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An Integrated Duality Theory Framework (IDTF): Marking Pathways for Consumer Decision-Making Researchers in the Hospitality and Tourism Industry

Abstract

Purpose – This paper critically reviews the underlying assumptions and theoretical conceptualizations of duality theories in general. In particular, the paper seeks to augment McCabe et al.'s (2016) reconceptualization of consumer decision making in tourism.

Additionally, the paper offers an integrated duality theory model.

Design/methodology/approach – A critical discussion of the basic assumptions, recent advances, and constructive criticism of duality theories found in the extant literature prefaces a detailed account of McCabe's et al. (2016) new general tourist choice model. The author enriches and expands the conceptualization of this model and offers an advanced dual-process theoretical framework for decision making with a broader range of variables, greater versatility, and suggestions for future research.

Findings – Findings indicate mental processes with broader external inputs (stimuli) with possible outputs (decisions/behaviors) warrant inclusion and expansion in a fulsome dual-systems model of tourist decision making.

Research limitations/implications – This research study adds to the literature of duality theories in consumer decision-making. While factors, contexts, personal preferences, and other dimensions in the tourism industry are and will continue to be fluid over time, this study offers an integrated decision-making framework which provides clear linkages that mark pathways for new developments, future research, and practitioner applications.

Originality/value – The Integrated Duality Theory Framework (IDTF) enables researchers and Destination Management Organizations (DMO) managers to acquire enhanced

explanatory and predictive value of tourism decision-making which can lead to offering improved products/services. The model's emphasis on simultaneous engagement of both heuristic and analytic dual processes reflects fundamental human nature; decision making can be "both/and" as well as "either/or" with heuristic and analytic processes.

Keywords: duality theories; mental processes; decision-making; general model; consumer behavior; tourism and hospitality

Classification: conceptual paper

Introduction

Consumer behavior scholarship has made great advances in the past four decades.

Theoreticians, researchers, and practitioners widely recognize the need for decision-making modeling that is increasingly more realistic and accurate (Ramos et al., 2021). Researchers have moved away from rational choice theories since people are not straightforward, emotionless, algorithmic computer-like decision-makers. Tourists do not simply perform complex utility maximization estimations with cold calculations (Milli et al., 2019). Scholars in social psychology (Lazarus, 1991; Triandis, 1977), consumer psychology and marketing science (Bagozzi, 1983; Zajonc and Markus, 1982) have incorporated affective and social aspects in their decision-making models (Gardner, 1985). These approaches include the ways consumers process marketing messages and other environmental stimuli, form attitudes, evaluate available purchasing choices, perform actual product purchasing, as well as offer post-purchase evaluations (Samson and Voyer, 2012).

Duality theories have emerged in the past few decades and now play a key role in behavioral sciences and individual psychology research. Duality theories from the fields of social cognition, perception, and memory facilitate an understanding of human behavior via the identification and systematic representation of higher-order cognition. However, according to Basel and Brühl (2013) as well as Thompson and Newman (2018), more expansive theoretical development and higher quality consumer decision-making modeling is needed. Tourism and hospitality scholars have recently started moving from utility maximization and rational choice theories toward more general theories of consumer behavior for explaining consumer decision-making (Le et al., 2019). These and other scholars have substantially critiqued rational choice theories for their reliance on a calculative

decision-making approach that is implemented via linear behavioral modeling (Chen and Lin, 2018; Stone, 2016).

Researchers focusing on tourist decision-making began modeling the behavior of individuals with generalized dual-process theories or various domain-specific theories in the 2010's that were emerging from consumer psychology (Jun and Holland, 2012; Jun and Vogt, 2013; Le et al., 2019). Then, McCabe et al. (2016) reconceptualized a new dual system decision-making model for tourism. Their new general model provided a more realistic and powerful modeling of tourist behaviors by incorporating key assumptions and principles of the aforementioned duality theories. McCabe et al.'s general tourist choice model is amongst the most recent and comprehensive dual process theories that focuses on different processes that shape consumer behavior. The model has been acknowledged as a major step forward for tourism marketing research (Stylos, 2020). Its scheme departs from the classic modeling approaches that originated from behavioral economics and social psychology and reflects the newest developments of social and consumer psychology. However, Fang (2021) contends the model "does not have predictive power for final decisions" (p. 7) and could be improved.

Constructive criticism of McCabe's et al. (2016) model is requisite to any continued theory validation and elaboration undertaking regarding tourist decision making. Therefore, the beneficial aspects of the model will be detailed, and its shortcomings duly noted. Then, new theoretical insights with the potential to enhance the development of a tourist choice model will be explored and discussed. Lastly, an Integrated Duality Theory Framework (IDTF) is proposed.

This study has three main objectives. First, it offers a critical discussion of the underlying assumptions, recent advances, and development of duality theories. Secondly, the discussion will then draw upon literature from cognitive sciences as well as the work by

tourism scholars including McCabe et al. (2016). In particular, the critiques offered by Evans and Stanovich (2013a) and Gawronski et al. (2014) will be highlighted. Third, this paper proposes a general duality theory for decision-making in hospitality and tourism with potentially enhanced predictive power.

The human brain: systems and relevant processes

Neurophysiologists concur that the human brain operates via multiple systems which run various unique processes (Semin et al., 2014). Similarly, cognitive, social and consumer psychology have addressed the notion of bounded rationality and place the monothetic traditional approach of rational choice analysis under close scrutiny (Kahneman, 2003; Samson and Voyer, 2012; Stanovich, 2020; Zajonc, 1980). Multiple systems are useful for commonplace sensemaking; ordinary humans in most everyday circumstances will use an array of processes that offer the best decision or choice for the situation at hand. However, this implies that individual decisions may not always be logical and rational (Stanovich, 2020) but may actually be informed by emotions and other ecological influencers.

The conceptualization of bounded rationality was influenced by the psychological processes of reasoning and is more realistic when compared to the rational choice theory (Basel and Brühl, 2013). Humans are not subjective, expectant, utility maximizers, as suggested by rational choice theorists. Instead, people follow a natural selection path which favors short-term goals and strategies, rather than long-term ones. Thus, three additional reasons help explain why the highly accurate computational brain mechanisms are not always used in decision-making. First, human evolution does not guarantee eudaimonia (state of well-being) via rationality; second, the environment we live in has changed over the course of centuries; and third, cultural evolution has been faster than biological evolution (Stanovich, 2020). Overall, the aspect of bounded rationality is consonant with the path of human

evolution and the external changes that have taken place. Individuals learn from previous decisions and adjust their cognitive abilities according to the biological and social environment, and in doing so, save computational resources and attain decision-making efficiency. New theoretical developments have emerged from the perspective of bounded rationality and reasoning mentioned above.

Notwithstanding its benefits in many cases, rational choice analysis is not satisfactory when attempting to explain individual behavior. Indeed, many decisions or actions do not always seem to serve a person's own (or best) interests (Stanovich, 2018). Also, the need for new theoretical approaches that improve our understanding of human consumption patterns and decision-making modeling via the exploration and recognition of different behavioral mechanisms is ever more apparent. Therefore, conceptual work in tandem with empirical research has taken place in the last several decades and shapes the underpinnings of a family of metatheories, called "dual-systems" or "dual process theories."

For instance, empirical evidence from neuroscience (Rizzolatti and Craighero, 2004) corroborates conceptual work on the existence of various mental processes. Implicit learning (affective processes, intuitive judgments) other than slow-learning and explicit reasoning (rationalization, hypothetical thinking) are integral according to Evans (2019). Altogether, and in a mutually enabling way, these various mental processes drive individual decision-making (Verweij et al., 2015). Consequently, scholars from around the world indicate that duality theories provide a theoretical basis that deserves closer attention in consumer behavior (Pennycook et al., 2018). In hindsight, these theories have been gradually developing ever since the first dual-process theory by Wason and Evans (1974) as an effective alternative in modeling individuals' decision-making processes in the service industries (Samson and Voyer, 2012). In order to better understand the concepts and

implementation of duality theories, a review of the relevant literature will help unravel the multiple way duality theories have thus far been implemented in hospitality and tourism.

Methodology

Empirical research methods and techniques have dominated tourism related theory-building (Le et al. 2021). Although empirical qualitative and quantitative research methodologies are extensively utilized (Closs et al. 2011), secondary research approaches can also be highly beneficial for theory development. Conceptual theory-building, for instance, can be more appropriate when holistic or/and interdisciplinary types of research questions are posed (Kock et al., 2020). Alternative ways of addressing a research problem may yield previously unconsidered dimensions and/or variables (Xin et al., 2013). One example is the desk review approach. A desk review can meaningfully clarify, modify, and/or enrich a concept or even lead to the creation of a new concept altogether (Qian et al., 2018).

The desk review of the literature for this study had three phases: keyword searches, article/literature reviews, and generation of a final database of articles. The first phase used keyword searches regarding duality theories: (a) duality theories in behavioral sciences and individual psychology, (b) duality theories in the tourism and hospitality literature, and (c) the McCabe et. al (2016) conceptual model. Specifically, keyword searches focused on these categories: '*dual theory and cognition*;' '*duality theory in tourism and hospitality*;' '*critique on dual theories of cognition*;' '*new general model of tourist decision-making*.' The searches were conducted via the *Worldcat Discovery Service*, a cloud-based library management platform which enables online access to a massive repository of university library databases and publications (Libraries.org, 2022; OCLC Developer Network, 2022).

During the second phase, articles, conference papers, and book chapters were selected for further review and analysis by weighing their relevance to the focus of this study. This

was determined with respect to their stated objectives or indications in the titles, abstracts, and keywords. The articles were categorized into each of the search categories mentioned above. A thorough content analysis of each article followed with a focus on separating out those that have either (a) offer further development of the duality theories of cognition, (b) focus primarily upon the practical use via specific models, or (c) simply make reference to this family of dual theories without substantive contributions to theory or practice. In brief, this led to an in-depth review of 84 publications discussing duality theories in individual psychology. Of special note: 23 articles published between 2011 and 2022 referred to duality theories in the field of hospitality and tourism, of which eleven were relevant to McCabe's et al.'s (2016) work and twelve articles refer to other dual process theories. McCabe's et al.'s (2016) new general model is increasingly being adopted as a theoretical framework, but so far appears as such in only three publications.

The third phase of the literature review was the production of a comprehensive database. Then a 'back-and-forth' approach of examining this literature database was employed which elicited additional sources for critical review. This extensive in-depth review led to the creation of integrated duality theoretical framework and a corollary set of research propositions which will be detailed further in this paper. Next, an overview of the emergence, evolution, and usefulness of dual systems theories is offered.

Duality theories in consumer psychology

The main purpose of duality theories is to guide research by identifying key processes that explain individual behavior. Many of these theories throughout the 1970's and 1980's drew upon general processing principles originating from cognitive psychology (Gawronski et al. 2014). They were, however, applicable almost entirely to specific content domains within social psychology or consumer psychology. Popular domain-specific duality theories

included: persuasion and attitude change, such as the Elaboration Likelihood Model (ELM) and the Heuristic-Systematic Model (HSM) (Chaiken, 1980; Petty and Cacioppo, 1986); impression formation, such as Brewer's dual-process model (Brewer, 1988) and the Continuum Model (CM) by Fiske and Neuberg (1990); attitude-behavior relations, such as the MODE model (Fazio, 1990); judgment and decision-making, such as fuzzy trace theory (Brainerd and Reyna, 2004); and, buying and consumption behavior, such as the domain-specific version of the Unified Scale to Assess Individual Differences in Intuition and Deliberation (USID) (Pachur and Spaar, 2015).

A common characteristic amongst these models is their focus on input-output relations of certain content areas (explanandum) based upon different sets of mechanisms. Heuristic and analytic reasoning, for instance, are naturally engaged by the mind to convert inputs into outputs even though these processes operate under different conditions (explanans). However, efforts continued amongst scholars towards building more integrative and generalized duality theories in the 2000's that concentrated on general principles that are independent of specific content domains.

These generalized duality theories provided blueprints of the human information processing architecture, with models that included factors referring to the type, quality, and flow dynamics of information (Oberauer, 2009). Notable examples of generalized duality theories are: (a) Epstein's (1998) cognitive-experiential self-theory (CEST); (b) Samson and Voyer's (2012) integration of persuasion-attitude change, judgment-decision-making, and buying-consumption behavior duality models in a three-stage behavioral framework; (c) Smith and DeCoster's (2000) integration of different domain-specific theories in a dual-process framework; and (d) Thompson's (2009) metacognitive framework of reasoning. These generalized duality theories combined two kinds of basic processes for human thinking

and decision-making: rapid-and-associative vs. deliberate-and-systematic (Gawronski and Creighton, 2013). This distinction between reflective vs. reflexive processing is the primary focus of the Reflective-Impulsive dual-systems Model (RIM) by Strack and Deutsch (2006) and is found in different systems and amongst relevant processes (Gawronski and Creighton, 2013).

Scholars and researchers within every field have continuously proposed changes in key terminology, conceptualizations, and explanations of the supporting mechanisms in extant theories. Proponents and critics of duality theories emphasize that any constructive critique, review, expansion, or examination should recognize that the popular terms “dual-system theory” and “dual-process theory” do not refer to an established duality theory canon or a well-formed metatheory. According to Evans and Stanovich (2013b), new constructions of models and theories are based on salient attributes and relevant correlates that are evolving and emerging, and merit renewed conceptualization and experimentation.

Typology and recent advances in duality theories of cognition

The latest advances in duality theories emerging from cognitive and social psychology and cognitive neuroscience have generated strong support as well as equally powerful criticism. Stimulating though it may be, many discussions have generated substantial ambiguity around several theoretical aspects including their typology, structure, and functionality (Ferguson et al., 2014; Melnikoff, and Bargh, 2018). In fact, vigorous debates have centered upon the number of systems, types of mental processes, attributes and correlate features that characterize the theoretical structures and views of duality theories. Dual systems/process theorists contend there is growing evidence that although heuristics are different from systematic reasoning processes, heuristics are routine brain functions that emerge from different systems yet interact with each other constantly to produce judgements and

behavioral outputs (De Neys, 2018). Thus, duality theories treat affective and intuitive processes as distinct types of cognitive processes with different defining features and correlates compared to the more deliberate processes involved in complex analytic reasoning (Basel and Brühl, 2013).

Intuition in particular has played a significant role in the formation of duality theories of cognition (Akinici and Sadler-Smith, 2012; Basel and Brühl, 2013). The concept of intuition has distinctive characteristics and definitions. For instance, ‘intuition-as-expertise’ stresses its experiential aspect (Salas et al., 2010) and ‘affectively charged judgments’ according to Dane et al. (2012) stress the affective component of intuition. Some scholars have proposed a logical type of intuition rooted in logic-based principles and probabilistic associations that are based on semantic and visual/spatial mental associations (De Neys, 2018) that complement and even compete with heuristic-based intuition. Similarly, Sloman (2014) proposed that intuition is not simply an associative dimension but actually imposes causal structures by building on patterns emerging from various stimuli and events. In this manner, intuition engages causality to explain deviations from normality. Furthermore, human mental architecture is based on analytic or deliberate thought processes that enfold intuition (Young, 2016). The main functions that blend mental processes are those that can rationalize and connect intuition with hypothetical thinking and mental simulations (Evans, 2010 and 2019). The overall aim is to provide effective reasoning that enables an individual to draw conclusions and make optimal decisions (Evans and Stanovich, 2013a).

In summary, after decades-long debates about the characteristics and dynamics of mental activity/processes, a recent consensus has emerged around two types: Type 1 are those that assert *intuition* is autonomous, and Type 2 of *deliberation* assert a requisite, minimum amount of memory for mental activity/processes to occur (Thompson, 2018). Thus,

“autonomous” and “working-memory load” are currently the most salient, defining features of fundamental mental processes. Other qualities mentioned in the literature (related to consciousness, intentionality, efficiency, controllability) are corollaries between/within Type 1 and 2 processes but are not sufficiently distinctive to stand-alone (Pennycook et al., 2018). Additionally, another ongoing debate regards the number of systems related to those two types as well as associated qualities. Scholars suggest there may be only one supra-system managing various mental processes, but consensus has been elusive thus far (Keren and Schul, 2009; Mugg, 2018). Perhaps, as suggested by Bellini-Leite and Frankish (2020) and Kahneman (2011), there are exactly two separate systems running processes of each type mentioned above, or even multiple systems managing respective process types or even multiple processes altogether (Milli et al., 2019).

Regarding the dual-process models, there are primarily three different configurations regarding their structure. They are the serial (or default-interventionist), the parallel, and the hybrid. The default-interventionist model follows a linear, serial view on the interaction between Type 1 and Type 2 processes and assumes that Type 2 processes would be activated after Type 1 (Evans, 2006 and 2019; Evans and Stanovich, 2013a; Kahneman, 2011). Alternatively, the parallel model assumes that both types of processes can be activated simultaneously at the start of the reasoning process, but activation of Type 2 processes does not necessarily suggest they will be successfully completed, but only available if needed (Thompson, 2013). The third option, the hybrid model (De Neys, 2018) proposes two types of intuitive responses based on basic logical and probabilistic principles: the standard ‘heuristic’ intuitive response and the ‘logical’ intuitive response. The key difference between the hybrid model and the serial and parallel models is that the hybrid model contends that some form of logical response can be produced by Type 1 processes with the potentiality of a more elaborative analytic response that might be rendered if Type 2 processes are also

triggered. Thus, in different situations the proponents of the hybrid model assert that rational decision-making is not exclusively driven by Type 2 processes but may emerge via Type 1 processes.

Points of criticism and new insights

Experiments in cognitive neuroscience have increasingly revealed multiple, parallel loops of neuronal networks that interact in the brain. These systems of loops and networks govern intuition and deliberation as well as other functions (Lieberman, 2007; Sloman, 2014). There is sufficient evidence according to Basel and Brühl (2013) of distinct neural bases for running various mental processes, but not necessarily that there are only two discrete systems with separate and fixed brain architecture.

This significant insight that mental processes are associated with different systems was well articulated by Grayot (2020) and Mugg (2018). Overall, empirical research in social cognitive neuroscience has shown that distinguishing between various and interwoven mental processes makes sense. Therefore, theory-building on the basis of different systems that capture various spaces or areas in the brain is warranted. Are there only two mental systems running all mental processes that operate fluidly, in collaboration or synergistically to create a decision-making outcome? This is a legitimate theoretical question (Ferguson et al. 2018). Preeminent scholars such as Evans and Stanovich (2013a) and Evans (2019) have stopped referring to ‘dual-system’ theories, but to ‘dual-process’ theories. Thus, in this study, a crisp distinction between ‘System 1’ and ‘System 2’ is not presupposed. Nonetheless, relevant aspects of this issue deserve further discussion.

A related issue is querying “why” has there been a strict dichotomy as suggested in the published literature between Type 2 and Type 1 mental processes in terms of their properties and types of decisions they address? Simplistically pitting rational vs. intuitive decision-

making is not reasonable given the sophistication of the human mind and the infinite number of real-life circumstances. Theoretical propositions and empirical evidence have recently loosened the absolute distinction of the processes themselves (Grayot, 2020). Thompson (2013), for example, postulated certain cases/situations where Type 2 processes occur automatically by an unusual or surprising situation in the environment or by a metacognitive feeling of discomfort. Similarly, Type 2 processes may be engaged or hindered in response to a metacognitive feeling of rightness based on an implicit feeling of fluency or familiarity (Thompson, 2009; Wang and Thompson, 2019). Therefore, not only Type 1, but also Type 2 processes may be engaged autonomously in response to appropriate stimuli. The key difference is that Type 1 processes are activated and run to completion in response to specific triggering stimuli. On the other hand, Type 2 processes may run (or not) to completion depending on time availability and/or working memory capacity (Thompson, 2013).

Changing gradually and flexibly between systems and relevant processes is not an indication of human irrationality or weakness in decision-making. The changes between systems/processes reflect a balanced, if not optimum, use of the finite cognitive resources of the brain. Thompson (2013) concurs and posits that some Type 1 processes demonstrate flexible cognitive control that can lead to some rapid logical decisions. Also, recent theoretical work provides normative justification that heuristics are qualitatively consistent with the rational use of limited cognitive resources (Lieder et al., 2018) as an organic maximizer of the brain. According to Milli et al. (2019) the combination of rapid and imperfect (Type 1) cognitive processes with slower but accurate (Type 2) cognitive processes may actually be the best possible solution. Furthermore, Milli et al. (2019) confirmed previous findings that brain structures prompt rational cognitive abilities and considerations of personal relevance and time availability which may optimize the decision-making process (Samson and Voyer, 2012). This is also found in the work by Thompson and Newman (2018)

who recognize that although mental routines may be classified as intuitive and deliberate with different processing rates and varying amount of effort, they do not run sequentially but concurrently as they are in continuous interaction with each other.

An outstanding challenge remains - what is the predictive ability and explanatory value of duality theories/frameworks and dual-system explanations? It has been postulated that they are good, but in highly controlled settings (Grayot, 2020). In other words, systems-based propositions of duality theories place emphasis on testing individuals' abilities to solve problems and complete tasks under fully controlled conditions. However, experimental evidence in real-life, with the inclusion of distinct effects and reasoning errors to systems, do not necessarily provide satisfactory assessments of individual decision-making abilities. They may not lead to reliable conclusions about human decision-making (Mega et al., 2015).

The above critical discussion points represent part of a broader critique of the prevalent view/adoption of duality theories for explicating systems and mental processes. Rational decision-making (cognition) cannot be assigned to the operations of a single system, or in this instance, a single type. Type 2 processes cannot be exclusively guaranteed to lead to rational decision-making, and similarly, Type 1 processes do not necessarily produce automatic actions. Also, the popular assumption amongst behavioral theories that cognition and emotion should be treated as independent functions contrasts with recent evidence from cognitive neuroscience. These functions are integrated by the brain via neuronal networks and usually unfold in joint action (Verweij et al., 2015). Complex brain structures and relevant processes drive human decision-making. Even though there have been notable advances in cognitive neuroscience (Gawronski et al., 2014; Young, 2016), requisite mechanisms/mental processes have not been fully clarified. Consequently, theory-building of duality theories still has long

way to go towards a coalescence of the research contributions emerging from cognitive and social psychology and cognitive neuroscience.

The McCabe et al. (2016) new general model and other duality models in consumer decision-making in tourism and hospitality

Various proposed duality conceptualizations have been implemented and are found in the tourism marketing literature. Some are domain-specific, such as ELM (Jun and Holland, 2012) and the consumer analytic vs. imagery framework (Le et al. 2019). Others are generalized theories, such as the interactive parallel dual-process framework (Jun and Vogt, 2013), and the new general model by McCabe et al., (2016). (See Table 1).

Table 1. Review of published research on duality theories in hospitality and tourism.

| Author(s) Year | Description | Methodology | Main Outputs/contributions | Future Directions |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| Jun and Holland (2012) | Investigated information-processing strategies, and the moderating effects of two process modes and involvement in traveler decision-making via ELM | Full factorial experimental design with 317 students. Data manipulation with one-way ANOVA and hypothesis testing via three-way ANOVA | Tourists use specific information attributes (text argument quality, picture attractiveness) in different (high/low) involvement situations | Adopt new information-processing behaviors conceptualization, and experimental research methods |
| Jun and Vogt (2013) | The Heuristic-Systematic Model is employed to substantiate the proposed interactive dual-process model | Factorial experimental design to measure various effects of independent variables, employing 291 student responses. Data manipulation with one-way ANOVA; hypothesis testing via three-way ANOVA | Independent and interdependent effects on effortless processing mode. Due to the presence of interdependent effects in high involvement, the moderating role of involvement (dichotomous ELM approach) was not supported | Contribute to experimental research methods utilized in duality theories for adoption in travel and tourism research |

| | | | | |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Filieri et al. (2018) | Investigated consumer perceptions about information helpfulness (IH) in electronic word-of-mouth contexts by utilizing dual process theory | An online survey of 570 usable cases; hypothesis testing conducted via CB-SEM | Informational and normative influences were often found together on consumer perceptions of IH in tourism services emerging from third-party e-tailers publishing consumer reviews | Future studies to test the influence of website trust, and tie strength on the constructs used in the proposed model |
| Chen and Lin (2018) | Examined the role of 'perceived fashionability' in forming user e-tourism website stickiness | Online survey to test conceptual model by employing PLS-SEM on 376 cases | Drawing on dual-system theories, it expanded knowledge of the major drivers of e-tourism website stickiness | Future studies to apply dual-system theories to other e-consumer behaviors, such as interaction between users and websites |
| Le et al. (2019) | A general framework based on dual-system mental processing (i.e., rational and imagery) approach was proposed to understand tourist experience and behavior | Content analysis of 70 papers via Leximancer | Dual mental processes mediate how experiential stimuli influence tourist behavior; imagery processing is superior. | Future development of measurement scales for tourist imagery processing |
| Kim and Petrick (2021) | Sought verification of an ELM for the role of dual-route persuasive communications within a tourism crowdfunding context | An online survey of 417 usable responses were analyzed via PLS-SEM to test the proposed model | Verified ELM applicability in tourism-related crowdfunding settings, comparing the central and peripheral cues | Future studies to apply qualitative methods and big data analytics. Also, emotional constructs to model goal-directed behavior (instead of ELM) |
| Shi et al. (2021) | Investigated how systematic and heuristic cues influence tourists' cognitive and emotional trust, and intention to adopt artificial intelligence-based recommendation systems in planning trips | A two-study approach was taken. The first one tested a model via hypothetical scenario method, and 364 responses were analyzed using PLS-SEM. The second one involved two phases: a qualitative study via focus group, and a lab experiment with 184 participants | Investigated the impacts of travelers' cognitive assessments and affective evaluations utilizing the trust centered HSM. The joint effects of both systematic and heuristic evaluations on trust development and adoption intentions, were examined | Future studies to expand our understanding of the boundary conditions that impact travelers' evaluations with AI-based recommendation systems |
| Dai et al. (2022) | Introduced travel inspiration as a motivational state to provide a potential shortcut | Conceptual approach based on desk review | Based on dual-process theories, tourists may rely on affective intuitions as mental shortcuts to simplify the rational decision | Future studies to propose and test a measurement scale as the basis for further empirical |

in tourist decision-
making

process, due to the
information overload,
and time/costs
constraints

research on travel
inspiration
through a dual
theoretical lens

McCabe et al. (2016) sought a better understanding of the mechanisms/mental processes (*explanans*) involved in tourism destination selection, as well as to incorporate theoretical construct representations (*explanandum*) in their proposed decision-making model. Their model primarily concentrates on the basic architecture and flow of information processing and illuminates the dynamics, level of involvement, and cognitive overload/intensity of a dual system that unfolds between either intuitive processes (System 1) or rational reasoning (System 2). McCabe et al., (2016) stated, “Either system 1 or 2 may be engaged A tourist may apply the analytic or heuristic system at each stage of decision making.” (p. 9)

McCabe et al. combined the ELM dichotomous approach up to the *information search* stage with a default-interventionist sequential (serial) mental processing in the *complex evaluation* and *destination selection* stages. They proposed that certain individual and contextual factors (level of involvement, cognitive load, inertia, time poverty) play the role of ‘interchange nodes’ between Systems 1 and 2 to run either heuristic (Type 1) or analytic (Type 2) processes, respectively. These interchange nodes signify which system is prioritized and activated when a consumer engages in decision-making, and/or whether a system change would follow depending on specific factor loadings, as per Jun and Holland (2012).

According to McCabe et al.’s reconceptualization, the destination choice process is controlled by either system depending on the tourist’s level of involvement. A tourist can select directly via System 1, or via the information search stage, and the complex evaluation

stage via System 2. Yet, a decision maker may turn to System 1 before the complex evaluation stage if the cognitive load is overwhelmingly high. A widely recognized strong point of this model is its inclusion of logical heuristics as part of System 1 processes that are based on recognition/familiarity and social factors, in addition to affect-driven heuristics.

These logical heuristics are further analyzed to specify certain tourism decision situations that would trigger distinct types of System 1 heuristics rather than via System 2 analytic processes due to certain individual or external factors before culminating in a decision. Also, McCabe et al.'s new general model suggests that additional factors may influence the utilization of different mental systems. For instance, requirement for accuracy and effort, tendency for minimizing negative emotion, and justifying decisions are encapsulated within their framework. The model also included additional factors thought to play a moderating role at various stages of the decision-making process such as demographic factors, cognitive abilities, faith in intuition, and personal relevance, as identified in the extant literature.

To date, at least eleven published papers refer to McCabe et al.'s (2016) dual-system tourist behavior framework (Le et al., 2020; Li et al., 2021; Mayer et al., 2020; Mirehie et al., 2021). Thai and Yuksel (2017) offer the most explicit links to the model, while three research studies employed the model as either a theoretical underpinning or overarching framework in their empirical investigations. Table 2 provides details of the articles that adopted McCabe et al.'s (2016) model with short descriptions, methodologies, and main outputs/contributions to consumer behavior in hospitality and tourism.

Table 2. Review of published research adopting McCabe's et al. (2016) general model (source: authors).

| Author(s), publication year | Description | Methodology | Main outputs/contributions | Future Directions |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Liu et al. (2019) | Proposed a model to test the influences of a set of attributes on consumers' perceived experience value via impressions and perceived utility by activating the McCabe's general model intuitive and rational types of decision-making | A semi-structured interview scheme with 29 respondents to inform the survey questionnaire design. 584 valid responses were analyzed using covariance-based structural equation modeling | Consumers that use a heuristic approach and focus more on impressive moments may find monetary cost less important than consumers who follow a normative approach | Future studies to explore factors that could initiate diverse types of processing, i.e., heuristic, and analytic processes. |
| Karl et al. (2020) | Proposed and tested models by focusing on differences between vacations with varying lengths of stay. It follows McCabe's general model combination of systematic with heuristic-driven decision-making. | Structured questionnaire survey led to 7798 in-depth interviews. Three regression models were employed with models based on the same set of independent variables, but various dependent ones | Consumers use systematic decision-making processes for travel decisions with high personal relevance and low frequency, e.g., booking long-haul trips; however, they may use heuristic-driven decision-making involving more intuitive processes, e.g., visiting friends & family | Future studies to include various individuals / agents influencing decision-making. To check generalization of outputs with respect to culture and distinct market characteristics |
| Fang (2021) | Adopts McCabe's general model information processing systems structure, and cognitive load as key decision-making factor | Conceptual and thorough desk review approach on tourist behavioral modelling | Proposes a new holistic framework by combining McCabe's general model, behavioral and choice-set models. It introduces two new variables: decision-making threshold and information loop limit. | Research on how various factors influence the knowledge of alternatives that could lead to more realistic modelling and higher explanatory power. |

Critical discussion of McCabe et al.'s (2016) new general model of tourism decision-making

McCabe et al.'s (2016) introduction of a new dual-system model for tourist decision making was in response to weaknesses noted in previous decision-making theoretical models.

Generally speaking, the new conceptual model placed greater emphasis on mental processes rather than inputs-outputs in consumer decision-making. Albeit making a significant

theoretical contribution, McCabe's et al., (2016) remarked, "Different approaches are [still] needed to help academics and practitioners develop new knowledge and progress ideas and methods about how tourists make decisions amongst the multitude of possible strategies" (p. 11). Critical issues with respect to key underlying assumptions, as well as specific drawbacks and limitations of their new general model will be discussed further.

McCabe et al. make two claims about dual-system approaches: first, they argue that "the existence and use of the dual-system has been proved by empirical studies" (p. 7), and second, that dual-system approaches have been overlooked in tourism decision-making literature. There are two issues regarding the first claim. First, the use of the term 'dual-system' has been abandoned by the majority of theorists in the cognition field as it implies that only two systems are responsible for all mental processes. Second, the existence of a dual-system has not been solidly verified (De Neys, 2021; Mugg, 2018). A legitimate claim, that is based on evidence from neuroscientific experiments, is the existence of several different mental processes may be classified as two broad types: intuitive processes and analytic processes (Verweij et al., 2015). Concerning the second claim, it is accurate to say that duality theories have not become popular in the tourism and hospitality literature despite some notable publications released in the last few years (Chen and Lin, 2018; Jun and Vogt, 2013; Le et al., 2019).

Another point raised by McCabe et al. (2016) is that "most models in tourism studies analyze the decision-making process as an input-output process" (p. 7). Nevertheless, in order for generalized dual process theories to be put to practical use (empirical research), input (stimuli) and output variables still needed. Solely examining the type of mental processes that govern decision-making can only partially help consumer behavior research (Gawronski et al., 2014). Researchers and managers would be hampered in trying to produce practical

managerial tactics and strategies without incorporating theoretical construct representations of decision-making.

According to McCabe et al., (2016), the existing general models of consumer behavior in tourism do not distinguish among the difference phases of tourism decisions. True, although most behavioral models that have been empirically tested do not recognize various decision-making stages, both Schmoll (1977) and Moutinho (1987) have done so. These scholars recognized and included separate phases in their proposed general frameworks decades ago. Although preference for testing single-phased models have endured, the fact that multi-phase models are not widely popular is a separate issue that does not necessarily mean there has been a lack of available multi-phased theories and frameworks. Next, there are four key issues of McCabe et al.'s new conceptualization that limit its theoretical and practical value.

First, McCabe and colleagues claim their new framework overcomes the rationalist approach inherent in the cognitive and behavioral models of consumer decision-making in tourism and hospitality prevalent at that time. The affective and logical intuitive mental processes are better established in their new general model. However, the affective dimension relating to emotions is not clearly detailed or explained. While there is a detailed account in McCabe et al. (2016) of logical intuitive processes (partially comprising heuristics) and their underlying factors driving consumer decision-making in a tourism context, the affective processes are not fully discussed. Only a few generic references, such as negative emotion avoidance, are provided in their model's depiction. Notwithstanding having identified the role of affect in their literature review and conceptualization, McCabe et al., (2016) did not fully explicate this dimension in their proposed framework.

Second, according to Jun and Vogt, (2013), predictive power is significantly reduced due to highly-involved individuals' tendency to use all available information from both processing modalities which is evidenced in studies that used dichotomous dual-processing. However, this is not addressed by McCabe et al. The main contribution of the new general model is the distinction of two different systems regarding the functional dimension of decision-making. Indeed, the model offers a clear distinction between heuristic and analytic processes in the human brain. However, two factors, namely level of involvement, and cognitive load, still dominate the decision-making choice in their new general model. Thus, the pitfalls of previous cognitive and behavioral models persist with heavy dependence on complex reasoning, rationality, and logic-driven processes.

Third, while McCabe et al., (2016) have received wide support, their model provides a functionalist approach of the mental processes that drive individuals' tourist decision making. That is, the mechanisms of decision-making in the model closely align with functionalist approaches more so than the factors that produce the decisions. The new general model refers to mental processing and the etiology of choice phenomena, rather than focusing on the psychology of choice phenomena. In other words, the model is a blueprint/snapshot of tourist decision-making with two dynamic systems (heuristic and analytic) but is not amenable to testing as input and output variables are missing.

Fourth, McCabe et al. admit that their model focuses on only one aspect of tourist decision making - destination choice. Indeed, other relevant decisions such as choice of transport mode, choice of tourism activities, and hospitality accommodations would be of high interest to researchers and practitioners alike. These are indispensable relevant corollary decisions that should not be regarded as 'separate from', but 'integral to' the destination choice itself. Each can be highly influential upon the intuitive and/or analytic loops of the

destination selection process (Grigolon et al., 2012; Juschten et al., 2021). Simply stated, the interactions between these corollary decisions might make a substantial difference to the final destination choice (Garcia et al., 2015).

The following propositions for an integrated decision-making model with an emphasis on the simultaneity of dual processes more so than either-or is offered along with a set of clearly delineated research tracks. This contemporary approach in consumer decision-making can lead to key theoretical progress and enhancement of marketing strategies to the benefit of the academic and business communities.

Research propositions and the new Integrated Duality Theory Framework (IDTF)

The following set of propositions stem from a synthesis of the previous discussion points:

P1: Duality theoretical models may represent multiple dual processes of distinct types, which depend on situational and contextual factors that require time to complete as well as working memory capacity; multiple processes may be operationalized at various stages of consumer decision-making.

P2: Both logical and affective intuitive mental processes must be included in a general theoretical duality model to represent the role of intuition more accurately in consumer decision-making.

P3: A duality theory should offer a representation of the architecture of information processing and the input-output relations of relevant variables to reflect both the etiology and psychology of choice phenomena more fully. Doing so, offers a testable hypothetical framework or model.

P4: General tourist decision-making driven by duality theories needs to include a network model structure to cover a range of related sub-decisions (transportation

mode, accommodation, and on-site tourism activities) that may impact final destination selection.

Considering the first three propositions stated above, a new integrated consumer behavioral duality theory is proposed in Figure 1 called Integrated Duality Theory Framework (IDTF). The IDTF responds to Kim and Petrick's (2021) call for a new, dual process framework. The IDTF operationalizes the first three propositions by illustrating the processes related to both the etiology and psychology of phenomena involved in consumer decision-making. In Figure 1, the psychology-related constructs appear in black font and the underlying process/etiology-related concepts appear in brown font. Three behavioral constructs depicted in Figure 1 are the main pillars of the decision-making process: stimuli, consumer predispositions, and consumer behaviors. Deliberation and Intuition are depicted as operating in tandem, because both process types work together with the support of biological substratum (Talat et al., 2007).

The two mental sub-processes of deliberation and intuition function in a combined, interwoven manner throughout the entire decision-making process to help create optimal responses/choices. Heuristic or analytic mental routines drive a particular decision process regardless of the initiating priority was triggered by a heuristic or analytic engagement. For example, if heuristic outputs are dominant at the outset, then the Feeling of Rightness and Metacognitive Beliefs will be primarily engaged and used to check processes. Similarly, if analytic outputs are prevalent at the outset due to a less compelling heuristic response, then a set of choices will be primarily evaluated via Judgement of Solvability (Thompson, 2009). The prioritization of mental processes may change in the next stage depending on the relative processing fluency, the working memory loads, the available time to complete tasks and/or the levels of confidence to manage information of varied complexity. Suggestions for latent

or observed variables that further specify the content of these general theoretical constructs appear in Table 3.

The IDTF is testable and the influences on destination selection can be measured when researchers array a best-fit selection amongst numerous variables. Any proposed set of variables by researchers will include a mixture of heuristic and systematic processes that possibly influence tourist decisions and/or behaviors. Multilayered travel decision-making sets with interdependent elements in response to proposition *P4* are shown in Figure 2. This includes various parallel sub-decisions that may occur simultaneously and are interconnected during the selection process (Dellaert et al., 2014; Garcia et al., 2015). As Karl and Reintinger (2016) posit, network analysis may be most appropriate for investigating a variety of individual choices influenced by the causal links among the variables involved in interdependent decision tasks as depicted in Figure 2. Cross-layer effects are an on-going occurrence according to Dellaert et al. (2014) that occur from the sub-decision tasks on the main destination selection and vice versa.

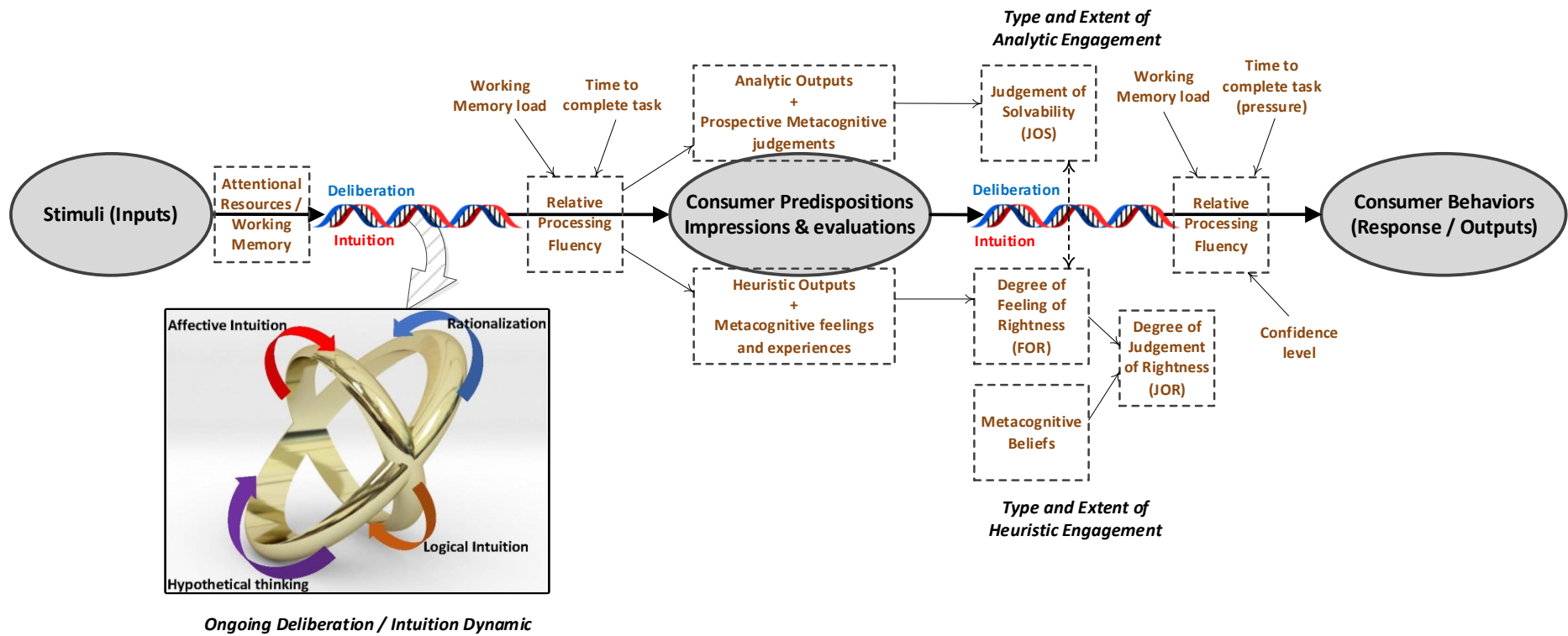


Figure 1. Integrated Duality Theory Framework (IDTF).

Table 3. Example variables to specify IDTF constructs (Sources: Loureiro et al., 2021; Kim and Petrick, 2021).

| Stimuli (inputs) | Consumer predispositions | Consumer behaviors (response/outputs) |
|-----------------------------------------------------------------|-----------------------------------------------------------------|-------------------------------------------------|
| Natural environmental characteristics | Perceptions of relationships with destinations | Destination selection |
| Architectural landmark buildings | Perceived cohesion and intimacy | Accommodation choices/bookings |
| Destination events and cultural elements | Consciousness of tourism moment | Transport mode choices/bookings |
| Surrounding atmosphere | Perceptions of accommodation offerings | Cultural events and monuments bookings |
| Outdoor decorations | Perceptions of transportation modes | Tourism activity choices |
| Destination media publicity and communications | Emotional arousal, pleasure, dominance | Sightseeing tours bookings |
| Marketing driven by organizations (hotels, airlines, DMOs etc.) | Attachment, willingness to engage | Gastronomy tourism choices, restaurant bookings |
| Destination reputation | Satisfaction | Re-visits, re-purchases, loyalty |
| Availability of high-tech apps | Trust (cognitive, emotional) | |
| | Perceived experience (prior/current) of accommodation offerings | |
| | Perceived experience (prior/current) of transportation modes | |

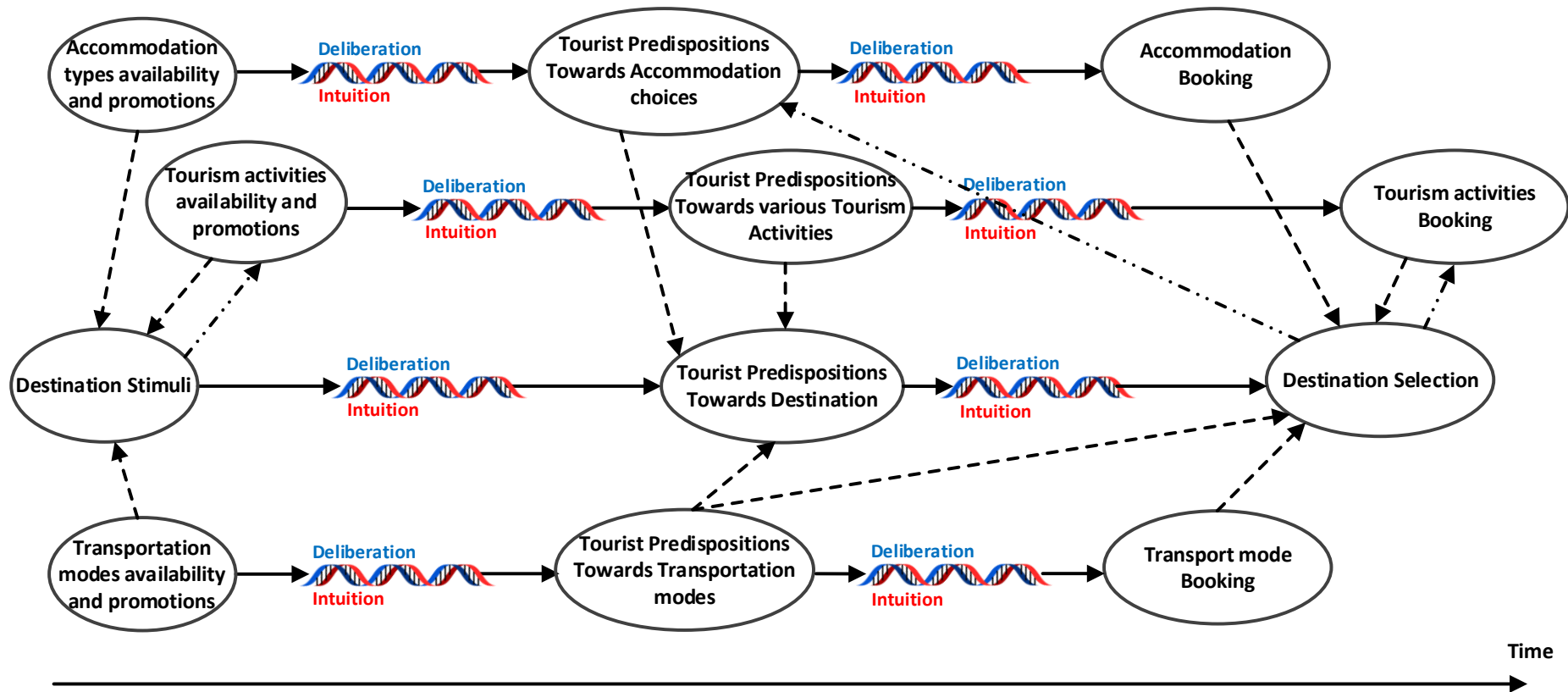


Figure 2. Example of a network structure of multiple sub-decisions related to the complex problem of destination selection.

Conclusions, contributions, and research implications

As Gawronski et al. (2014) pointed out, generalized dual-process theories are formulated in a way that is difficult to examine specific relations between external stimuli and behavioral responses. Indeed, it has been difficult for researchers and practitioners to assess if any improved outcomes or predictive power have emerged amongst the different dual process from behavioral economics and social psychology. The evolution from functionalistic dual-process models to more testable models might indicate whether duality theories warrant continued theory-building or provide a dependable new means for investigation of consumer behavior and individual decision-making.

The predictability of McCabe et al.'s model has not been empirically evaluated and compared on the same basis with other models that have emerged from social and consumer psychology. As mentioned by McCabe et al., (2016) in their concluding remarks, the identification of influential factors and the empirical examination of their interrelationships are key in order to determine which kinds of mental processes would be activated in different consumer decision-making contexts. The new general model is a broad framework and beneficial first step towards a more advanced general theory of consumer decision-making in hospitality and tourism. Gawronski et al. (2014), however, recommend that new theories should be falsifiable in support of their predictive worthiness.

This paper critically discussed the valuable role of generalized duality theories in the study of consumer decision-making in a hospitality and tourism context. The paper contributes to the scholarship of duality theories in at least four ways.

First, it provides a detailed account of duality theories with respect to the distinct types, structures, and functionality of cognitive processes. The paper draws upon behavioral

sciences research to highlight key underlying assumptions and shortcomings of the duality theory building process. Subsequently, the paper contends the concurrent interplay between intuitive and deliberate processes indicates an optimum use of mental capacity vis-a-vis decision-making that is indispensable when conceptualizing new duality theories. Second, an in-depth scrutiny was undertaken of McCabe et al.'s (2016) new conceptual model with emphasis on its assumptions, structure, and explanatory and predictive value of the model. Strengths and weaknesses were noted as well as the opportunity for improvements was discussed. Third, the crafting of a set of testable propositions and creation of a generalized duality theoretical framework for consumer decision-making in hospitality and tourism was the outcome of the critical discussion and synthesis of the extant literature and McCabe et al.'s (2016) model. Furthermore, a wide array of previously under-considered variables was identified and offered in this paper for future researchers and theory-builders. This contribution explicitly offers a means for creating testable theoretical models and pathways for researchers. Fourth, this study suggested a holistic view of individual decision-making in tourism (See Figure 2). The IDTF framework depicts an inseparable, interconnectivity that is sometimes balanced, but perhaps most times not, of dual processes. The interminable interplay of deliberation-and-intuition underscores the need for modeling on the basis of various concurrent decision-making points along many parallel, interdependent, sub-decision tasks. A dual system need not be an "either/or" choice but perhaps more reflective of human processing when be considered as "both/and".

Overall, the paper improves our understanding of theory-building as well as the individual decision-making mechanisms and phenomena in a more holistic manner. Consumer behavior scholarship in tourism (Stylos et al., 2021) and marketing, can clarify certain aspects of consumer decision-making research with the utilization of duality theories. In the sphere of operations, the proposed IDTF can help Destination Management

Organization (DMO) managers formulate segmentation and targeting strategies in their selected tourism markets. Marketers can better position tourism destination and hospitality-related offerings that may depend on a variety of trip-related sub-decisions unique to different situations and locales (Pappas and Glyptou, 2021).

Limitations and future research

This paper reviewed the latest advances in dual systems theory and specifically evaluated the new general model of tourism decision-making by McCabe et al., (2016) as the most relevant to this study's overarching purpose. Even though a nearly exhaustive literature review addressed the most well-established dual-systems theory scholarship up-to-date, future researchers should build on this review as well as critically examine the proposed IDTF. The ongoing evolution of the tourism industry in an era of rapid and dynamic technological and societal shifts calls upon the next generation of consumer decision-making researchers and theoreticians to create ever more predictive models in hospitality and tourism.

The IDTF concentrates on the various interacting/blended, concurrent flows of dual processes; the simultaneity of dual-systems is a fundamental assumption of the model. However, affective, logical intuitive and rational aspects included in the IDTF need to be empirically investigated to cover an ever-widening array of aspects and sources of individual decision-making such as those shown in Table 3. This might include applying simulated data or analyzing primary data to empirically validate or debunk the IDTF. Additional antecedents and output variables can also be investigated and potentially integrated into the IDTF to reflect the content and various contexts of decision-making. Various testable versions of the proposed framework await future researchers and practitioners. Finally, the role of other agents of decision-making could be considered, such as virtual assistants and humanoid

robots in mediating decisions but also in shaping those decisions in synchronicity alongside human mental processes, as mentioned by Buhalis et al. (2019) and Stylos (2020).

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