

Beyond accessibility: empowering mobility-impaired customers with motivation differentiation

Beyond
accessibility

3503

Ye Zhang
Florida Atlantic University

Jie Gao
*Department of Hospitality,
Tourism and Event Management at San Jose State University*

Shu Tian Cole
Indiana University Bloomington, Indiana, USA, and

Peter Ricci
Florida Atlantic University

Received 17 August 2018
Revised 31 March 2019
Accepted 19 May 2019

Abstract

Purpose – To sufficiently fulfill the travel potential of people with mobility impairments (PwMIs), this study aims to propose a valuable supplement to facility/service accommodation by hospitality/tourism businesses by identifying and purposefully cultivating the superior motivation types for empowering PwMI's travel pursuits despite challenges. To this end, the study proposes a self-determined versus controlled motivation subdivision to the predominant travel motivation typologies, with its practical value, theoretical value and application feasibility verified.

Design/methodology/approach – To ensure the verification reliability across challenge travels, the study adopts an extreme groups design for data collection. Qualtrics surveys situated in two resort-package scenarios contrast in facility/service accommodation levels are paired with two US PwMI groups contrast in travel capabilities. An unconventional mix of analytical information and seemingly unrelated regressions are adopted for data analyses.

Findings – Self-determined motivations are found as the superior facilitators of PwMI's challenging resort-travel pursuits, confirming the practical value of the proposed motivation subdivision. The theoretical value is verified given the subdivision's significant explanatory power for resort-travel attitude and behavioral intentions, after controlling for travel purpose fulfillment. It is also feasible to achieve the targeted cultivation of self-determined motivations by supporting the basic physiological needs of autonomy, competence and relatedness.

Practical implications – The study's context-based findings on the effective motivational mechanisms for PwMI can guide hospitality/tourism businesses to improve PwMI-targeted marketing effectiveness and efficiency.

Originality/value – Key theoretical contributions include expanding the explanatory power of travel motivation typologies, enhanced integration of self-determination theory into travel motivation conceptualization and more accurate reflection of the widespread presence of social factors in travel motivations.

Keywords Motivation, Disabilities, Resorts, Self-determination theory, Effects comparison, Seemingly unrelated regression

Paper type Research paper



1. Introduction

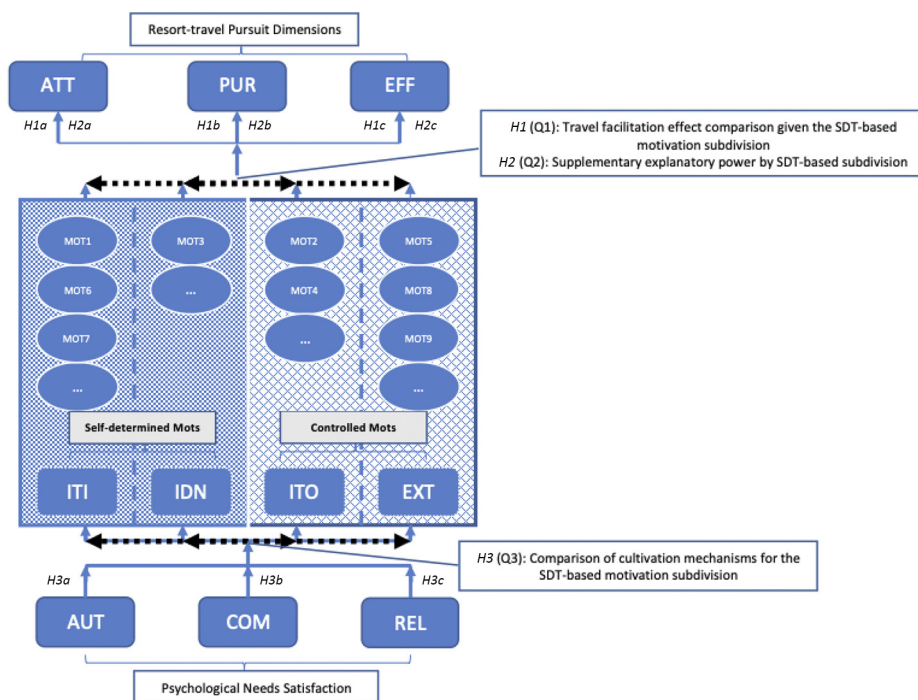
People with mobility impairments (PwMIs) is a fast-growing yet largely underrated travel market for hospitality/tourism businesses. In the USA alone, about 6.89 million adults are

mobility impaired (U.S. Department of Health and Human Services, 2015), categorized as using aids such as wheelchairs or crutches because of their inability to walk, grasp or lift objects (NANDA International, 2012). They took 40 million trips annually in the USA and spent US\$17.3bn on travel (Open Doors Organization, 2015). This market potential is multiplied considering PwMI typically travel with companions and the elderly population, as 27 per cent of people aged 65 and above in the USA are mobility challenged, whereas over 22 per cent globally will be over 65 years old by 2050 (World Health Statistics, 2016).

Challenges inhibiting PwMI's travel pursuits are threefold: intrapersonal (e.g. low interest or self-confidence), structural (e.g. inaccessible facilities and unreliable services) and interpersonal (discouraging social environment and unavailability of assisting travel companions) (McKercher and Darcy, 2018). Hospitality/tourism businesses have been gradually improving their facility accessibilities and service levels to alleviate structural challenges for PwMI to tap into this valuable market and fulfill corporate social responsibilities (Lin *et al.*, 2019). In 2015, 72 per cent of disabled travelers encountered major obstacles with airlines and 65 per cent with airports, down from 84 and 82 per cent, respectively, in 2005 (Open Doors Organization, 2015). Despite progress, mobility-impaired traveler percentages are steady (Open Doors Organization, 2015), whereas the travel potential of PwMI is insufficiently fulfilled (Anand and Ben-Shalom, 2014). The lack of sensitive market responses and costly accessibility investments largely explain the hospitality/tourism businesses' reactive than proactive attitude in accommodating PwMI and largely baseline ADA compliance.

Tourism/hospitality researchers (Nyman *et al.*, 2018; Chikuta *et al.*, 2018) and practitioners (Lyu, 2017) have focused on removing structural challenges to increase PwMI's travel pursuits; yet, this is insufficient primarily because of persistent intrapersonal challenges. Some PwMI may see limited value in leisure travel because of its hassles/risks, or previous travel failures and subsequent lack of self-confidence, thus favoring less demanding leisure activities (Yau *et al.*, 2004; McKercher and Darcy, 2018). To encourage hospitality/tourism businesses to go above and beyond current efforts and proactively accommodate PwMI, and as a premise for accessibility/service accommodations to be effective, motivating mechanisms with potential for boosting travel interest and self-confidence are needed. Considering the complexity and slow progress to alleviate structural challenge which vary by individuals and contexts, such motivating mechanisms as valuable supplements are particularly crucial (McKercher and Darcy, 2018). They empower PwMI to not give up too soon on a hospitality/tourism offering or leisure travel in general and miss the associated abundant benefits (e.g. self-development and enhanced well-being) (Kleiber, 2013).

The current research proposes a motivational mechanism to effectively facilitate PwMI's travel pursuits, both in attitudes and behaviors, at contrasting levels of travel challenges[1]. Premised on self-determination theory (SDT) (Deci and Ryan, 2000), this study proposes a *self-determined* versus *controlled* subdivision underlying the predominant typologies of travel motivations by travel purposes (e.g. self-development and relaxation) (Figure 1). For each traveler, certain travel purposes (MOT1,3,...) can be categorized as self-determined motivations as primarily driven by inner desires, whereas others (MOT2,4,...) primarily driven by social influences are controlled motivations. Although satisfying people's travel purposes is the focal point, it is equally crucial to identify their underlying driving forces, as varying drivers within individuals/contexts can lead to travel-pursuit attitude and behavior variations (Jönsson and Devonish, 2008; Li and Cai, 2012). This study hypothesizes that the targeted cultivation of self-determined motivations can most effectively empower PwMI's



Notes: *AUT*: Autonomy satisfaction; *COM*: Competence satisfaction; *REL*: Relatedness satisfaction; *ITI*: Intrinsic motivation; *IDN*: Identified motivation; *ITO*: Introjected motivation; *EXT*: Extrinsic motivation; *MOT1-9...*: representing the predominant travel motivation typologies by travel purposes to be fulfilled (e.g., relaxation, education, shopping, adventure, etc.); *ATT*: Attitude toward the resort package (attitudinal dimension of travel pursuits); *PUR*: Purchase intention about the package (behavioral intention dimension); *EFF*: Persistent effort investment in exploring the package (behavioral intention dimension)

Figure 1.
The comparison of motivational effects and cultivation mechanisms for the SDT-based motivation subdivision

travel pursuits despite challenges, considering their unique strength in ameliorating intrapersonal and structural challenges (Klaeijnsen *et al.*, 2018; Dattilo *et al.*, 2018).

Despite the confirmed value of SDT applications in hospitality/tourism settings (White and Thompson, 2009; Zhang *et al.*, 2019), the potential relationship between the SDT framework and the prevailing conceptualization of travel motivations has not been systematically examined. To embody the broader and systematic social influences that exist across diverse motivations, this study posits that the SDT-based motivation differentiation is not independent from/parallel to predominant purpose-defined motivation typologies (White and Thompson, 2009), but rather should be posited as an *implicit* foundational subdivision. This new way of integrating SDT into travel motivation conceptualization can assumedly expand the explanatory power of motivations for PwMI's travel attitudes/behaviors.

To address the aforementioned practical and theoretical gaps, this study examines three research questions in the resort-vacation setting, with reliability checked across two contrasting travel challenge levels:

- RQ1. *Practical value* of the SDT-based motivation subdivision: Whether motivations by certain driving forces (i.e. self-determined versus controlled) are superior in effectively facilitating PwMI's travel pursuits despite challenges?
- RQ2. *Theoretical value* of the subdivision: Whether such subdivision can expand the explanatory power of predominant travel motivation typologies?
- RQ3. *Practical feasibility* for capitalizing on the subdivision: Whether it is practically feasible to primarily cultivate the superior travel-facilitating motivations?

2. Literature review

2.1 Self-determination theory-based motivation differentiation

Premised on SDT (Deci and Ryan, 2000), the varying extent to which an individual is motivated by inner (self-determined) versus social (controlled) values, corresponding variations in travel-pursuit attitudes, behaviors and outcomes can be expected (Teixeira and Palmeira, 2016). The primarily inner-driven self-determined motivations can be further divided into *intrinsic motivation* (ITI), where people act autonomously out of inherent interests, and *identified motivation* (IDN), where people are driven by utilitarian goals that are external to the activity pursuit itself yet consistent with inner values, and thus become fully internalized (Deci and Ryan, 2000). For instance, people traveling for *experience enrichment* may not be for its own sake, but rather feel they need to in pursuit of *social recognition*. It can be fully internalized and become an identified motivation when social recognition contributes to inner confidence. The primarily social-driven controlled motivations include *extrinsic motivation* (EXT), where people act out of expectations from acquaintances/society at large, and *introjected motivation* (ITO), where they are driven by partially internalized social pressures/incentives. Here social forces are not naturally embraced, but transferred into self-imposed pressure for avoiding guilt or maintaining contingent self-esteem. One example of this is when people feel a loss of self-esteem when they do not travel as often as their acquaintances do.

Most studies recognize self-determined motivations as facilitators, whereas controlled motivations are inhibitors of activity pursuits, both pursuit attitudes (De Groot and Steg, 2010) and behavioral intentions (e.g. to pursue/persist/persevere) (Milyavskaya and Koestner, 2011; Huang *et al.*, 2018). Self-determined motivations are known to facilitate activity pursuits despite challenges/failures (González-Cutre *et al.*; 2018; Pitzer and Skinner, 2017), due largely to nurturing activity-pursuit *interest* and *self-confidence*. Cultivation of self-determined motivations encourages autonomous judgment and self-exploration, enhancing one's inclination to associate activities with personal interests/values (Vansteenkiste *et al.*, 2018). Thus, the more relevance perceived, the stronger the activity-pursuit *interest*. Self-determined motivations also help people perceive overcoming activity-pursuit challenges as a path to growth (Dattilo *et al.*, 2018). Activity-pursuit challenges can thus facilitate *self-confidence* when interpreted in a positive light, thereby contributing to greater challenge-coping intentions (Klaeijnsen *et al.*, 2018; Tan, 2017). Considering the significant challenges that PwMI must overcome to pursue travel opportunities, self-determined motivations thus should be effective in empowering PwMI's travel pursuits despite structural and intrapersonal challenges (Q1).

A few studies that apply SDT in hospitality/tourism settings indeed found that self-determined motivations are effective in facilitating travel pursuits in terms of attitudes (Cole *et al.*, 2019) and behavioral intentions (e.g. for information searches) (Tang *et al.*, 2014; Zhang *et al.*, 2019). Yet systematic validations confirming the superior travel-facilitating

effectiveness of self-determined motivations versus controlled motivations are limited, when controlling for diverse interfering factors and with reliability check across contexts. These validations among PwMI are also warranted given their unique reliance on assisted/social support to manage related challenges and thus possibly enhanced the importance of controlled motivations (Michalovic *et al.*, 2019). Such social reliance may likely increase with challenge levels; hence, there is a need to explore challenge levels.

This study examines *H1* to address these research gaps and verify the practical value of the SDT-based motivation differentiation for PwMI's travel facilitation (*Q1*). Using a resort-vacation setting, *H1* examines the superiority of self-determined motivations in PwMI's travel facilitation across challenge levels (Figure 1). Particularly, travel-facilitation effectiveness is evaluated within the *attitudinal* travel-pursuit dimension (i.e. attitude toward a resort-vacation package) and the *behavioral intentions* travel-pursuit dimension (i.e. intentions for package purchase and for persistent effort investment in exploring the package). Facilitating these dimensions of travel-pursuit attitudes and behavioral intentions is of interest to hospitality/tourism businesses (Darcy and Pegg, 2011; Ray and Ryder, 2003). Self-determined motivations' superiority in facilitating similar dimensions is also recognized in non-tourism/hospitality activity pursuits (Milyavskaya and Koestner, 2011).

H1. Self-determined travel motivations are superior to controlled motivations in facilitating PwMI's resort-travel pursuits in terms of attitude (*H1a*: attitude toward a resort package [ATT]) and behavioral intentions (*H1b*: package purchase intention [PUR]; *H1c*: intention for persistent effort investment in exploring the package [EFF]).

2.2 People with mobility impairments and travel motivations

Hospitality/tourism studies exploring PwMI's travel motivations primarily investigate purposes/needs they fulfill, some of which are similar to other populations', such as sensational enjoyment (e.g. relaxation/adventure), intellectual/spiritual gain (e.g. escape/self-exploration) and social benefits (e.g. intimate/social relationship development) (Shi *et al.*, 2012; Kanagasabai *et al.*, 2018). Motivations more common to PwMI include proving independence/competence and seeking healing effects of travel (Adam *et al.*, 2017; Chikuta *et al.*, 2018). The potential role of motivations in resisting/overcoming travel challenges is underexplored, however.

Observations show that even with travel challenges/failures, some PwMI persist in travel pursuits, especially when motivated by self-defined meanings of the trip versus those defined by disabilities of others (Daniels *et al.*, 2005). It implies the potential speciality of some motivations (e.g. self-determined motivations) in persistently facilitating travel pursuits despite travel challenges/failures. The examination of *H1* across challenge levels hence also fills the gaps of PwMI-targeted hospitality/tourism research and practices in identifying the *challenge-resistant* motivations among PwMI to satisfy/cultivate.

2.3 Self-determination theory and travel motivation conceptualization

Progress in travel motivation conceptualization involves continually adding new factors to reflect the motivation complexity and diversity. Recently the literature has been shifted from identifying diverse motivations (i.e. individual inner needs and destination attributes) to capturing environmental/social influences that shape motivations (Hsu and Huang, 2008), such as travel companions (Gnoth and Matteucci, 2014) or travelers' cultural backgrounds (Jeng and Fesenmaier, 2002). Some examples of social needs reflected in predominant

motivation typologies are “gaining a sense of belonging” and “escaping negative social environments” (MacCannell, 2013). Yet these motivations, largely defined by social-related travel purposes, cannot adequately reflect the broader social influences on most travel purposes. Many travel motivations, seemingly irrelevant to social needs, can be driven by social forces and result in different motivational effects than being driven by inner values (Arai and Pedlar, 2003). For example, with the same motivation of learning about wine, self-determined individuals may do so for enjoyment/self-development, whereas those susceptible to social influences may target social status (White and Thompson, 2009). Likewise, the desire to travel to “strengthen emotional bonds with family/friends” owing to social expectations likely differs from the same desire driven by inner interests/values.

In validating SDT-based motivation differentiations as an implicit subdivision that underlies the predominant purpose-defined motivation typologies, *H2* tests its theoretical value (*Q2*). This proposed differentiation’s explanatory power for PwMI’s resort-travel-pursuit dimensions is examined, after controlling for the anticipated fulfillment of travel purposes (Figure 1). The reliability is also checked across challenge levels.

- H2*. Controlling for the anticipated fulfillment of travel purposes by the resort-vacation package, the SDT-based motivation subdivision still explains significant proportions of variances in PwMI’s resort-travel pursuits in terms of attitude (*H2a*: ATT) and behavioral intentions (*H2b*: PUR; *H2c*: EFF).

2.4 Practical feasibility of targeted motivation cultivation

Although the practical value of the SDT-based subdivision can be established, it cannot be fulfilled without validating the practical feasibility of specifically cultivating the superior (self-determined) travel-facilitating motivations (*Q3*). SDT literature shows that the degree of self-determination in individual motivations depends on satisfying three basic psychological needs: *autonomy, competence and relatedness* (Deci and Ryan, 2000; Olafsen *et al.*, 2018). In travel settings, autonomy indicates freely making a travel decision out of personal interest/values. Competence is reflected as a perceived possession/gain of travel capabilities when overcoming challenges. Relatedness refers to travel-related social support or meaningful social connections.

Autonomy is often demonstrated as a central facilitator of self-determined motivations and an inhibitor of controlled motivations (Frielink *et al.*, 2018). Competence can be important to self-determination development while also facilitating controlled behaviors (Gourlan *et al.*, 2016). Relatedness is the most distal facilitator of intrinsic motivation; yet, it helps internalize social incentives/pressure into identified/introjected motivation (Vansteenkiste *et al.*, 2018). The satisfaction of all three psychological needs contributes to self-determined motivations; yet, only autonomy and relatedness set self-determined motivations apart from controlled ones, which is also supported in daily activities among people with disabilities (Frielink *et al.*, 2018). *H3(a-c)* are tested across challenge levels to identify mechanistic differences between cultivating self-determined and controlled motivations, to check the potential of the targeted cultivation of superior motivations (Figure 1):

- H3*. Perceived autonomy satisfaction (AUT) and perceived relatedness satisfaction (REL) from the resort-vacation package are crucial to differentiating PwMI’s self-determined versus controlled travel motivations, whereas perceived competence satisfaction (COM) does not contribute much to the differentiation.

H3a. AUT facilitates PwMI's self-determined travel motivations only.

H3b. COM facilitates PwMI's self-determined and controlled travel motivations.

H3c. REL facilitates all PwMI's motivations except extrinsic travel motivation.

3. Methodology

3509

Data collection was conducted using Qualtrics surveys designed to measure PwMI's psychological need satisfaction, self-determined versus controlled travel motivations and travel-pursuit dimensions based on a given resort-package scenario, along with control measures. To evaluate the contextual consistency of results, an *extreme groups design* (Allison *et al.*, 1997; Preacher, 2015) was adopted to create two significantly contrasting contexts in travel challenge levels for result comparisons. As travel challenge levels are shaped by individual travel abilities and environmental accessibilities (McKercher and Darcy, 2018), to maximize the between-context challenge-level differences, the *challenging* context was created by assigning a less feasible package scenario to the sample PwMI group with weaker travel abilities (i.e. lower physical functionalities and travel frequencies), whereas the *unchallenging* context paired the more feasible scenario to the group with stronger travel abilities. To control for between-group differences other than challenge levels, control measures (see Instruments) were incorporated as covariates.

The resort-package scenario with satisfactory *value* attributes fitting the travel interests/goals of the general PwMI population (e.g. strengthening physical/mental wellness and building social connections) allows the possibility of participants becoming intrinsically motivated by the package (Figure 2). The package is also depicted with *feasibility* attributes (e.g. costs, facility accessibility and service accommodations) that capture the more feasible (individualized travel assistance and acceptable facility accessibilities) versus less feasible (little/no staff assistance and poor accessibility) scenarios. These value and feasibility attributes are based on travel motivations and barriers revealed in the PwMI literature (Buhalis and Michopoulou, 2011; Shi *et al.*, 2012). The survey design was validated by 15 psychology and tourism/hospitality scholars and practitioners specializing in accessible travel.

3.1 Participants

Eligible participants were adults with mobility impairments. Participants in the unchallenging scenario context are 80 mobility-aided adults recruited among subscribers of the Indiana Institute on Disability and Community's 2014 newsletter ($N=1,200$). Their average age is 36 ($SD=4.24$), and they are evenly distributed across genders (men 46.4 per cent; women 53.6 per cent); most are highly educated (graduate degree 41.1 per cent; bachelor's degree 39.3 per cent) and with the annual household income exceeding US\$80,000 (82.1 per cent). Average physical functionality is 0.72 ($SD=0.12$), a relatively strong level (range of 0-1). Previous year's average travel frequency is 4 ($SD=1.46$), twice as much as challenging context participants ($t(121)=-4.19, p < 0.001$).

Participants in the challenging context were recruited using email blasts from 9,000 randomly selected US subscribers of the PwMI-targeted *New Mobility* magazine. The (low) response rate of 495 completed surveys was owing to most subscribers being institutions, not people. The average age is 49, with more females (54.7 per cent). The majority has college degrees (graduate 36.8 per cent; bachelor's 33.1 per cent). The distribution across annual household income levels is consistent (\leq US\$20,000 to \geq US\$100,000). The average functionality level of 0.65 ($SD=0.124$) indicates lower mobility levels than that of

Imagine that you encounter an ad of a one-week, all-inclusive travel package to a beach resort. Its price is affordable for you and the offer has flexible schedule arrangements. The package can be yourself or for no more than eight people. The personalized travel assistance will be provided during the trip by an assigned travel assistant (note: this condition is only offered in experiment 1). In order to have a better understanding of what the resort is like, following is a list of public ratings on key characteristics of the beach resort. The ratings are: (1 star = extremely poor; 2 star = poor; 3 star = fair; 4 star = good; 5 star = extremely good). Please carefully read ALL the following ratings of the travel package characteristics, as you will be asked questions about this travel package later.

Experiment 1: Package with acceptable accessibility	Experiment 2: Package with poor accessibility
Entertainment with friends/relatives ★ ★ ★ ★ ★	Access to information about the resort facilities ★ ★ ★
Weather conditions ★ ★ ★ ★ ★	Local transportation accessibility ★ ★
Natural environment ★ ★ ★ ★ ★	Resort facility accessibility ★ ★
Transportation accessibility ★ ★	Recognizable signs for visitors ★
Opportunity for fitness activities ★ ★ ★ ★ ★	Emergency preparedness ★ ★
Capability of travel assistant ★ ★ ★	Resort front-desk service 24/7 availability ★
Access to information about tourist facilities ★ ★ ★	Staff service quality ★ ★ ★
Cultural events and festivals ★ ★ ★ ★ ★	Entertainment with friends/relatives ★ ★ ★ ★
Emergency preparedness ★ ★ ★	Opportunity of learning independent travel and living skills ★ ★ ★ ★ ★
Recognizable signs for visitors ★ ★	Natural environment ★ ★ ★
Tourist facility accessibility ★ ★ ★	Opportunity for fitness activities ★ ★ ★ ★ ★
Opportunity of learning useful living skills ★ ★ ★ ★ ★	Cultural events and festivals ★ ★ ★ ★
Resort front-desk service 24/7 availability ★ ★	Quality and variety of food ★ ★ ★
Quality and variety of food ★ ★ ★ ★ ★	Shopping opportunities ★ ★ ★
Socializing and shopping opportunities ★ ★ ★ ★	Meeting new people ★ ★ ★ ★ ★

Figure 2.
Resort-package scenarios

counterparts. The past-year travel frequency average was twice ($SD = 1.68$), much lower than unchallenging context participants.

3.2 Instruments

The measures of *perceived psychological need satisfaction* and *self-determined versus controlled travel motivations* are adapted from the need-satisfaction scale (Sheldon *et al.*, 2001) and Exercise Self-Regulation Questionnaire (Gagne *et al.*, 2003), respectively, with minor rewording to fit travel settings. Needs scale measures on a seven-point Likert scale indicate perceived truth that the resort package satisfied participants' psychological needs of *autonomy*, *competence* and *relatedness* (1 = not at all true to 7 = very true). Motivation scale measures on the same scale indicate perceived truth that such a trip would motivate participants in different ways: *intrinsic*, *identified*, *introjected* and *extrinsic*. All seven constructs are measured with three items, using corresponding item scores averaged as a construct score (Table I). Cronbach's alpha values for all constructs ($\alpha_{\text{autonomy}} = 0.7$, $\alpha_{\text{relatedness}} = 0.89$, $\alpha_{\text{competence}} = 0.84$, $\alpha_{\text{intrinsic}} = 0.87$, $\alpha_{\text{identified}} = 0.89$, $\alpha_{\text{introjected}} = 0.75$ and $\alpha_{\text{extrinsic}} = 0.74$) satisfy the commonly acceptable cut-off criteria of 0.7 (Nunnally and Bernstein, 1978).

Participants' *resort-travel pursuits* are measured using a five-point Likert scale, containing *attitude toward the package* (1 = hate it, 5 = love it), *package purchase intention* (1 = very unlikely, 5 = very likely) and intended *persistent effort investment* in further exploring the package, regardless of purchase intention (1 = very unlikely, 5 = very likely).

To exclude the variances in resort-travel pursuits explained by the anticipated fulfillment of predominant purpose-defined travel motivation types, the control variable of *anticipated travel purpose fulfillment* asks participants to rate the extent to which the resort package can fulfill their personal travel purposes (1 = not at all, 5 = very much). Other possible factors influencing the resort-travel pursuits (Lee *et al.*, 2012; Yau *et al.*, 2004) are controlled, mostly measured with original single questions (except for *functionality*):

Factors/items	Factor standard loadings	Error variances	CR	AVE
<i>Perceived psychological need satisfaction</i>				
AUT			0.84	0.63
(1) Through making this trip decision, I feel that my choice expresses my “true self”	0.68	0.47		
(2) I feel that I am free to plan this trip my own way	0.77	0.36		
(3) This trip fulfills my true interests and values	0.84	0.2		
COM			0.85	0.65
(1) Taking this trip would make me feel that I can successfully complete difficult tasks	0.79	0.37		
(2) The trip leads me to feel that I can take on and master hard challenges	0.85	0.27		
(3) I feel very capable and effective in handling this trip	0.79	0.43		
REL			0.90	0.75
(1) The trip could help me get closer to people who care for me, and those I care for	0.91	0.18		
(2) Through this trip I expect to be connected with people who are important to me	0.85	0.28		
(3) I would feel a strong sense of intimacy with the people I spent time with during the trip	0.85	0.28		
$\chi^2(18) = 26.84, p = 0.09 > 0.05, CFI = 1, SRMR = 0.019, RMSEA = 0.033$				
<i>SDT-based motivations</i>				
ITI			0.87	0.70
(1) This trip would be valuable for the pleasure I would feel when I travel there	0.86	0.32		
(2) It is for the excitement I would feel in taking such a trip	0.81	0.35		
(3) This trip would give me the pleasure of discovering my full	0.86	0.26		
IDN			0.89	0.73
(1) Taking the trip could be a good practice to become more independent	0.86	0.26		
(2) I can learn valuable things from taking this trip	0.83	0.30		
(3) I think taking this trip can be a useful way to achieve an active lifestyle	0.87	0.24		
ITO			0.87	0.60
(1) I would feel bad about myself if I do not take time to learn about this travel opportunity	0.75	0.20		
(2) Taking this trip will definitely boost my self-esteem	0.90	0.19		
(3) I would feel useless if I easily give up this travel opportunity	0.65	0.39		
EXT			0.87	0.61
(1) My family members or friends would be pleased if I decided to try this opportunity	0.85	0.26		
(2) I would take this trip if my family members or friends tell me to take it	0.72	0.23		
(3) My family and friends would be disappointed if I do not give this trip a try	0.76	0.28		
$\chi^2(36) = 64.51, p = 0.002 > 0.001, CFI = 1, SRMR = 0.021, RMSEA = 0.043$				

Table I.
CFA Results for
psychological needs
and motivations
scales

- package feasibility on a five-point Likert scale evaluating the perceived level of accessibility and service accommodations in the package;
- previous resort experience;
- overall attitude about resorts;
- travel frequency;
- frequency traveling with companions;
- overall travel satisfaction;
- number of years since impairment acquired;
- daily-living functionality; and
- socio-demographics (i.e. age, gender, household income, education level and occupation).

Functionality is measured with a single index generated from the questionnaire SF-6D, assessing six dimensions of health: bodily pain, physical functioning, role limitation, mental health, vitality and social functioning (O'Brien *et al.*, 2003). The index range of 0.3-1 indicates a poor-to-good status of physical functionality (Brazier *et al.*, 2002).

3.3 Results

The intended contextual contrast in challenge levels is first confirmed with an independent sample's *t*-test, demonstrating the significantly different *package feasibility* scores between challenging ($M = 2.27$, $SD = 0.99$) and unchallenging ($M = 4.41$, $SD = 0.54$) contexts ($t(195) = -27.2$, $p < 0.001$). The distribution of *anticipated travel purpose fulfillment* in both contexts (unchallenging: $M = 4.11$, $SD = 0.53$; challenging: $M = 3.89$, $SD = 0.67$) also confirms the intrinsically motivating potential of both package scenarios.

Confirmatory factor analyses using LISREL 8.7 supported construct validity for needs and motivations scales (Jöreskog and Sörbom, 2005) (Table I). Both scales show good data fits (Needs: $\chi^2(18) = 26.84$, $p > 0.05$, confirmatory fit index (CFI) = 1, standardized root mean square residual (SRMR) = 0.02, root mean square error of approximation (RMSEA) = 0.03; Motivations: $\chi^2(36) = 64.51$, $p > 0.001$, CFI = 1, SRMR = 0.02, RMSEA = 0.04). With significant factor loadings (0.65–0.91) ($p < 0.001$), all constructs' composite reliability levels (0.84-0.9) are also greater than 0.7, the acceptable threshold (Hair *et al.*, 1998). Higher than the cutoff of 0.5 (Netemeyer *et al.*, 2003), the average variance extracted value (0.63-0.75) for each construct is higher than its squared correlations with other constructs (0.53-0.67), which further establishes discriminant validity.

3.3.1 Systematic comparisons of self-determined and controlled travel-facilitating effects. Multivariate regressions of resort-travel-pursuit dimensions (ATT, PUR and EFF) on four motivation types are conducted using STATA 14.2 software within challenging and unchallenging contexts, respectively. The superior effectiveness of self-determined motivations in travel facilitation is checked by comparing the effects of self-determined and controlled motivations on resort-travel-pursuit dimensions (*H1*). To verify the explanatory power of this SDT-based motivation subdivision on top of the predominant purpose-defined motivation typologies (*H2*), the *anticipated travel purpose fulfillment* measure is controlled. Additional control measures involve those having statistically significant correlations with the dependent variable (DV) at the 0.05 level across both contexts.

Regression done on four motivation types simultaneously is based on SDT's assumption that activity pursuits may be driven by mixtures of self-determined and controlled motivations, although some motivations are expected to become primary driving forces for

decision-making (Deci and Ryan, 2008). Given the potential correlations between motivations, there may be overlap in explained variances of DVs by four motivation types. Although the potential multicollinearity is not a direct statistical assumption of multiple regression (Osborne and Waters, 2002), it can result in the underestimation of predictor statistical significance, given the potential inflation of standard errors (Kumari, 2012) and can also cause difficulties in accurately assessing *main/actual* and *independent* motivational effects (Nimon *et al.*, 2010). For instance, a high β value may not indicate a strong main effect from each motivation type on DV, as it may only reflect a suppressor effect. Moreover, the independent effect of each motivation type is not assessable from its binary relationship with the DV measure, nor can Pearson r or R^2 alone evaluate travel-facilitation differences between self-determined and controlled motivations (Thompson, 2006).

To resolve such difficulties, instead of relying on the regression weight β and Pearson r correlation for effect comparisons, this study incorporates an alternative system of analytical information (squared structure coefficient r_s^2 and relative importance weights RIW) to accurately identify main/unique effects of each motivation type (Kraha *et al.*, 2012; Henson, 2002). r_s^2 is superior to the possibly inaccurate β value in assessing the *actual* predictive utility of each motivation, by revealing variance percentages in the *predicted DV* that is accounted for by a motivation and excludes suppressor effects (Thompson, 2006). RIW is evaluated to determine the *unique* proportion of R^2 that can be explained by each motivation type, with correction for effects of predictor intercorrelations (Lorenzo-Seva *et al.*, 2010). Although not accurately reflecting the unique predictive power of each motivation, the Pearson r correlation is still included, as none of the above indicators can identify *valence* of relationship (negative/positive) between each predictor and DV. The regression coefficients b and β are not interpreted given their potentially compromised accuracy because of multicollinearity. Combining r_s^2 , r and RIW (interpreted with R^2) results in a systematic and competitively accurate assessment of the relative importance of motivation types in explaining resort-travel pursuits (Table II). These indices are estimated using the MIMR-Raw.sps program developed by Lorenzo-Seva *et al.* (2010).

For regression analyses examining *H1-H2a*, controlling for *anticipated travel purpose fulfillment* and covariates (package feasibility, overall attitude about resorts and age) significantly correlated with *ATT*, only intrinsic motivation dominates in main and unique variances explained in the *ATT* measure under the unchallenging context, assessed from r_s^2 and RIW , respectively (ITI>EXT>IDN>ITO: $r_s^2 = 0.75 > 0.68 > 0.53 > 0.43$, $RIW = 0.217 > 0.184 > 0.126 > 0.076$). Yet both self-determined motivation types dominate under the challenging context (IDN>ITI>ITO>EXT: $r_s^2 = 0.71 > 0.68 > 0.54 > 0.47$, $RIW = 0.157 > 0.145 > 0.106 > 0.092$). Hence, *H1a* is only supported under the challenging context. Under the unchallenging (challenging) context, the SDT-based subdivision explains a unique 26 per cent (29 per cent)[2] of variances in *ATT*, after controlling for *anticipated travel purpose fulfillment* that explains 0.7 per cent (14 per cent), thus supporting the theoretical value of the proposed subdivision (*H2a*).

In the prediction of *PUR*, after controlling for *anticipated travel purpose fulfillment* and covariates (package feasibility, overall attitude about resorts, previous resort experience and travel frequency), under the unchallenging context controlled motivations dominate actual and unique explained variances (EXT>ITO>IDN>ITI: $r_s^2 = 0.49 > 0.43 > 0.33 > 0.25$, $RIW = 0.18 > 0.095 < 0.103 > 0.069$), whereas self-determined motivations dominate only under the challenging context (ITI/IDN>ITO>EXT: $r_s^2 = 0.7 > 0.61 > 0.58 > 0.52$, $RIW = 0.111 < 0.12 > 0.11 > 0.109$). *H1b* is thus supported only under the challenging context. In the unchallenging (challenging) context, the subdivision explains a unique

Table II.
Regression results
and comparative
indices for SDT-
based resort-travel
facilitation

Predictor	Unchallenging group					Challenging group						
	<i>r</i>	β	r_s^2	95% CI	RIW	95% CI	<i>r</i>	β	r_s^2	95% CI	RIW	95% CI
<i>ATT</i>												
ITI	0.57**	0.32	0.74	0.37, 0.86	0.217	0.105, 0.305	0.64**	0.11	0.68	0.57, 0.77	0.145	0.113, 0.178
IDN	0.48**	-0.14	0.53	0.14, 0.77	0.126	0.057, 0.213	0.66**	0.21**	0.71	0.61, 0.79	0.157	0.123, 0.188
ITO	0.43**	-0.10	0.44	0.11, 0.67	0.076	0.034, 0.16	0.57**	0.03	0.54	0.42, 0.64	0.106	0.077, 0.137
EXT	0.54**	0.31	0.69	0.27, 0.88	0.184	0.07, 0.316	0.53**	0.02	0.47	0.36, 0.57	0.092	0.067, 0.123
Anticipated travel purpose fulfillment	0.11	-0.05	0.03	0.01, 0.18	0.017	0.008, 0.104	0.67**	0.28***	0.75	0.64, 0.82	0.240	0.189, 0.292
Package feasibility	0.36**	0.23	0.29	0.06, 0.55	0.139	0.033, 0.323	0.66**	0.28***	0.72	0.61, 0.82	0.245	0.187, 0.318
Overall resort preference	0.33**	0.08	0.25	0.01, 0.53	0.064	0.013, 0.199	0.14**	-0.01	0.03	0.005, 0.07	0.008	0.003, 0.023
Age	-0.38**	-0.22*	0.35	0.10, 0.56	0.177	0.028, 0.341	-0.16**	0.03	0.04	0.01, 0.10	0.007	0.003, 0.024
R^2				0.43						0.57		
<i>F</i>				6.59***						76.04***		
<i>N</i>				78						407		
<i>PUR</i>												
ITI	0.30**	-0.43*	0.25	0.03, 0.50	0.069	0.041, 0.14	0.60**	0.06	0.70	0.48, 0.68	0.111	0.085, 0.14
IDN	0.48**	0.04	0.33	0.06, 0.60	0.103	0.051, 0.217	0.60**	0.03	0.61	0.49, 0.67	0.120	0.086, 0.135
ITO	0.40**	-0.00	0.43	0.15, 0.61	0.095	0.046, 0.17	0.59**	0.13*	0.58	0.28, 0.64	0.110	0.086, 0.151
EXT	0.43**	0.57*	0.49	0.16, 0.67	0.180	0.06, 0.28	0.55**	0.11*	0.52	0.38, 0.59	0.109	0.077, 0.144
Anticipated travel purpose fulfillment	0.17	-0.03	0.08	0.001, 0.27	0.025	0.009, 0.168	0.66**	0.23***	0.70	0.59, 0.77	0.213	0.168, 0.26
Package feasibility	0.33**	0.21	0.30	0.06, 0.53	0.130	0.023, 0.269	0.70**	0.38***	0.80	0.69, 0.87	0.301	0.245, 0.355
Overall resort preference	0.39**	0.12	0.41	0.12, 0.68	0.122	0.027, 0.318	0.20**	0.05	0.07	0.02, 0.13	0.021	0.006, 0.045
Previous resort experience	-0.26*	-0.14	0.18	0.03, 0.35	0.106	0.033, 0.212	0.12**	0.02	0.02	0.001, 0.08	0.006	0.001, 0.025
Travel frequency	0.45**	0.19	0.56	0.21, 0.70	0.169	0.051, 0.26	0.10**	0.06	0.02	0.0002, 0.06	0.009	0.001, 0.032
R^2				0.37						0.62		
<i>F</i>				4.51***						71.19***		
<i>N</i>				78						407		

(continued)

Predictor	Unchallenging group				Challenging group					
	r	β	r_s^2	95% CI	RIW	95% CI	r_s^2	95% CI	RIW	95% CI
<i>EFF</i>										
IT1	0.41**	-0.44*	0.44	0.14, 0.74	0.130	0.096, 0.206	0.31**	0.09	0.186	0.091, 0.278
IDN	0.50**	0.18	0.67	0.31, 0.89	0.240	0.131, 0.361	0.31**	0.12**	0.191	0.097, 0.291
ITO	0.46**	0.11	0.56	0.24, 0.77	0.186	0.081, 0.324	0.24**	-0.08	0.083	0.053, 0.162
EXT	0.55**	0.65**	0.81	0.45, 0.95	0.336	0.191, 0.424	0.28**	0.10	0.165	0.074, 0.28
Expected travel purpose fulfillment	0.08	-0.02	0.02	0.03, 0.15	0.012	0.006, 0.098	0.31**	0.17**	0.270	0.102, 0.458
Package feasibility	0.27*	0.21	0.19	0.02, 0.43	0.096	0.009, 0.274	0.24**	0.01	0.106	0.044, 0.236
R^2				0.37				0.45		
F				7.03***				9.83***		
N				78				407		

Notes: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table II.

17 per cent (28 per cent) of variances in *PUR*, in addition to the 1 per cent (13 per cent) explained by *anticipated travel purpose fulfillment*, hence supporting *H2b*.

Similarly, *H1c* is accepted only under the challenging context. Regarding the explained actual variance and unique portion in *EFF*, controlling for *anticipated travel purpose fulfillment* and the covariate *package feasibility*, extrinsic motivation dominates under the unchallenging context (EXT>IDN>ITO> ITI: $r_s^2 = 0.81 > 0.67 > 0.56 > 0.44$, $RIW = 0.336 > 0.24 > 0.186 > 0.13$). Under the challenging context, it is dominated by self-determined motivations (IDN>ITI>EXT>ITO: $r_s^2 = 0.77 > 0.76 > 0.61 > 0.46$, $RIW = 0.191 > 0.186 > 0.165 > 0.083$). *H2c* is also supported, as under the unchallenging (challenging) context, the SDT-based subdivision explains a unique 33 per cent (8 per cent) of *EFF* variances, a significant supplementary power to 0.4 per cent (4 per cent) explained by *anticipated travel purpose fulfillment*. Notably, all motivations positively facilitate each of the resort-travel-pursuit dimensions ($r > 0$) while varying only in effectiveness levels.

Importantly, the bootstrapping procedure for the estimated indices generates 5,000 samples and produces the 95 per cent bias-corrected confidence intervals (CIs) for all estimates (Table II). None of the CIs contain zero in the ranges and hence confirm the reliability of estimates. Overall, *H2* can be supported, whereas *H1* is only supported under challenging contexts.

3.3.2 Practical feasibility of differentiating self-determined and controlled motivations. *H3(a-c)* investigates the potential mechanism differences in cultivating self-determined versus controlled motivations, which makes the targeted cultivation of superior travel-facilitating motivations feasible. The system of seemingly unrelated regressions (SURs) is conducted with a feasible generalized least-squares estimator using STATA 14.2 software. SUR simultaneously estimates a series of “seemingly unrelated” regressions that share errors, with possibly varied repressors or DVs across equations (Zellner, 1962). It is adopted herein to provide the variance-covariance matrix for the compared effects of each psychological-need construct on different motivation types, the basis for effect comparisons. It also provides more accuracy by accounting for related errors when estimating motivation-cultivating mechanisms separately for highly correlated motivation types.

With standardized variables used in regressions, differences between regression coefficients based on different motivation DVs are compared using bootstrapping analyses (Preacher and Hayes, 2008). The procedure generates 5,000 samples and provides the 95 per cent bias-corrected CIs, where the interval that includes (excludes) zero disconfirming (confirming) the significance of effect differences. In SUR results (Table III), AUT, COM and REL are found to facilitate both self-determined and controlled motivations; hence *H3a* and *H3c* are rejected, whereas *H3b* is accepted. The differentiation of self-determined and controlled motivations, however, would still be feasible if any psychological-need constructs facilitate self-determined and controlled motivations to different extents.

Bootstrapping results (Table IV) show that under the unchallenging context, no significant AUT/COM/REL facilitating differences are found between self-determined and controlled motivations (with CI ranges containing 0). Only AUT facilitates greater extrinsic than introjected motivation ($\beta_{\text{introjected}} - \beta_{\text{extrinsic}} = -0.21$, $p < 0.01$, 95 per cent CI = $[-0.35, -0.07]$). Under the challenging context, however, significant differences result from all need constructs. AUT fosters the greatest intrinsic motivation, followed by identified motivation, and lastly controlled motivations ($\beta_{\text{intrinsic}} - \beta_{\text{identified}} = 0.06$, $p < 0.01$, 95 per cent CI = $[0.02, 0.11]$; $\beta_{\text{identified}} - \beta_{\text{introjected}} = 0.1$,

Predictor	ITI			IDN			ITO			EXT		
	β (SE)	95% CI	β (SE)	95% CI	β (SE)	95% CI	β (SE)	95% CI	β (SE)	95% CI		
<i>Unchallenging scenario (N = 79)</i>												
AUT	0.71*** (0.08)	0.55, 0.86	0.72*** (0.08)	0.57, 0.88	0.58*** (0.09)	0.4, 0.76	0.79*** (0.07)	0.65, 0.92	0.79*** (0.07)	0.65, 0.92		
χ^2 (79)	78.68***		87.41***		40.31***		129.68***		129.68***			
R^2	0.50		0.53		0.34		0.62		0.62			
COM	0.67*** (0.08)	0.51, 0.83	0.63*** (0.09)	0.46, 0.8	0.57*** (0.09)	0.39, 0.75	0.7*** (0.08)	0.54, 0.86	0.7*** (0.08)	0.54, 0.86		
χ^2 (79)	64.02***		52.77***		38.47***		76.72***		76.72***			
R^2	0.45		0.4		0.33		0.49		0.49			
REL	0.77*** (0.07)	0.63, 0.91	0.75*** (0.07)	0.6, 0.89	0.63*** (0.09)	0.46, 0.8	0.76*** (0.07)	0.61, 0.9	0.76*** (0.07)	0.61, 0.9		
χ^2 (79)	117.04***		99.61***		52.66***		104.89***		104.89***			
R^2	0.6		0.56		0.4		0.57		0.57			
<i>Challenging scenario (N = 408)</i>												
AUT	0.71*** (0.04)	0.64, 0.78	0.64*** (0.04)	0.57, 0.72	0.54*** (0.04)	0.46, 0.62	0.53*** (0.04)	0.44, 0.61	0.53*** (0.04)	0.44, 0.61		
χ^2 (408)	406.88***		287.19***		169.42***		155.53***		155.53***			
R^2	0.5		0.41		0.29		0.28		0.28			
COM	0.78*** (0.03)	0.72, 0.84	0.76*** (0.03)	0.7, 0.83	0.62*** (0.04)	0.55, 0.7	0.6*** (0.04)	0.52, 0.68	0.6*** (0.04)	0.52, 0.68		
χ^2 (408)	621.42***		574.83***		263.57***		232.02***		232.02***			
R^2	0.6		0.58		0.39		0.36		0.36			
REL	0.7*** (0.04)	0.63, 0.76	0.68*** (0.04)	0.61, 0.75	0.59*** (0.04)	0.51, 0.67	0.59*** (0.04)	0.51, 0.67	0.59*** (0.04)	0.51, 0.67		
χ^2 (408)	381.32***		348.7***		219.39***		214.13***		214.13***			
R^2	0.48		0.46		0.35		0.34		0.34			

Notes: * $p < 0.05$; ** $p \leq 0.01$; *** $p < 0.001$

Table III.
Seemingly unrelated
regression for SDT-
based motivation
cultivations

Table IV.
Bootstrapping of
motivation
cultivation
differences (5,000
replications)

Predictor	ITI vs IDN		ITI vs ITO		ITI vs EXT		IDN vs ITO		IDN vs EXT		ITO vs EXT	
	β_{diff} (SE)	95% CI	β_{diff} (SE)	95% CI	β_{diff} (SE)	95% CI	β_{diff} (SE)	95% CI	β_{diff} (SE)	95% CI	β_{diff} (SE)	95% CI
<i>Unchallenging scenario (N = 79)</i>												
AUT	-0.02 (0.05)	-0.11, 0.07	0.13 (0.08)	-0.03, 0.28	-0.08 (0.05)	-0.18, 0.01	0.14 (0.08)	-0.02, 0.3	-0.06 (0.04)	-0.15, 0.02	-0.21** (0.07)	-0.35, -0.07
COM	0.04 (0.07)	-0.09, 0.17	0.10 (0.10)	-0.10, 0.29	-0.03 (0.06)	-0.15, 0.09	0.06 (0.09)	-0.12, 0.24	-0.07 (0.05)	-0.17, 0.03	-0.13 (0.08)	-0.28, 0.03
REL	0.03 (0.07)	-0.11, 0.16	0.14 (0.08)	-0.02, 0.3	0.02 (0.06)	0.1, 0.13	0.11 (0.08)	-0.05, 0.28	-0.01 (0.05)	-0.1, 0.09	-0.12 (0.07)	-0.26, 0.02
<i>Challenging scenario (N = 408)</i>												
AUT	0.06** (0.02)	0.02, 0.11	0.16*** (0.03)	0.1, 0.23	0.18*** (0.03)	0.11, 0.25	0.1** (0.03)	0.03, 0.17	0.12*** (0.03)	0.06, 0.18	0.02 (0.04)	-0.05, 0.09
COM	0.01 (0.02)	-0.03, 0.05	0.15*** (0.03)	0.09, 0.21	0.17*** (0.03)	0.11, 0.24	0.14*** (0.03)	0.07, 0.2	0.16*** (0.03)	0.1, 0.23	0.02 (0.04)	-0.05, 0.1
REL	0.02 (0.02)	-0.02, 0.06	0.1** (0.03)	0.04, 0.17	0.11** (0.04)	0.03, 0.18	0.09** (0.03)	0.02, 0.15	0.09** (0.04)	0.02, 0.16	0.005 (0.04)	-0.07, 0.08

Notes: * $p < 0.05$, ** $p \leq 0.01$, *** $p < 0.001$

$p < 0.01$, 95 per cent CI = [0.03, 0.17]; $\beta_{\text{identified}} - \beta_{\text{extrinsic}} = 0.12$, $p < 0.001$, 95 per cent CI = [0.06, 0.18]). Similar results are shown for both COM and REL, except that intrinsic and identified motivations are equally facilitated (with CI ranges containing 0). $H3$ can thus be accepted in the challenging context.

4. Conclusions

Intended as a promising supplement to the primary scholarly/industrial concentration on the facility/service accommodation of PwMI's travel pursuits, this study advocates empowering PwMI psychologically by intentionally cultivating superior motivations in travel-facilitating effectiveness and challenge resistance, which can be identified based on a proposed SDT-based motivation subdivision. The $H1$ examination supports the dominant effectiveness of self-determined motivations in facilitating PwMI's resort-travel attitudes and behavioral intentions given significant travel challenges. This echoes the non-travel SDT applications positing that self-determined motivations more saliently facilitate activity-pursuit attitudes and behavioral intentions when activities are difficult to achieve (González-Cutre *et al.*, 2018). The practical value of the SDT-based subdivision for identifying superior travel-facilitating motivations is thus confirmed ($Q1$).

In the unchallenging context, only intrinsic motivation is superior to controlled motivations in facilitating the resort-travel attitude ($H1a$), whereas controlled motivations demonstrate dominance in facilitating behavioral intentions ($H1b-c$). These findings, aligned with a handful of existing SDT applications (Lee *et al.*, 2005; Cole *et al.*, 2019), suggest that while *perceptual/abstractive* aspects of travel pursuits (i.e. attitudes) are largely determined by the inner-driven intrinsic motivation, *rational/concrete* behaviors of travel pursuits may nevertheless be dictated by externally driven controlled motivations, such as opinions of caregivers. This can be attributed to the strong desire of PwMI in general to reciprocate the favor of care to their caregivers (Yau *et al.*, 2004); hence, their willingness to travel out of companions' expectations more than inner interest when challenges are manageable. Such dominance of controlled motivations is largely possible for less demanding activity pursuits (Aitken *et al.*, 2016), where self-determined motivations may be unnecessary, but is not necessarily the case when major challenges are encountered. Such a variation from the broadly observed dominance of self-determined motivations (Huang *et al.*, 2018) further supports the need for contextual considerations in future SDT applications.

An interesting observation is the relative effectiveness of *identified* motivation over *intrinsic* motivation across challenge levels. This is understandable as identified motivation may have greater impacts on the initial/short-term activity adoption, whereas intrinsic motivation is more crucial to long-term activity persistence (Ryan and Powelson, 1991). Future exploration of longitudinal motivational effects (e.g. loyalty) may indeed support the dominance of intrinsic motivation. It is also a hopeful finding, as identified motivation should be more easily fostered than intrinsic motivation, given that the comparative ease to persuade less interested people to travel out of utilitarian goals in accordance with their core values than significantly enhance their travel interests.

The acceptance of $H2$ justifies the theoretical value of extending the SDT-based subdivision to purpose-defined travel motivation typologies ($Q2$), given its significant supplementary explanatory power for travel pursuits to anticipated travel purpose fulfillment. It confirms the value of differentiating travel motivations not only by travel purposes but also based on the inner versus social driving forces underlying those purposes. The practical feasibility of primarily cultivating superior travel-facilitating motivations ($Q3$) is only confirmed in the challenging context (conditionally accepted $H3$), where supporting each psychological need (autonomy, competence and relatedness) facilitates significantly

greater self-determined motivations than controlled ones. Yet in the unchallenging context, self-determined and controlled motivations are similarly facilitated by need satisfaction. This coincides with research of Aitken *et al.* (2016) that given sufficient support, greater self-determination can be derived from significant challenges. It is therefore necessary to satisfy all three psychological needs to foster challenge-resistant, self-determined motivations, as the dissatisfaction of any one need also seriously hinders self-determined motivations. Given low travel challenges, intentional cultivation of controlled motivations, the more effective travel facilitator, is not feasible.

The surprising positive association found between perceived *autonomy* satisfaction and *extrinsic* motivation (rejected *H3a*) should be associated with PwMI's high dependence on social support and the resulted unique conceptualization of self-determination, where a harmonious dependence between self and close others can also achieve a personal sense of self-determination (Yau *et al.*, 2004). Under this conceptualization, PwMI may not perceive family/social influences as coercive, but as an autonomous choice (thus rejecting *H3a*) in return for their social support (rejecting *H3c*). A similar finding has also been observed between collectivist and individualist cultures (Aitken *et al.*, 2016), where closeness and compliance to family/community objectives are valued as parts of inner values.

5. Theoretical implications

This research extends the predominant purpose-defined travel motivation typologies with an SDT-based subdivision. Future identification of travel motivations thereby should not only be confined to *what* travel purposes are pursued but also to *why* pursuing them (i.e. self-determined or controlled), to gain greater power in explaining/predicting travel attitudes/behaviors. Moreover, in establishing the value and feasibility of cultivating superior travel motivations, it supplements the prevailing explorations of structural challenge removals with the possibility of psychologically empowering PwMI's travel pursuits.

The proposed subdivision also represents a new way to integrate SDT into travel motivation conceptualizations, though SDT has been traditionally treated as independent from existing motivation typologies. Such integration would allow a more accurate reflection of the widespread presence and impact of social factors wherein any travel purpose may be formed by interactive influences of inner values and social environment.

Methodologically, statistical approaches producing competitively accurate and efficient effect comparisons are demonstrated and recommended for future applications, such as a system of statistical indices (r , r_s^2 and *RIW*) to compare effects while addressing possible multicollinearity issues, as well as the applied SUR to compare somewhat correlated effects.

6. Practical implications

It is crucial for hospitality/tourism businesses to identify strategies that effectively motivate PwMI to persist in travel attempts, especially when their PwMI-targeted accessibility/service offerings are gradually improving but not yet meeting market expectations. Study findings provide a valuable guide to more effective hospitality/tourism marketing for PwMI, by *identifying* and *satisfying*, or more powerfully, *cultivating* superior travel-facilitating motivations corresponding to both individual and environmental challenge levels. Although it is ideal to satisfy all personal travel purposes, it is only realistic to concentrate the limited marketing resources on the most effective and challenge-resistant motivations for the efficient empowerment of PwMI's travel pursuits. Such practices after validation may be extended to the general traveler market.

For the SDT-based *motivation identification* and *satisfaction*, it is common for hospitality/tourism marketers to identify customers' travel purposes (e.g. adventure and relaxation) and offer products/services to fulfill them (e.g. tours and spas). These purposes and corresponding products/services can be categorized into the SDT subdivision based on the extent they fulfill:

- personal interests;
- embraced utilitarian goals (e.g. enhance health and restored energy for work);
- contingent self-esteem; and
- the need to cater to others' interests.

For example, whenever individuals view/write/share Web or social media posts on a travel-related product/service, industry professionals can identify whether the product/service is indicated as primarily fitting their chronic interests and personalities (*intrinsic*) or mostly fitting desired goals (e.g. health/self-development) in the context of their current life status (*identified*); or whether it primarily fits the popular product/service preferences/experiences in their social network (*introjected*) or only fits close others' interests but conflicts with their own interest (*extrinsic*). This is a feasible task given the big-data analysis techniques (e.g. machine learning) now available. Furthermore, for PwMI with lower (higher) physical functionality or rarely (frequently) travel, or when the accessibility/service level of a hospitality/tourism business is satisfactory (unsatisfactory) to average PwMI, the business should customize its promotions by focusing on products/services satisfying self-determine (controlled) motivations to effectively encourage this group to explore or purchase its offerings.

A more effective and strongly needed approach under significant travel challenges should be to purposefully *cultivate* challenge-resistant self-determined motivations, by supporting all three psychological needs in marketing efforts. Autonomy can be supported by inspiring PwMI to explore and fulfill their essential values/interests while enjoying hospitality/tourism products, via short surveys that help them identify their essential values (e.g. self-confidence, altruism and nature preservation) and correspondingly recommend products/services to fulfill those values. Competence can be supported by incorporating objective assistance (i.e. providing practical challenge-coping tips) or enhancing subjectively perceived self-competence (i.e. using an app/Web-embedded function enabling customers to break down complex challenges into small tasks or to anticipate gained strengths by overcoming challenges). Finally, relatedness support could be achieved through incorporating experiences of people with similar challenges into product/service promotions, emphasizing the social pleasures/benefits with like-minded fellows, or well-trained staff who provide personalized, skillful and caring support.

7. Limitations and future research

Limitations of this study include its adopted extreme groups design, which is limited regarding generalizing to more fine-sorted challenge levels than the random assignment of two package scenarios within each participant group. Although potential between-group differences are controlled as covariates, the randomized design can also more restrictively control for influences irrelevant to travel challenges.

Although meeting relaxed standards for minimum sample sizes required in regressions (Yau *et al.*, 2004), sample size in the unchallenging group is small (<80). A G*Power post hoc power analysis was conducted to verify the extent of power (>0.95), along with the bootstrapping procedure, verifying the reliability. Yet undetected bias because of the sample

size should still be interpreted with caution. Finally, this study only examines the PwMI population in the USA, which may limit its generalizability to other regions.

Theoretical and practical implications can be extended by future explorations of the differentiation *within* self-determined or controlled motivations in travel-facilitation effectiveness, e.g. why introjected motivation displays a somewhat deviated facilitating pattern compared with extrinsic motivation. Revealed merits of controlled motivations to PwMI's travel pursuits also shed light on the potential cross-population difference in self-determination conceptualization, which should be re-validated among different populations. Future research can also develop approaches to embed the identification, satisfaction and cultivation of the most empowering motivations by individual/context in marketing programs and examine their effectiveness via field experiments. Hospitality sectors that are not related to travel may also consider exploring this SDT subdivision to extend existing customer motivation structures, which can guide strategic marketing designs to more effectively attract and retain customers despite service challenges or failures.

Notes

1. Focusing on reliability check across levels of *structural travel challenges* only, "travel challenges" herein is short for "structural challenges" unless specified.
2. Calculated with $RIW_{SDT} * R^2 = 0.61 * 0.043 = 26\%$.

References

- Adam, I., Kumi-Kyereme, A. and Boakye, K.A. (2017), "Leisure motivation of people with physical and visual disabilities in Ghana", *Leisure Studies*, Vol. 36, pp. 315-328.
- Aitken, N.M., Pelletier, L.G. and Baxter, D.E. (2016), "Doing the difficult stuff: influence of self-determined motivation toward the environment on", *Transportation Proenvironmental Behavior. Ecopsychology*, Vol. 8 No. 2, pp. 153-162.
- Allison, D.B., Allison, R.L., Faith, M.S., Paultre, F. and Pi-Sunyer, F.X. (1997), "Power and money: designing statistically powerful studies while minimizing financial costs", *Psychological Methods*, Vol. 2 No. 1, pp. 20.
- Anand, P. and Ben-Shalom, Y. (2014), "How do working-age people with disabilities spend their time? New evidence from the American time use survey", *Demography*, Vol. 51 No. 6, pp. 1977-1998.
- Arai, S. and Pedlar, A. (2003), "Moving beyond individualism in leisure theory: a critical analysis of concepts of community and social engagement", *Leisure Studies*, Vol. 22 No. 3, pp. 185-202.
- Boxall, K., Nyanjom, J. and Slaven, J. (2018), "Disability, hospitality and the new sharing economy", *International Journal of Contemporary Hospitality Management*, Vol. 30 No. 1, pp. 539-556.
- Brazier, J., Roberts, J. and Deverill, M. (2002), "The estimation of a preference-based measure of health from the SF-36", *Journal of Health Economics*, Vol. 21 No. 2, pp. 271-292.
- Buhalis, D. and Michopoulou, E. (2011), "Information-enabled tourism destination marketing: addressing the accessibility market", *Current Issues in Tourism*, Vol. 14 No. 2, pp. 145-168.
- Chikuta, O., Du Plessis, E. and Saayman, M. (2018), "Accessibility expectations of tourists with disabilities in national parks", *Tourism Planning and Development*, No. 1, pp. 18.
- Cole, S., Zhang, Y., Wang, W. and Hu, C.-M. (2019), "The influence of accessibility and motivation on leisure travel participation of people with disabilities", *Journal of Travel and Tourism Marketing*, Vol. 36, pp. 119-130.

-
- Daniels, M.J., Rodgers, E.B.D. and Wiggins, B.P. (2005), "Travel tales: an interpretive analysis of constraints and negotiations to pleasure travel as experienced by persons with physical disabilities", *Tourism Management*, Vol. 26 No. 6, pp. 919-930.
- Darcy, S. and Pegg, S. (2011), "Towards strategic intent: perceptions of disability service provision amongst hotel accommodation managers", *International Journal of Hospitality Management*, Vol. 30 No. 2, pp. 468-476.
- Dattilo, J., Mogle, J., Lorek, A.E., Freed, S. and Frysinger, M. (2018), "Using self-determination theory to understand challenges to aging, adaptation, and leisure among community-dwelling older adults", *Activities, Adaptation and Aging*, Vol. 42, pp. 85-103.
- de Groot, J.I. and Steg, L. (2010), "Relationships between value orientations, self-determined motivational types and pro-environmental behavioural intentions", *Journal of Environmental Psychology*, Vol. 30 No. 4, pp. 368-378.
- Deci, E.L. and Ryan, R.M. (2000), "The 'what' and 'why' of goal pursuits: human needs and the self-determination of behavior", *Psychological Inquiry*, Vol. 11 No. 4, pp. 227-268.
- Deci, E.L. and Ryan, R.M. (2008), "Facilitating optimal motivation and psychological well-being across life's domains", *Canadian Psychology/Psychologie Canadienne*, Vol. 49 No. 1, pp. 14-23.
- Frielink, N., Schuengel, C. and Embregts, P.J. (2018), "Autonomy support, need satisfaction, and motivation for support among adults with intellectual disability: testing a self-determination theory model", *American Journal on Intellectual and Developmental Disabilities*, Vol. 123 No. 1, pp. 33-49.
- Gagne, M., Ryan, R.M. and Bargmann, K. (2003), "Autonomy support and need satisfaction in the motivation and well-being of gymnasts", *Journal of Applied Sport Psychology*, Vol. 15 No. 4, pp. 372-390.
- Gnoth, J. and Matteucci, X. (2014), "A phenomenological view of the behavioural tourism research literature", *International Journal of Culture, Tourism and Hospitality Research*, Vol. 8 No. 1, pp. 3-21.
- González-Cutre, D., Sierra, A.C., Beltrán-Carrillo, V.J., Peláez-Pérez, M. and Cervelló, E. (2018), "A school-based motivational intervention to promote physical activity from a self-determination theory perspective", *The Journal of Educational Research*, Vol. 111 No. 3, pp. 320-330.
- Gourlan, M., Trouilloud, D. and Boiché, J. (2016), "Motivational profiles for physical activity practice in adults with type 2 diabetes: a self-determination theory perspective", *Behavioral Medicine*, Vol. 42 No. 4, pp. 227-237.
- Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E. and Tatham, R.L. (1998), *Multivariate Data Analysis*, Prentice Hall, Upper Saddle River, NJ.
- Henson, R.K. (2002), "The logic and interpretation of structure coefficients in multivariate general linear model analyses", *The Annual Meeting of the American Educational Research Association, New Orleans, LA*.
- Hsu, C.H. and Huang, S. (2008), "Travel motivation: a critical review of the concept's development", *Tourism Management: Analysis, Behaviour and Strategy*, pp. 14-27.
- Huang, C.-H., Lings, I., Beatson, A. and Chou, C.Y. (2018), "Promoting consumer environmental friendly purchase behaviour: a synthesized model from three short-term longitudinal studies in Australia", *Journal of Environmental Planning and Management*, Vol. 61 No. 12, pp. 2067-2093.
- Jeng, J. and Fesenmaier, D.R. (2002), "Conceptualizing the travel decision-making hierarchy: a review of recent developments", *Tourism Analysis*, Vol. 7 No. 1, pp. 15-32.
- Jönsson, C. and Devonish, D. (2008), "Does nationality, gender, and age affect travel motivation? A case of visitors to the Caribbean Island of Barbados", *Journal of Travel and Tourism Marketing*, Vol. 25, pp. 398-408.
- Jöreskog, K.G. and Sörbom, D. (2005), "LISREL 8.7 for windows", Lincolnwood, IL, available at: www.ssicentral.com/lisrel
- Kanagasabai, P.S., Mulligan, H., Hale, L.A., Mirfin-Veitch, B. (2018), "I do like the activities which I can do . . . leisure participation experiences of children with movement impairments", *Disability and Rehabilitation*, Vol. 40 No. 14, pp. 1630-1638.

- Klaeijnsen, A., Vermeulen, M. and Martens, R. (2018), "Teachers' innovative behaviour: the importance of basic psychological need satisfaction, intrinsic motivation, and occupational self-efficacy", *Scandinavian Journal of Educational Research*, Vol. 62 No. 5, pp. 769-782.
- Kleiber, D.A. (2013), "Redeeming leisure in later life", *Positive Leisure Science*, Springer, New York, NY.
- Kraha, A., Turner, H., Nimon, K., Zientek, L.R. and Henson, R.K. (2012), "Tools to support interpreting multiple regression in the face of multicollinearity", *Frontiers in Psychology*, Vol. 3.
- Kumari, S.S. (2012), "Multicollinearity: estimation and elimination", *Journal of Contemporary Research in Management*, Vol. 3.
- Lee, B.K., Agarwal, S. and Kim, H.J. (2012), "Influences of travel constraints on the people with disabilities' intention to travel: an application of Seligman's helplessness theory", *Tourism Management*, Vol. 33 No. 3, pp. 569-579.
- Lee, M.K., Cheung, C.M. and Chen, Z. (2005), "Acceptance of internet-based learning medium: the role of extrinsic and intrinsic motivation", *Information and Management*, Vol. 42, pp. 1095-1104.
- Li, M. and Cai, L.A. (2012), "The effects of personal values on travel motivation and behavioral intention", *Journal of Travel Research*, Vol. 51 No. 4, pp. 473-487.
- Lin, P.M., Peng, K.-L., Ren, L. and Lin, C.-W. (2019), "Hospitality co-creation with mobility-impaired people", *International Journal of Hospitality Management*, Vol. 77, pp. 492-503.
- Lorenzo-seva, U., Ferrando, P.J. and Chico, E. (2010), "Two SPSS programs for interpreting multiple regression results", *Behavior Research Methods*, Vol. 42 No. 1, pp. 29-35.
- Lyu, S.O. (2017), "Which accessible travel products are people with disabilities willing to pay more? A choice experiment", *Tourism Management*, Vol. 59, pp. 404-412.
- Mckercher, B. and Darcy, S. (2018), "Re-conceptualizing barriers to travel by people with disabilities", *Tourism Management Perspectives*, Vol. 26, pp. 59-66.
- Maccannell, D. (2013), *The Tourist: A New Theory of the Leisure Class*, University of CA Press.
- Michalovic, E., Rocchi, M. and Sweet, S.N. (2019), "Motivation and participation in daily and social activities among adults with spinal cord injury: Applying self-determination theory", *Disability and Health Journal*, Vol. 12 No. 3.
- Milyavskaya, M. and Koestner, R. (2011), "Psychological needs, motivation, and well-being: a test of self-determination theory across multiple domains", *Personality and Individual Differences*, Vol. 50 No. 3, pp. 387-391.
- NANDA International (2012), *Nursing Diagnoses: Definitions and Classification 2012-2014*, Wiley-Blackwell.
- Netemeyer, R.G., Bearden, W.O. and Sharma, S. (2003), *Scaling Procedures: Issues and Applications*, Sage Publications, London.
- Nimon, K., Henson, R.K. and Gates, M.S. (2010), "Revisiting interpretation of canonical correlation analysis: a tutorial and demonstration of canonical commonality analysis", *Multivariate Behavioral Research*, Vol. 45 No. 4, pp. 702-724.
- Nunnally, J.C. and Bernstein, I.H. (1978), *Psychometric Theory*, McGraw-Hill, New York, NY.
- Nyman, E., Westin, K. and Carson, D. (2018), "Tourism destination choice sets for families with wheelchair-bound children", *Tourism Recreation Research*, Vol. 43 No. 1, pp. 26-38.
- Olafsen, A.H., Deci, E.L. and Halvari, H. (2018), "Basic psychological needs and work motivation: a longitudinal test of directionality", *Motivation and Emotion*, Vol. 42 No. 2, pp. 178-189.
- Open doors organization (2015), *Research among Adults with Disabilities: Travel and Hospitality*, Open Doors Organization, Chicago, IL.
- Osborne, J.W. and Waters, E. (2002), "Four assumptions of multiple regression that researchers should always test", *Practical Assessment, Research, and Evaluation*, Vol. 8 No. 2, pp. 1-5.

-
- Pitzer, J. and Skinner, E. (2017), "Predictors of changes in students' motivational resilience over the school year: the roles of teacher support, self-appraisals, and emotional reactivity", *International Journal of Behavioral Development*, Vol. 41 No. 1, pp. 15-29.
- Preacher, K.J. (2015), "Extreme groups designs", in Cautin R.L. and Lilienfeld, S.O. (Eds), *The Encyclopedia of Clinical Psychology*, John Wiley and Sons, Hoboken, NJ.
- Preacher, K.J. and Hayes, A.F. (2008), "Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models", *Behavior Research Methods*, Vol. 40 No. 3, pp. 879-891.
- Ray, N.M. and Ryder, M.E. (2003), "'E abilities' tourism: an exploratory discussion of the travel needs and motivations of the mobility-disabled", *Tourism Management*, Vol. 24 No. 1, pp. 57-72.
- Ryan, R.M. and Powelson, C.L. (1991), "Autonomy and relatedness as fundamental to motivation and education", *The Journal of Experimental Education*, Vol. 60 No. 1, pp. 49-66.
- Sheldon, K.M., Elliot, A.J., Kim, Y. and Kasser, T. (2001), "What is satisfying about satisfying events? Testing 10 candidate psychological needs", *Journal of Personality and Social Psychology*, Vol. 80 No. 2, pp. 325-339.
- Shi, L., Cole, S. and Chancellor, H.C. (2012), "Understanding leisure travel motivations of travelers with acquired mobility impairments", *Tourism Management*, Vol. 33 No. 1, pp. 228-231.
- Tan, W.-K. (2017), "Repeat visitation: a study from the perspective of leisure constraint, tourist experience, destination images, and experiential familiarity", *Journal of Destination Marketing and Management*, Vol. 6, pp. 233-242.
- Tang, Y., Zheng, Q., Qiu, Q. and Fan, X. (2014), "An empirical study on the psychology and behaviors of online tourism consumer participation", *Tourism Tribune*, Vol. 29, pp. 66-74.
- Teixeira, D.S. and Palmeira, A.L. (2016), "Needs satisfaction effect on exercise emotional response: a serial mediation analysis with motivational regulations and exercise intensity", *Motriz: Revista de Educação Física*, Vol. 22, pp. 368-375.
- Thompson, B. (2006), *Foundations of Behavioral Statistics: An Insight-Based Approach*, Guilford Press.
- US Department of Health and Human Services (2015), *US Disability Statistics Report*, CDC.
- Vansteenkiste, M., Aelterman, N., de Muyneck, G.-J., Haerens, L., Patall, E. and Reeve, J. (2018), "Fostering personal meaning and self-relevance: a self-determination theory perspective on internalization", *The Journal of Experimental Education*, Vol. 86 No. 1, pp. 30-49.
- White, C.J. and Thompson, M. (2009), "Self determination theory and the wine club attribute formation process", *Annals of Tourism Research*, Vol. 36 No. 4, pp. 561-586.
- World Health Statistics (2016), *Monitoring Health for the SDGs*, World Health Organization.
- Yau, M.K., Mckercher, B. and Packer, T.L. (2004), "Traveling with a disability: more than an access", *Annals of Tourism Research*, Vol. 31 No. 4, pp. 946-960.
- Zellner, A. (1962), "An efficient method of estimating seemingly unrelated regressions and tests for aggregation bias", *Journal of the American Statistical Association*, Vol. 57 No. 298, pp. 348-368.
- Zhang, Y., Cole, S., Ricci, P. and Gao, J. (2019), "Context-based leisure travel facilitation among people with mobility challenges: a self-determination theory approach", *Journal of Travel Research*, Vol. 58 No. 1, pp. 42-62.

Corresponding author

Ye Zhang can be contacted at: yezhang@fau.edu

For instructions on how to order reprints of this article, please visit our website:

www.emeraldgrouppublishing.com/licensing/reprints.htm

Or contact us for further details: permissions@emeraldinsight.com