**Figure 1:** *Hope process model in the context of uncertainty and control*



**Figure 2**: *An Outcome orientation matrix for hope based on uncertainty and control*

