

แบบฟอร์มการขอเสนอวาระเข้าที่ประชุม
คณะกรรมการประจำคณะการบริการและการท่องเที่ยว
เรื่อง ขอเสนอผลงานเพื่อรับการพิจารณาขอกำหนดตำแหน่งทางวิชาการ
ราย ดร.สุรวัณ วิชาญกุล

ความเป็นมา

ด้วย ดร.สุรวัณ วิชาญกุล พนักงานมหาวิทยาลัย ตำแหน่งอาจารย์ ตำแหน่งเลขที่ 2638 มีความประสงค์ขอเสนอผลงานเพื่อขอกำหนดตำแหน่งผู้ช่วยศาสตราจารย์ สาขาวิชาบริหารธุรกิจ (6802) อนุสาขาการจัดการการท่องเที่ยวและบริการ (680212) วิธีที่ 1 ตามประกาศ ก.พ.อ. เรื่อง หลักเกณฑ์และวิธีการพิจารณาแต่งตั้งบุคคลให้ดำรงตำแหน่ง ผู้ช่วยศาสตราจารย์ รองศาสตราจารย์ ศาสตราจารย์ พ.ศ.2564, และ พ.ศ.2568

ขั้นตอนที่ได้ดำเนินการไปแล้ว

คณะกรรมการบริการและการท่องเที่ยว ได้แต่งตั้งคณะกรรมการประเมินผลการสอนและดำเนินการประเมินผลการสอนเรียบร้อยแล้ว

ข้อมูลประกอบการพิจารณา

1. เอกสารประกอบการขอตำแหน่งผู้ช่วยศาสตราจารย์
2. ประกาศ ก.พ.อ. เรื่องหลักเกณฑ์และวิธีการพิจารณาแต่งตั้งบุคคลให้ดำรงตำแหน่ง ผู้ช่วยศาสตราจารย์ รองศาสตราจารย์ ศาสตราจารย์ พ.ศ.2564
3. 2. ประกาศ ก.พ.อ. เรื่องหลักเกณฑ์และวิธีการพิจารณาแต่งตั้งบุคคลให้ดำรงตำแหน่ง ผู้ช่วยศาสตราจารย์ รองศาสตราจารย์ ศาสตราจารย์ พ.ศ.2568
4. รายชื่อผู้ทรงคุณวุฒิ

ประเด็นพิจารณา

1. พิจารณารับรองจริยธรรมและจรรยาบรรณทางวิชาการ
2. พิจารณาแต่งตั้งผู้ทรงคุณวุฒิเพื่อประเมินผลงานทางวิชาการและจริยธรรมและจรรยาบรรณทางวิชาการ จำนวน 6 คน สรรอง 2 คน



บันทึกข้อความ

ส่วนงาน สำนักงานบริหาร คณะการบริการและการท่องเที่ยว โทร.6836

ที่ มอ 302.1/69 - 0299

วันที่ 19 มกราคม 2569

เรื่อง เสนอผลงานเพื่อขอกำหนดตำแหน่ง ผู้ช่วยศาสตราจารย์

เรียน คณบดีคณะการบริการและการท่องเที่ยว

ตามที่ข้าพเจ้า นางสาวสุรรัชช์ วิชชุปัญญากุล พนักงานมหาวิทยาลัยตำแหน่งอาจารย์ มีความประสงค์ขอเสนอผลงานเพื่อขอกำหนดตำแหน่ง ผู้ช่วยศาสตราจารย์ สาขาบริหารธุรกิจ (6802) อนุสาขาการจัดการการท่องเที่ยวและบริการ (680212) วิธีที่ 1 ตามประกาศ ก.พ.อ. เรื่องหลักเกณฑ์ และวิธีการพิจารณาแต่งตั้งบุคคลให้ดำรงตำแหน่ง ผู้ช่วยศาสตราจารย์ รองศาสตราจารย์ และศาสตราจารย์ พ.ศ. 2564 และ ประกาศ ก.พ.อ. เรื่องหลักเกณฑ์และวิธีการพิจารณาแต่งตั้งบุคคลให้ดำรงตำแหน่ง ผู้ช่วยศาสตราจารย์ รองศาสตราจารย์ และศาสตราจารย์ (ฉบับที่ 3) พ.ศ. 2568 นั้น

ในการนี้ ข้าพเจ้าได้แนบผลงานเพื่อขอกำหนดตำแหน่ง ตามข้อที่ 1-6 ดังนี้

1. แบบคำขอรับพิจารณากำหนดตำแหน่งทางวิชาการ ก.พ.อ. 03
2. แบบประเมินผลการสอน
3. ผลงานทางวิชาการที่เสนอเพื่อประกอบการพิจารณาตำแหน่งทางวิชาการ กลุ่ม 1 จำนวน 2 เรื่อง
4. แบบแสดงหลักฐานการมีส่วนร่วมในผลงานทางวิชาการ
5. แบบรับรองจริยธรรมและจรรยาบรรณทางวิชาการ
6. หนังสือแจ้งความประสงค์เรื่องการรับรู้ข้อมูลเกี่ยวกับการกำหนดตำแหน่งทางวิชาการ

จึงเรียนมาเพื่อโปรดพิจารณา จะเป็นพระคุณยิ่ง

(นางสาว สุรรัชช์ วิชชุปัญญากุล)

อาจารย์

เรียน คณบดี ฝ่าย วิชาการ/ฝึกอบรม ฯ

เรียนไปเดิมทีแล้ว เห็นควรนำเรื่องไปพิจารณา

คณบดีแผนกป.ก. : ๑

19 ม.ค. 2569

19 ม.ค. 69

ดำเนินการตามแผน

19 ม.ค. 69

เอกสารแนบท้ายประกาศ ก.พ.อ.
เรื่อง หลักเกณฑ์และวิธีการพิจารณาแต่งตั้งบุคคลให้ดำรงตำแหน่ง
ผู้ช่วยศาสตราจารย์ รองศาสตราจารย์ และศาสตราจารย์ (ฉบับที่ 3) พ.ศ. 2568

ส่วนที่ 1 1. แบบคำขอรับการพิจารณากำหนดตำแหน่งทางวิชาการทั่วไป
แบบประวัติส่วนตัวและผลงานทางวิชาการ

แบบประวัติส่วนตัวและผลงานทางวิชาการ
 เพื่อขอดำรงตำแหน่ง ผู้ช่วยศาสตราจารย์
 โดยวิธีที่ 1

ในสาขาวิชา บริหารธุรกิจ (6802) อนุสาขา การจัดการการท่องเที่ยวและบริการ (680212)
 ของ นางสาว สุรรัชช์ วิชชุปัญญากุล
 สังกัด สาขาวิชาการจัดการการท่องเที่ยว
 คณะการบริการและการท่องเที่ยว มหาวิทยาลัยสงขลานครินทร์

1. ประวัติส่วนตัว

1.1 วัน เดือน ปีเกิด 4 ธันวาคม พ.ศ. 2524

1.2 อายุ 44 ปี

1.3 การศึกษาระดับอุดมศึกษา (โปรดระบุชื่อคุณวุฒิเต็มพร้อมสาขาวิชา โดยเรียงจากคุณวุฒิสูงสุดตามลำดับ และกรณีสำเร็จการศึกษาจากต่างประเทศให้ระบุเป็นภาษาอังกฤษ)

	<u>คุณวุฒิ</u>	<u>ปี พ.ศ. ที่จบ</u>	<u>ชื่อสถานศึกษาและประเทศ</u>
1.3.1	Doctor of Hotel and Tourism Management (D.HTM) วิทยานิพนธ์ : Island destinations competitiveness: Subjective well-being perspective	2567	The Hong Kong Polytechnic University, Hong Kong SAR
1.3.2	บริหารธุรกิจมหาบัณฑิต (บธ.ม.) การจัดการการบริการและการท่องเที่ยว วิทยานิพนธ์ : Community participation for sustainable tourism development at Koh Yao Noi, changwat Phang Nga	2549	มหาวิทยาลัยสงขลานครินทร์ ประเทศไทย
1.3.3	บริหารธุรกิจบัณฑิต (บธ.) การจัดการโรงแรม	2559	มหาวิทยาลัยสงขลานครินทร์ ประเทศไทย

2. ประวัติการรับราชการ

2.1 ปัจจุบันดำรงตำแหน่ง อาจารย์
 รับเงินเดือน 45,290 บาท

2.2 ได้รับแต่งตั้งให้ดำรงตำแหน่งอาจารย์ เมื่อวันที่ 1 เดือน พฤศจิกายน พ.ศ. 2553

อายุราชการ 12 ปี 3 เดือน

2.3 ตำแหน่งอื่นๆ

2.3.1 คณะกรรมการนิเทศและประเมินผลสหกิจศึกษาและฝึกปฏิบัติงานของนักศึกษา ประจำปี การศึกษา 2568

2.3.2 คณะกรรมการบริการวิชาการ คณะกรรมการบริการและการท่องเที่ยว ปี 2568

2.3.3 รองคณบดีฝ่ายบริการวิชาการ

2.4 การได้รับเชิญเป็นวิทยากรในที่ประชุมวิชาการระดับนานาชาติ และการได้รับการยกย่องระดับ นานาชาติ อื่นๆ

2.4.1 รับรางวัล APTA Graduate Travel Grant Award 2023 จาก Asia Pacific Tourism Association (APTA) ณ งานประชุมวิชาการระดับนานาชาติ APTA 2023

3. ภาระงานย้อนหลัง 3 ปี (เป็นภาระงานที่เห็นชอบโดยเจ้าสังกัด)

3.1 งานสอน

<u>ระดับ</u>	<u>รายวิชาที่สอน</u>	<u>ชั่วโมง/สัปดาห์/ กลุ่มเรียน</u>	<u>เปิดสอนภาค/ ปีการศึกษา</u>
ปริญญาตรี	001-103 Idea to entrepreneurship (5 sections, Team teaching: 50%)	1 ชั่วโมงบรรยาย	1/2563
ปริญญาตรี	801-103 Introduction to the hospitality and tourism industry (3 Sections)	1 ชั่วโมงบรรยาย	1/2563
ปริญญาตรี	818-342 Incentive travel and special event (2 sections, Team teaching: 50%)	3 ชั่วโมงบรรยาย	1/2563
ปริญญาตรี	001-103 Idea to entrepreneurship (3 sections, Team teaching: 50%)	1 ชั่วโมงบรรยาย	2/2563
ปริญญาตรี	801-103 Introduction to the hospitality and tourism industry (2 Sections)	1 ชั่วโมงบรรยาย	1/2567
ปริญญาตรี	810-021G2B Keys to success (2 Sections, Team teaching: 50%)	2 ชั่วโมงบรรยาย	1/2567
ปริญญาตรี	810-021G2B Keys to success (1 Section, Team teaching: 50%)	2 ชั่วโมงบรรยาย	2/2567
ปริญญาตรี	818-342 Incentive travel and special event (1 section)	3 ชั่วโมงบรรยาย	2/2567
ปริญญาโท	816-515 Contemporary issues and trend in hospitality and tourism industry (Team teaching: 1 class)	3 ชั่วโมงบรรยาย	2/2567
ปริญญาโท	816-531 Minor thesis	18 ชั่วโมงปฏิบัติ	2/2567
ปริญญาตรี	802-110 Introduction to hotel and tourism (4 Sections)	2 ชั่วโมงบรรยาย	1/2568
ปริญญาโท	816-516 Small business sustainable management in hospitality and tourism	3 ชั่วโมงบรรยาย	1/2568

ระดับ	รายวิชาที่สอน	ชั่วโมง/สัปดาห์/ กลุ่มเรียน	เปิดสอนภาค/ ปีการศึกษา
	(Team teaching: 2 classes)		
ปริญญาโท	816-531 Minor thesis	6 ชั่วโมงปฏิบัติ	1/2568
ปริญญาโท	816-541 Thesis	54 ชั่วโมงปฏิบัติ	1/2568
ปริญญาตรี	810-021G2B Keys to success	2 ชั่วโมงบรรยาย	2/2568
	(Team teaching: 50%)		
ปริญญาตรี	801-223 Module: Marketing and consumer insights in a dynamic world	4 ชั่วโมงบรรยาย 2 ชั่วโมงปฏิบัติ	2/2568
	(Team teaching: 50%)		
ปริญญาโท	816-515 Contemporary issues and trend in hospitality and tourism industry	6 ชั่วโมงบรรยาย	2/2568
	(Team teaching: 2 classes)		
ปริญญาโท	816-531 Minor thesis	18 ชั่วโมงปฏิบัติ	2/2568
ปริญญาโท	816-541 Thesis	54 ชั่วโมงปฏิบัติ	2/2568

หมายเหตุ ลาศึกษาต่อ 2 สิงหาคม 2564 – กลับเข้าปฏิบัติงาน 4 มิถุนายน 2567

3.2 งานวิจัย

3.2.1 **โครงการ:** Promoting tourists' sustainable transportation use, walking tour and recycling activities for air pollution minimization at overseas urban tourism destinations (2025)

แหล่งทุน: โครงการทุนเก็บข้อมูลวิจัยแบบเร่งด่วน คณะการบริการและการท่องเที่ยว
FSI6704118 S

สถานะ: ผู้ประพันธ์บรรณกิจ(Corresponding Author)

3.2.2 **โครงการ:** Influence of air pollution-related stressors and environmental-social responsibility on destination brand power (Chinese vs. Korean tourists) (2025)

แหล่งทุน: โครงการทุนเก็บข้อมูลวิจัยแบบเร่งด่วน คณะการบริการและการท่องเที่ยว
FSI6704118 S

สถานะ: ผู้ร่วมวิจัย (Co-investigator)

3.2.3 **โครงการ:** Exploring traveller willingness to shift towards air pollution-free destinations: developing the multiple configurations of push, pull, and mooring factors (2025)

แหล่งทุน: โครงการ Reinventing University

สถานะ: ผู้ร่วมวิจัย (Co-investigator)

3.2.4 **โครงการ:** Promoting individual and organization-oriented sustainable behaviors among employees in tourism and hospitality (2024)

แหล่งทุน: โครงการ Reinventing University

สถานะ: ผู้ร่วมวิจัย (Co-investigator)

3.2.5 **โครงการ:** Social media sites and nightlife tourism: an empirical study of tourist decision-making on nightlife entertainment consumption (2023)

แหล่งทุน: -

สถานะ: ผู้ร่วมวิจัย (Co-investigator)

3.2.6 โครงการ: Green rush in Phuket: big-data evidence of cannabis commercialization in a tourism-centric area (2023)

แหล่งทุน: -

สถานะ: ผู้ร่วมวิจัย (Co-investigator)

3.3 งานบริการวิชาการ

3.3.1 Moderator งานประชุมวิชาการ The 3rd Global ESG Conference 2025

3.3.2 Moderator งานประชุมวิชาการ The 20th Asia Pacific Forum for Graduate Students

Research in Tourism (APF) 2024

3.3.3 Reviewer ประเมินบทความวิจัย Journal of Travel & Tourism Marketing

3.3.4 ผู้ทรงคุณวุฒิประเมินแบบสอบถามนักศึกษาปริญญาเอก สถาบันบัณฑิตพัฒนบริหารศาสตร์ (NIDA)

3.3.5 วิทยากรบรรยาย Business Psychology ณ คณะวิทยาการจัดการ มหาวิทยาลัยราชภัฏภูเก็ต

3.3.6 วิทยากรบรรยายเชิงปฏิบัติการการใช้ภาษาไทย สำหรับนักศึกษาแลกเปลี่ยน ณ คณะการบริการและการท่องเที่ยว มหาวิทยาลัยสงขลานครินทร์ วิทยาเขตภูเก็ต

3.4 งานบริหาร -

3.5 งานอื่นๆ ที่เกี่ยวข้อง

3.5.1 ประธานสัมพันธ์หลักสูตร คณะการบริการและการท่องเที่ยว

3.5.2 กรรมการประเมินคุณภาพภายในระดับหลักสูตร ตามระบบ CUPT QA ปีการศึกษา 2567 (หลักสูตรศิลปศาสตร สาขาวิชาธุรกิจระหว่างประเทศ: จีน และ หลักสูตรรัฐประศาสนศาสตร์)

3.5.3 กรรมการประเมินคุณภาพเนื้อหาสื่อการเรียนรู้ออนไลน์ PSU MOOC ประจำปี 2568

4. ผลงานทางวิชาการ

4.1 ผลงานทางวิชาการที่เสนอเพื่อประกอบการพิจารณาตำแหน่งผู้ช่วยศาสตราจารย์

4.1.1 งานวิจัย

4.1.1.1 Han, H., Sangkaew, N., Cheng, X., Au, W. C. W., Tsang, K. F. N., & Wichupankul, S. (2025). Promoting tourists' sustainable transportation use, walking tour and recycling activities for air pollution minimization at overseas urban tourism destinations. Journal of Hospitality and Tourism Insights. 8(9), 3557–3583, <https://doi.org/10.1108/JHTI-03-2025-0336>

ตีพิมพ์ในวารสาร Journal of Hospitality and Tourism Insights

ฐานข้อมูล Scopus (Tourism, Leisure and Hospitality Management (Q1))

มี Impact Factor ปี 2024 เท่ากับ 4.8 Citation = 5,416 Quartile ปี 2025 = Q1

Category = Tourism, Leisure and Hospitality Management SJR ปี 2024 = 1.134

สถานะผู้ขอในผลงาน คือ ผู้ประพันธ์บรรณกิจ (Corresponding Author)

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ผลงานวิจัยนี้เคยใช้สำหรับการพิจารณาขอกำหนดตำแหน่งผู้ช่วยศาสตราจารย์และ/หรือตำแหน่งรองศาสตราจารย์มาแล้วหรือไม่

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ขอรับรองว่าข้อความดังกล่าวข้างต้นเป็นความจริงทุกประการ

ลงชื่อ..........เจ้าของประวัติ

(นางสาว สุรรัช วิชชุปัญญากุล)

ตำแหน่ง อาจารย์

วันที่ 19 เดือน มกราคม พ.ศ. 2569

ส่วนที่ 2 : แบบประเมินคุณสมบัติโดยผู้บังคับบัญชา

แบบประเมินแต่งตั้งให้ดำรงตำแหน่งผู้ช่วยศาสตราจารย์
ในสาขาวิชาบริหารธุรกิจ (6802) อนุสาขาการจัดการการท่องเที่ยวและบริการ (680212)
โดยวิธีที่ 1

ของ นางสาว สุรรัชช์ วิชชุปัญญากุล
สังกัด สาขาวิชาการจัดการการท่องเที่ยว
คณะกรรมการบริการและการท่องเที่ยว มหาวิทยาลัยสงขลานครินทร์

ได้ตรวจสอบคุณสมบัติเฉพาะสำหรับตำแหน่งผู้ช่วยศาสตราจารย์ แล้วเห็นว่า นางสาว สุรรัชช์
วิชชุปัญญากุล เป็นผู้มีความสมบัติ ครบถ้วน ตามหลักเกณฑ์ที่ ก.พ.อ. กำหนด

ลงชื่อ



(รองศาสตราจารย์ ดร.กุลดา เพ็ชรวรรณ)

ตำแหน่ง

หัวหน้าภาควิชาการจัดการการท่องเที่ยว

วันที่ 19

เดือน ๖.๑

พ.ศ. 2569

ความเห็นผู้บังคับบัญชาระดับคณบดีหรือเทียบเท่า

ได้พิจารณาแล้วเห็นว่า นางสาว สุรรัชช์ วิชชุปัญญากุล เป็นผู้มีความสมบัติ เข้าข่าย ที่จะได้รับการ
แต่งตั้งให้ดำรงตำแหน่ง ผู้ช่วยศาสตราจารย์

ลงชื่อ



(รองศาสตราจารย์ ดร.พรพิษณุ พรหมศิระพัลลภ)

ตำแหน่ง คณบดีคณะกรรมการบริการและการท่องเที่ยว

วันที่ 19

เดือน ๖.๑

พ.ศ. 2569

ส่วนที่ ๓ แบบประเมินผลการสอน

คณะกรรมการเพื่อประเมินผลการสอน ในการประชุมครั้งที่ 1/2568 เมื่อวันที่ 12 พฤศจิกายน 2568 และครั้งที่ 1/2569 เมื่อวันที่ 16 มกราคม 2569 ซึ่งได้รับมอบอำนาจจาก คณะกรรมการพิจารณาตำแหน่งทางวิชาการ มหาวิทยาลัยสงขลานครินทร์ ได้ประเมินผลการสอน รหัสวิชา 802-021 รายวิชา Introduction to Hotel and Tourism และ รหัสวิชา 810-021G2B รายวิชา Keys to Success ของ นางสาวสุรรัช วิชชุปัญญาแล้วเห็นว่าบุคคลดังกล่าวเป็นผู้มีความชำนาญ ในการสอน มีคุณภาพ อยู่ในหลักเกณฑ์และวิธีการตามที่สภามหาวิทยาลัยกำหนด

ลงชื่อ.....

(รองศาสตราจารย์ ดร.พรพิษณุ พรหมศิวัพล)

ตำแหน่ง ประธานคณะกรรมการเพื่อประเมินผลการสอน

วันที่...19...เดือน...ย.ค.....พ.ศ. 2569

Promoting tourists' sustainable transportation use, walking tour and recycling activities for air pollution minimization at overseas urban tourism destinations

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Abstract

Purpose – This study aims to examine the factors driving tourists' engagement in eco-friendly activities to minimize air pollution in urban destinations. It also explores cross-national differences in pollution reduction behaviour between Chinese and Korean tourists to inform tailored sustainable tourism strategies.

Design/methodology/approach – This study employs a mixed-method approach, integrating user-generated content analysis from TripAdvisor's Asia forums to highlight experiences and behaviours in polluted destinations with structural equation modelling of survey data to examine the relationships among loyalty, moral norms, attitude and eco-friendly activities.

Findings – "Air pollution" and "air quality" emerged as the most prominent terms in TripAdvisor's Asia forums, reflecting the need for pollution reduction. Chinese tourists are more responsive to ascribed responsibility, whereas Korean tourists are more influenced by problem awareness and social norms.

Practical implications – The findings provide strategic insights for tourism managers to promote tourists' engagement in eco-friendly activities. Awareness campaigns and community initiatives resonate with Korean tourists, while Chinese tourists require strategies that emphasize personal contributions to pollution reduction.

Originality/value – This study offers a novel integration of norm activation theory, four-stage loyalty theory and the theory of reasoned action to examine eco-friendly behaviours, effectively bridging environmental psychology and tourism studies. It provides fresh insights into culturally rooted drivers of sustainable



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behaviour by revealing cross-national differences between Chinese and Korean tourists in air-polluted urban destinations.

Keywords Eco-friendly travel, Air pollution mitigation, Environmental responsibility, Cross-national comparison, Low-carbon tourism, Tourist sustainable behaviour

Paper type Research paper

Introduction

The interplay between air pollution and tourism development has become a focal point of scholarly inquiry as it leads to a vicious cycle of development and pollution. On one hand, Rico *et al.* (2019) showed that the global tourism industry has emerged the world's fifth-largest polluter, accounting for approximately 10% of greenhouse gas emissions worldwide (Lenzen *et al.*, 2018). Many tourist activities, such as passenger transportation and unsustainable behaviours, require a significant amount of electricity generated from non-renewable resources create a certain amount of pollution (Wang and Wu, 2022). Additionally, a 1% point rise in air pollution index leads to a 1.25% reduction of the total tourist visit in China (Zhang *et al.*, 2020), particularly in urban regions (e.g. China and Southeast Asia regions) where air pollution presents a significant challenge and poses significant travel constraints (Eusébio *et al.*, 2023). These findings illustrate how tourism both contributes to air pollution and suffers from its consequences, underscoring the urgent need to mitigate tourism-induced air quality issues.

Unlike other contexts where air pollution is more severe during the manufacturing stage, in tourism, tourists' eco-unfriendly consumptions and behaviours during trips contribute most to air pollution (Eusébio *et al.*, 2023). Promoting sustainable behaviour among tourists may help mitigate air pollution. Therefore, destination planners, policy makers, and scholars have shown growing interest in promoting active transportation, such as walking and cycling, due to its positive impact on both environment and individual health (Kim *et al.*, 2023). Additionally, responsible waste disposal by tourists not only reduces environmental issues but also enhances the efficiency of recycling reusable materials (Gong *et al.*, 2024). Such sustainable behaviours are induced by tourists' perception of air pollution (Jokar *et al.*, 2020). Specifically, poor air quality has been found to increase tourists' engagement in environmental protection such as using eco-friendly transportation and recycling (Eusébio *et al.*, 2023; Gu *et al.*, 2015).

However, many tourists still remain reluctant to voluntarily adopt pollution-reduction behaviours during their travels, meaning that the potential for tourism to self-mitigate its environmental impact is far from fully realized. This gap between the need for action and tourists' reluctance to engage in eco-friendly practices highlights the necessity of understanding the key drivers that can motivate tourists to use sustainable transportation, join walking tours, and practice recycling at destinations. Identifying these drivers is crucial for developing effective air pollution mitigation strategies in urban tourism destinations (Au *et al.*, 2024).

As a shared set of customs, values, norms, beliefs, and habits (Hall and Morley, 2018), culture has been recognized as a critical factor in shaping tourists' eco-friendly behaviours (Chan *et al.*, 2022). In the context of tourism, nationality reflects of cultural identity, with distinct cultural traits within the same nationality influencing tourists' behaviour and decision making (Melubo *et al.*, 2024). A meta-analysis of 95 published studies by Hansen *et al.* (2024) revealed that the driver effects on tourists' eco-friendly behaviours varied extensively across dimensions of national culture. For instance, Korean tourists were found to exhibit more positive attitudes towards eco-friendly practices compared to British and Australian tourists (Kang and Moscardo, 2006). Chinese tourists tend to be less sensitive to air pollution, shaped by their experiences with rapid industrialization, whereas Korean tourists have higher environmental expectations, influenced by stricter environmental regulations (Zhang, 2024). In this case, tourists are less likely to consider air quality when selecting sustainable tourism options if air pollution is not a significant concern in their home countries.

Despite growing interest in sustainable tourism, most tourism studies on air pollution mitigation have been conducted within single-country contexts, such as China (Gao *et al.*, 2023a), the United States (Zhang *et al.*, 2020) and Portugal (Rodrigues and Loureiro, 2024).

As a result, it remains largely unclear how nationality-based cultural differences shape tourists' engagement in eco-friendly activities to minimize air pollution. This represents a notable gap in the literature that warrants further investigation (Melubo *et al.*, 2024). Consequently, the extent to which the difference in nationality influences tourists' eco-friendly activities for air pollution minimization remains an area requiring further investigation.

To address the above problem and gap, this study aims to reveal the drivers of tourists' eco-friendly activities for air pollution minimization at urban tourism destinations (sustainable transportation use, walking tours, and recycling activities). In particular, it attempts to (1) provide a more comprehensive understanding regarding the formation of tourists' air-pollution reduction activities by merging three study theories in environmental behaviour and socio-psychology (norm activation theory, four-stage loyalty theory, and theory of reasoned action), (2) examine intricate associations among the factors of these theories, (3) unearth comparative importance of research variables in determining tourists' eco-friendly activities for air pollution minimization, and (4) uncover the cross-national difference on the hypothesized relationships between Chinese and Korean tourists.

This study is expected to contribute to the tourism literature by bridging environmental psychology and tourism behaviour research to explain tourists' eco-friendly actions. It provides a novel integrated model of tourist pro-environmental behaviour by combining insights from norm activation theory, four-stage loyalty theory, and the theory of reasoned action, offering empirical evidence on which factors most strongly encourage sustainable practices. Additionally, by comparing Chinese and Korean tourists, the research yields new cross-cultural insights into sustainable tourism behaviour in the context of air pollution. These contributions help to fill the identified gaps and offer practical guidance for destination managers seeking to promote pollution-minimizing practices among international visitors.

Literature review

Theoretical background

Various theories from the environmental psychology domain have been employed to explain tourists' eco-friendly behaviours (Berenguer, 2010). Among these, Schwartz's (1977) norm activation theory, hereafter NAT, is considered the most dominant in the context of eco-friendly tourism development (Nguyen *et al.*, 2024). This theory posits that one's eco-friendly behaviour is a function of personal norms, which are prompted by individual's awareness of the problem and their ascribed responsibility (Han *et al.*, 2019). Although this NAT has been extensively applied in studies on pro-environmental behaviour, numerous scholars have expressed doubts about its sufficiency, calling for the expansion or integration of theories to provide a more comprehensive explanation of individuals' pro-environmental intentions and behaviours (Han, 2015; Han *et al.*, 2019).

In addition to NAT, theory of reasoned action (TRA) (Fishbein and Ajzen, 1975) has been employed to explain eco-friendly behaviour in hospitality and tourism studies (Han, 2014; Han *et al.*, 2023). TRA, composing of attitudes toward behaviour and subjective norms, posits that behaviour is guided by intention which reflects an individual's willingness to act (Ajzen, 1991). Attitudes and subjective norms have been widely acknowledged as essential factors in explaining individuals' eco-friendly behaviours (Han *et al.*, 2023; Li and Wu, 2020). Although such behaviours are often driven by a sense of shared responsibility, as environmental issues typically demand collective action, individual are more likely to adopt such behaviours when they perceive that others are also participating (Li and Wu, 2020).

While TRA highlights intention as a key predictor of behaviour, studies have shown that intention alone may not consistently lead to action, particularly in the context of sustainable behaviour (Dolnicar and Demeter, 2024; Juvan and Dolnicar, 2016). The distinction between NAT and TRA is in their approaches to understand pro-environmental behaviours. NAT appeals more to intrinsic motivations while TRA is involved with rational evaluations (Chi *et al.*, 2023). NAT emphasizes moral norms arising from an individual's awareness of

environmental consequences, leading to sense of responsibility (Confente and Scarpi, 2021). In contrast, TRA posits that behavioural intentions are predominantly shaped, within a boarder cognitive evaluation of expected outcomes, by attitudes and subjective norms (González-Rodríguez and Tussyadiah, 2022). In this study, social norm within the TRA emphasized travellers' perception of how others expect them to behave in relation to reducing air pollution while travelling. Moral norm within the NAT referred to a personal moral obligation to travel in an eco-friendly manner to help reduce air pollution. Combining the social psychological theories has often provided a greater accountability for pro-environmental behaviour (Han *et al.*, 2023). Hence, prior studies have been integrated TRA and NAT into conceptual framework to fully consider individuals' norms and attitudes when explaining tourists' eco-friendly behaviours (Han, 2014; Han *et al.*, 2023).

Despite these innovative efforts of the integration, norm activation theory and the theory of reasoned action tend to explain individuals' eco-friendly behaviours primarily from the tourists' perspective, neglecting the role of the destination in shaping such behaviours. Specifically, tourists are more likely to participate in eco-friendly practices if they own property at the destination (Chubchuwong *et al.*, 2015), as relational factor may trigger such behaviour. This suggests that the relationship between tourists and the destination could be an important predictor of eco-friendly behaviours, as tourists' denial of responsibility for long-term outcomes like air pollution in the destination is a commonly cited justification for their eco-unfriendly actions. Consequently, in addition to established theories, this study considered this tourist-destination relationship as a potential determinant of tourists' eco-friendly activities for air pollution minimization, drawing on the four-stage loyalty theory (Oliver, 1997). Therefore, the four-stage loyalty theory, norm activation theory, and theory of reasoned action were incorporated into the conceptual framework of this current study to broaden the predictors of pro-environmental behaviour in urban tourism destinations facing air pollution challenges.

Air pollution and urban tourism destinations

Numerous popular urban tourism destinations have been heavily burdened due to air pollution indicators, particularly seasonal haze (Yang *et al.*, 2022), often intensified by high-density traffic and increased tourist inflow. Urban tourism destinations in Asia have documented significant seasonal variation in air quality, with PM 2.5 levels frequently exceeding safe thresholds in Beijing, Shanghai, Seoul, Bangkok, Hong Kong, and Tokyo (Euromonitor, 2023; IQAir, 2023). Given that air pollution is a key indicator for sustainable development (Ahmed *et al.*, 2024; Esawe *et al.*, 2024) and a significant factor influencing shifts in travel behaviour (Gao *et al.*, 2023a), previous studies have shown variations in responses to pollution across demographic groups and trip durations, with further differences observed between cities and countries (Kim *et al.*, 2024). Well-established urban tourism cities are vulnerable to air pollution challenges. Furthermore, tourists in collectivist countries with lower levels of air pollution are often more sensitive to the effects of air pollution when visiting impacted destinations (Yang *et al.*, 2022).

Adopting eco-friendly tourist behaviours has emerged as a practical approach to address these challenges. Encouraging sustainable transportation, such as public transit, and promoting walking tours can significantly reduce reliance on high-emission vehicles, easing traffic congestion and lowering pollution levels (Ahmad and Harun, 2024; Yeap and Liow, 2024). Additionally, recycling initiatives at tourism hotspots also contribute to a cleaner urban environment by minimizing waste accumulation (Tian, 2023). However, it is essential to recognize that the effectiveness of these eco-friendly practices depends on available infrastructure, which varies across urban areas and may pose challenges to fully realizing these benefits (Akomolafe *et al.*, 2024). Engaging the community and raising awareness are also vital to fostering a collective commitment to sustainable practices and supporting cleaner and healthier urban tourism environments (Gao *et al.*, 2023b).

Norm activation theory and environmental responsibility

Norm activation theory (Schwartz, 1977), hereafter NAT, offers a framework for examining how individuals' environmental behaviours are influenced by their moral norms. In tourism, this model has proven effective in explaining eco-friendly behaviours, indicating that when tourists are conscious of their environmental footprint, they feel morally compelled to mitigate it through sustainable practices (Hwang *et al.*, 2024). For instance, evidence shows that tourists who perceive environmental degradation, such as poor air quality, are more likely to make sustainable travel choices, such as using green transportation options (Eusébio *et al.*, 2023; Jokar *et al.*, 2020). Prior research suggests that as tourists' problem awareness of pollution increases, their ascribed responsibility to the environment also grows (Bamberg and Möser, 2007; Han, 2015), reinforcing their moral norms to act in an eco-friendly manner (Syahri, 2016). This theoretical pathway is crucial for understanding the psychological drivers behind tourists' commitment to reducing air pollution, particularly in urban tourism destinations, where visible pollution heightens their sense of environmental duty. Hence, based on these aspects, the following hypotheses are proposed:

H1. Problem awareness positively affects ascribed responsibility.

H2. Ascribed responsibility positively affects moral norm.

Moral norms as drivers of eco-friendly tourist behaviours

Moral norms are crucial drivers of environmentally responsible behaviours in tourism, evoking a sense of obligation and motivating actions aligned with ethical beliefs about environmental conservation (Harland *et al.*, 2007; Jhawar *et al.*, 2023). These norms compel tourists to opt for eco-friendly behaviours, including public transit or cycling, as they seek to minimize their environmental footprint (Hwang and Lyu, 2020; Kim and Hall, 2022). Additionally, moral obligations can directly influence specific actions at the destination, such as choosing sustainable transport options, participating in walking tours, and engaging in recycling activities (Park and Ha, 2014). These eco-friendly behaviours not only align with tourists' moral values but also reinforce their commitment to eco-friendly travel, promoting lower-impact exploration methods in urban areas (Assaker, 2025; Ya and Yan, 2024). Recycling behaviours among tourists are similarly influenced by moral norms, where both a sense of duty and social influence encourage responsible waste management (Gao *et al.*, 2023b), particularly in urban and tourism-intensive settings. However, a gap often exists between tourists' intention and their actual behaviour. While moral norms can serve as strong motivators, practical considerations such as convenience may hinder the implementation of eco-friendly actions, highlighting the complexity of translating moral responsibility into actual behaviours in tourism context (Jhawar *et al.*, 2023). When sustainable practices conflict with tourists' habitual routines, individuals are more likely to reverse to automatic behaviours rather than engage in pro-environmental actions (Ajzen, 1991; MacInnes *et al.*, 2022). Furthermore, attitudes and beliefs do not always result in behavioural change through cognitive processing alone. Specifically, many sustainable behaviours require significant effort, and tourists are often reluctant to compromise their leisure time to engage in cognitively demanding environmental actions—even when presented with informative pro-environmental message (Dolnicar and Demeter, 2024). Given the diversity in the forms and motivations of sustainable behaviours, this study categorized them into three dimensions—sustainable transportation usage, walking tour, and recycling activities—in order to more comprehensively examine the influence of moral norms on different behavioural pathways. Based on these considerations and the unique context of this study, the following hypotheses were proposed:

H3. Moral norm positively affects sustainable transportation usage.

H4. Moral norm positively affects walking tour.

H5. Moral norm positively affects recycling activities.

Four-stage loyalty theory and destination loyalty

The four-stage loyalty theory conceptualizes loyalty as a dynamic process that evolves through four progressive stages: cognitive, affective, conative, and action. Each stage represents a deeper level of commitment and a higher likelihood of engaging in supportive behaviours (1999; Oliver, 2014). Empirical study regarding convention industry supported the positive relationship between four-stage loyalty and moral norms, where affective loyalty reinforces conative loyalty, and that conative loyalty can contribute to the action loyalty, while moral norms positively affect conative loyalty and action loyalty of environmentally responsible options (Han and Hwang, 2015). The four-stage loyalty process begins with cognitive loyalty, which emerges when tourists develop favourable perceptions of a destination based on positive experiences, which sets a foundation for later stages (Gunawan, 2018). As tourists develop emotional connections, they enter the affective loyalty phase, strengthening their satisfaction and attachment to the destination, and enhancing their intentions to return or recommend to others (Yoon and Uysal, 2005). This emotional bond fosters conative loyalty, where tourists express a strong desire to return, reflecting a behavioural commitment to the destination (Kim and Kim, 2015). Finally, action loyalty manifests as actual behaviours aligned with supportive practices, such as advocating for sustainable tourism initiatives (Matthews *et al.*, 2014).

The four-stage loyalty framework is widely adopted in tourism research due to its comprehensive nature and flexibility, allowing for further refinement and theoretical extension (Evanschitzky and Wunderlich, 2006). Building on this foundation, this study examines the positive influence of conative destination loyalty on moral norm. While prior research has identified moral norms as predictors of conative loyalty—such as in the context of convention tourism (Han and Hwang, 2015), intention to stay at eco-friendly hotel (Fauzi *et al.*, 2024), and revisit intention toward smart destination (Nieves-Pavón *et al.*, 2024), the reciprocal relationship remains underexplored. Investigating this interplay offers valuable insights into how loyalty formation may also shape sustainable behaviours. Given the adaptable nature of the four-stage loyalty theory, the following hypotheses were proposed:

H6. Cognitive destination loyalty positively affects affective destination loyalty.

H7. Affective destination loyalty positively affects conative destination loyalty.

H8. Conative destination loyalty positively affects moral norm.

Theory of reasoned action and environmental attitudes

The theory of reasoned action (TRA) posits that individual attitudes and perceived social norms play a central role in shaping behavioural intentions, which subsequently drive actual behaviour (Ajzen, 1991; Fishbein and Ajzen, 1975). TRA provides valuable insights into why tourists engage in eco-friendly behaviours, such as reducing waste, conserving resources, and choosing sustainable transportation (He *et al.*, 2024; Lam and Hsu, 2004). Research consistently demonstrates that tourists' attitudes are closely linked to subjective norms and strongly predict their intention (Luong, 2024; Wasaya *et al.*, 2024). For instance, tourists who value eco-friendly practices are inclined to adopt such behaviours as using public transport or minimizing waste while travelling (Ng, 2024; Oduro-Appiah *et al.*, 2024). Moreover, social norms—perceived expectations from friends, family, and society—enhance the likelihood of these pro-environmental intentions being translated into action (Ng, 2024). In addition, social norms surrounding eco-friendly behaviours reinforce moral norms, enhancing tourists' commitment to environmentally responsible actions (Anand and Sharma, 2023). However, while social norms encourage sustainability, individual attitudes often have a more direct influence on guiding pro-environmental behaviours (Mehmood and Khan, 2023). This nuanced understanding of TRA in environmental-concerned tourism underscores the dynamic interplay of attitudes, social norms, and moral norms, highlighting the need to examine

sustainable tourism behaviours across diverse contexts. Based on these aspects, the following hypotheses are proposed:

H9. Attitude toward air-pollution reduction activities positively affects moral norm.

H10. Social norm positively affects moral norm.

Cross-national comparisons in eco-friendly tourist behaviours

Cultural and societal factors shape tourists' eco-friendly behaviours, with notable differences observed across national contexts. Cross-national studies indicate that tourists demonstrate different levels of environmental awareness and adherence to social norms, both of which impact their eco-friendly behaviours (Kang and Moscardo, 2006). Chinese tourists, accustomed to rapid industrialization, prioritize economic development and infrastructure over air quality (Junaid *et al.*, 2024), making pollution levels less influential in their destination choices (Zhang, 2024). In contrast, Korean tourists, shaped by stricter environmental regulations, are more sensitive to air quality, especially in urban areas, where it strongly influences their travel decisions (Chen *et al.*, 2023). Understanding these distinctions is therefore essential for tailoring tourism strategies to diverse audiences. Nonetheless, some studies suggest that core environmental values—such as conservation and sustainability—may hold a universal appeal across socio-cultural backgrounds, hinting at the potential for a more global approach to fostering eco-friendly tourism behaviours (Mayerl and Best, 2019). Examining these nuances is essential, as it provides insight into how cross-national differences influence their environmental behaviours. Based on the above discussion, this study proposes the following hypothesis:

H11a–j. The proposed linkages among study variables are significantly different between Chinese tourists and Korean tourists.

Combining norm activation theory, four-stage loyalty theory, and the theory of reasoned action offers a comprehensive framework to explain eco-friendly tourist behaviours. While NAT establishes a foundation for responsibility, loyalty theory and TRA enrich the understanding of behavioural intentions shaped by loyalty and social influences. This integration is critical for exploring tourists' eco-friendly behaviours across cultural backgrounds, addressing gaps in the current literature, and advancing theory in sustainable tourism. Moreover, previous studies have provided substantial evidence supporting the direct effects of psychological variables such as ascribed responsibility, attitude, and social norm on pro-environmental behaviour (e.g. Guo *et al.*, 2019; Han *et al.*, 2019). Therefore, this study further focuses on the mediating role of moral norm to deepen the understanding of the psychological pathway through which tourists engage in sustainable behaviours at pollution-affected destinations. The proposed research framework is illustrated in Figure 1. The proposed research framework is illustrated in Figure 1.

Methodology

The study employed a mixed-methods approach combining a quantitative survey and qualitative user-generated content (UGC) analysis to investigate tourists' sustainable behaviour for air pollution minimization in urban tourism destinations. Two culturally distinct groups (Chinese and Korean tourists) were selected to enable cross-national comparison. These groups represent significant outbound tourism markets and have cultural orientations and risk perceptions related to air quality (Chen *et al.*, 2023; Jung *et al.*, 2022; Yu and Ko, 2012). Although China and Korea share regional proximity, their tourists differ in how they perceive and respond to environmental threats (Han *et al.*, 2025). Korean travellers tend to be more sensitive to air pollution and weigh it heavily in travel decisions, whereas Chinese tourists often prioritize development and infrastructure, viewing air pollution as less critical in

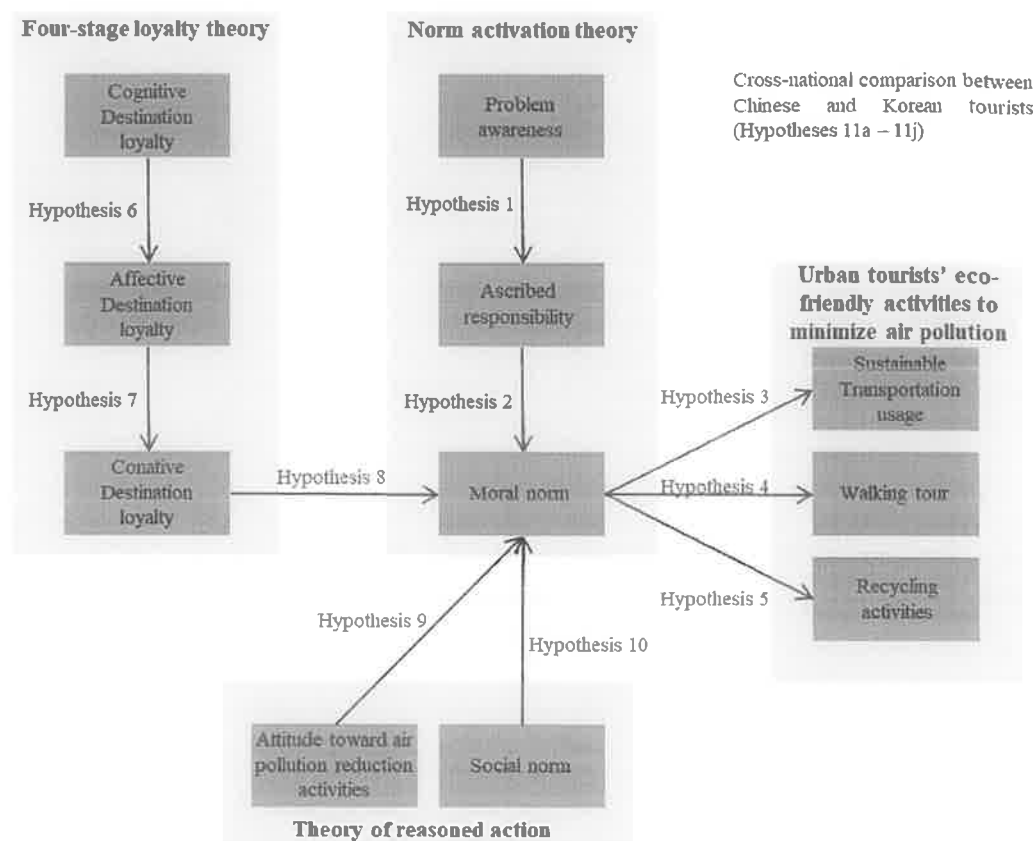


Figure 1. Proposed conceptual framework (Chinese tourists vs. Korean tourists). **Source:** Authors' own work

destination selection (Akram *et al.*, 2024; Sun *et al.*, 2023). These contrasting cultural tendencies offer valuable insights into cross-cultural sustainability behaviours.

User-generated content (UGC) analysis

Qualitative insights were drawn from TripAdvisor forums to supplement the survey data, focusing on tourist discourse around air pollution in Asian destinations between January 2019 and February 2024. Posts were selected using keyword-based search terms including “pollution” and “air quality”, and filtered for relevance and destination focus. The final dataset included 452 forum posts covering major cities such as Bangkok, Hong Kong, Hanoi, and Tokyo.

Text preprocessing was performed using the KNIME Analytics Platform well-regarded in tourism research for text mining and has been previously applied in studies of online reviews (Sincharoenkul and Sangkaew, 2023). The online review analysis process, illustrated in Figure 2, involving standard cleaning procedures such as punctuation removal, lowercasing, stop words filtering, and stemming (Willett, 2006). This dataset captures travellers' reflections on air pollution and its influence on their travel experiences and decision-making (Sangkaew *et al.*, 2023; Yan *et al.*, 2022). A two-step analysis was followed, first, a word frequency analysis was conducted to generate a visual word cloud. Second, a thematic coding procedure was applied, classifying terms based on constructs from NAT, TRA, and Loyalty Theory.

To ensure rigour, two independent coders manually analysed a sample of 30% of the posts, achieving a Cohen's Kappa coefficient of 0.68, indicating substantial intercoder reliability (Landis and Koch, 1977). While automated sentiment analysis and machine learning were

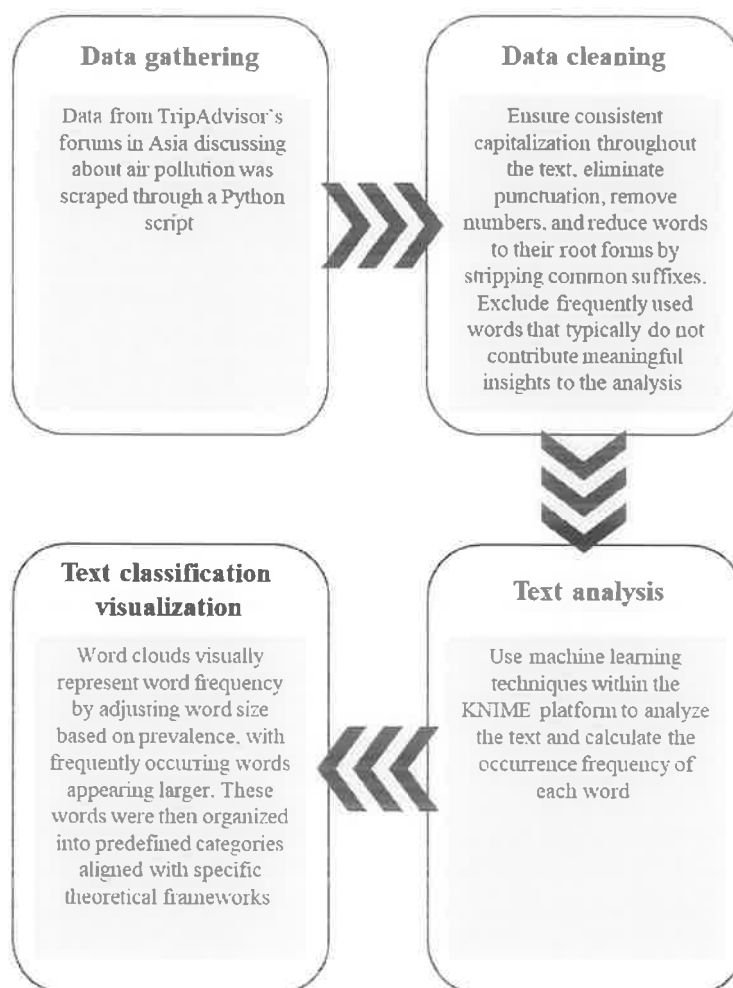


Figure 2. Online review analysis process. **Source:** Authors' own work

considered, manual thematic coding was prioritized to align the qualitative findings closely with the study's theoretical framework. This qualitative dimension enriched the understanding of how air pollution affects tourists' experiences and their behavioural intentions in destinations.

Quantitative survey

A structured online survey was administered in June 2024 through two reputable online panel providers: Credamo for Mandarin-speaking respondents in China and INVITE for Korean participants. The study applied purposive quota-based sampling to ensure diverse demographics and targeted individuals who had travelled internationally to urban destinations with known air pollution issues in the last five years. The cities included in this study were Bangkok, Dubai, Singapore, Kuala Lumpur, Tokyo, Abu Dhabi, Osaka, Phuket, Bali, Hong Kong, Ho Chi Minh City, Chiang Mai, Hanoi, Beijing, Shanghai, Shenzhen, Taipei, and Guangzhou. These locations were selected based on their popularity among tourists and notable air pollution levels, according to recent tourism and air quality reports (Euromonitor, 2023; IQAir, 2023). To minimize national bias, Chinese cities were excluded from the Chinese survey and Seoul was excluded from the Korean survey. Pre-screening questions ensured respondents met the inclusion criteria.

Confirmatory factor analysis (CFA) validated the reliability, convergent validity, and discriminant validity of the constructs. Given the reflective nature of constructs and the theoretical model's complexity, covariance-based structural equation modelling (CB-SEM) was employed to test the hypothesized relationships.

Online review analysis

In this study, NAT is applied to explain the relationship between awareness of environmental problem and ascribed responsibility in triggering moral norms that drive eco-friendly behaviours. Tourists expressed awareness about environmental issues, with frequent mentions of terms such as “Pollution” (560 mentions), “Air quality” (113 mentions),

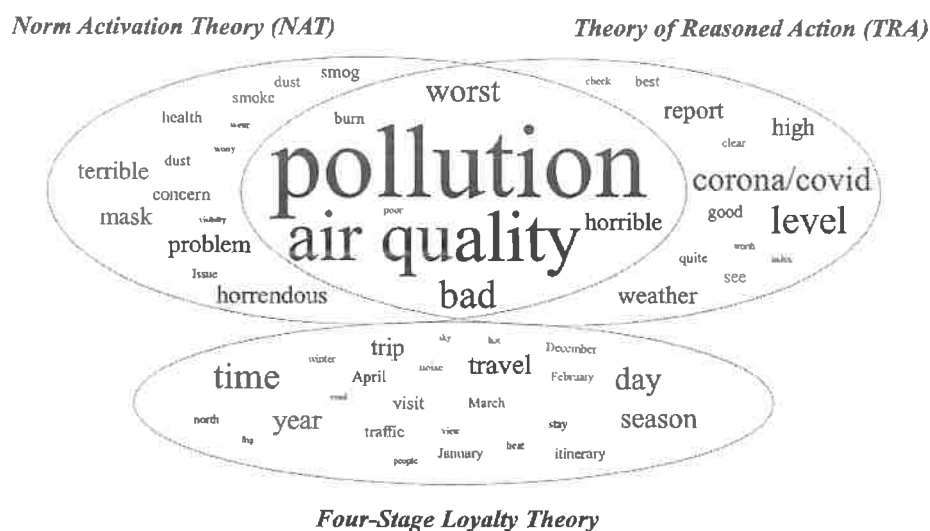


Figure 3. Text classification of air pollution experience in selected Asian cities. **Source:** Authors' own work

and “Health” (12 mentions), emphasizing awareness of air quality’s physical impact on well-being. Related words such as “Dust”, “Smoke”, and “Smog” further reveal tourists’ sensitivity to pollution, leading to precautionary behaviours—wearing “Masks” (30 mentions). This sense of responsibility, reflected in terms such as “Concern” (21 mentions) and “Worry” (9 mentions), highlights NAT’s role in motivating tourists to engage in environmentally conscious behaviours.

TRA offers insights into how attitudes and social norms influence behavioural intentions regarding pollution. Words such as “Best” (17 mentions) and “Clear” (9 mentions) reflect evaluative attitudes that shape travel choices. “Check” (10 mentions), and “Report” (19 mentions) and “Index” (7 mentions), show how perceptions of environmental quality influence attitudes and intentions, implying how TRA shaped decisions about pollution mitigation.

The four-stage loyalty theory explains how positive destination experiences can foster commitment and loyalty, which often translate into repeat visits and eco-friendly behaviours. “Itinerary” (17 mentions), “Travel” (31 mentions), and “Visit” (21 mentions) suggest that tourists who are satisfied with their experiences develop a connection with these destinations, making them more inclined to support sustainable practices. Seasonally specific words, such as “Winter” (12 mentions) and “April” (18 mentions), also reflect how seasons influence attachment and loyalty.

Participant characteristics

A total of 438 respondents participated, indicating a relatively balanced gender distribution, 52.7% were male and 47.3% were female. The largest proportion of participants, 34.5%, fell within the 31 to 40 age range. More than half of the respondents, 66%, held undergrad degree. The most common annual income range was \$35,000 to \$49,999, encompassing 26.3%. Regarding employment status, a significant majority, 74.0%, were full-time employees. All respondents had visited the polluted destinations within the last 5 years, with the majority visiting within the last 3–6 months. The demographic details of the respondents were presented in Table 1.

Assessment of the measurement model

The measurement model was evaluated using confirmatory factor analysis, employing AMOS 23 and SPSS 23 as analytical tools. The results denoted satisfactory goodness-of-fit for the overall model ($\chi^2 = 1,275.471$, $p < 0.001$, $\chi^2/df = 1.841$, CFI = 0.954, IFI = 0.955, TLI = 0.949, RMSEA = 0.044). According to the guidelines by Fornell and Larcker (1981) and Hair *et al.* (1986), factor loadings, Cronbach’s alpha, composite reliability (Jabagi *et al.*, 2019), and average variance extracted (AVE) should be ≥ 0.70 , ≥ 0.70 , ≥ 0.70 , and ≥ 0.50 , respectively. Table 2 showed that all factor loadings exceed 0.60, while Cronbach’s alpha, CR values, and AVE values exceed 0.70, indicating sufficient reliability, internal consistency, and convergent validity of the measures. The skewness and kurtosis values remained within the acceptable range of +2 to –2 (Tabachnick *et al.*, 2013), indicating normal distribution of the data in this study. Additionally, to address potential common method bias (CMB), both independent and dependent variables were obtained from the same survey, Harman’s single-factor test was conducted. The results indicated that a single factor explained 32.23% of the variance, which is below the 50% threshold (Hair *et al.*, 2017), confirming that CMB is not a concern in this study.

Structural equation modelling

Structural equation modelling (SEM) was conducted, and results indicated that the goodness-of-fit statistics were acceptable ($\chi^2 = 2080.718$, $p < 0.001$, $\chi^2/df = 2.850$, CFI = 0.894, IFI = 0.895, TLI = 0.887, RMSEA = 0.065). The detailed results of the SEM are exhibited in

Table 1. Demographic information and travel characteristics (n = 438)

Variable	Category	Frequency	Valid percent
Gender	Male	231	52.7
	Female	207	47.3
Age	18–20	13	3.0
	21–30	130	29.7
	31–40	151	34.5
	41–50	51	11.6
	51–60	53	12.1
	61 or above	40	9.1
Educational background	High school or less	5	1.1
	Diploma	41	9.4
	Undergraduate	289	66.0
Average annual income	Postgraduate or above	103	23.5
	Less than \$20,000	45	10.3
	\$20,000–\$34,999	104	23.7
	\$35,000–\$49,999	115	26.3
	\$50,000–\$74,999	66	15.1
	\$75,000–\$99,999	72	16.4
Employment status	Over \$100,000	36	8.2
	Full-time	324	74.0
	Part-time	14	3.2
	Freelance	29	6.6
	Student	42	9.6
	Unemployed/retired	15	3.4
Last visit experience	Others	14	3.2
	Within the last one month	32	7.3
	Within the last 1–3 months	72	16.4
	Within the last 3–6 months	101	23.1
	Within the last 6–9 months	55	12.6
	Within the last 9 months - 1 year	64	14.6
Frequency	Within the last 1–3 year	75	17.1
	Within the last 3–5 year	39	8.9
	Less than 1 time a year	116	26.5
	1–2 times a year	238	54.3
	3–4 times a year	67	15.3
	5 times a year or more	17	3.9

Source(s): Authors' own work

Table 3 and visualized in Figure 4. Specifically, the relationship between problem awareness and ascribed responsibility was significant ($\beta = 0.303$, $t = 5.909$, $p < 0.001$), supporting H1. The relationship between ascribed responsibility and moral norm was also significant ($\beta = 0.277$, $t = 7.271$, $p < 0.001$), supporting H2. Moral norm demonstrated strong predictive power for sustainable transportation usage ($\beta = 0.715$, $t = 11.687$, $p < 0.001$) and walking tours ($\beta = 0.688$, $t = 11.228$, $p < 0.001$), thus supporting H3 and H4, respectively. The influence of moral norm on recycling activities was highly significant ($\beta = 0.787$, $t = 9.748$, $p < 0.001$), supporting H5. Cognitive destination loyalty significantly impacted affective destination loyalty ($\beta = 0.612$, $t = 11.983$, $p < 0.001$), thus supporting H6. Affective destination loyalty positively affected conative destination loyalty ($\beta = 0.627$, $t = 12.285$, $p < 0.001$), supporting H7. The path from conative destination loyalty to moral norm was also significant ($\beta = 0.077$, $t = 2.232$, $p < 0.05$), supporting H8. Furthermore, the path from attitude toward air pollution reduction activities to moral norm was significant ($\beta = 0.411$, $t = 7.977$, $p < 0.001$), supporting hypothesis H9, and social norm also significantly influenced moral norm ($\beta = 0.734$, $t = 13.805$, $p < 0.001$). Therefore, H10 was supported.

Table 2. Results of reliability and validity

Scale items	Loading	Mean	SD
<i>Problem awareness (PA) ($\alpha = 0.931$, AVE = 0.820, CR = 0.932)</i>			
PA1	0.874	4.65	1.520
PA2	0.873	4.66	1.573
PA3	0.892	4.68	1.636
<i>Ascribed responsibility (AR) ($\alpha = 0.894$, AVE = 0.739, CR = 0.895)</i>			
AR1	0.832	5.39	1.225
AR2	0.819	5.40	1.290
AR3	0.826	5.26	1.293
<i>Moral norm (MN) ($\alpha = 0.862$, AVE = 0.676, CR = 0.862)</i>			
MN1	0.767	5.59	1.124
MN2	0.794	5.56	1.173
MN3	0.798	5.56	1.201
<i>Sustainable transportation usage (STU) ($\alpha = 0.862$, AVE = 0.681, CR = 0.864)</i>			
STU1	0.797	5.47	1.165
STU2	0.733	5.45	1.176
STU3	0.822	5.51	1.183
<i>Walking tour (WT) ($\alpha = 0.881$, AVE = 0.714, CR = 0.882)</i>			
WT1	0.780	5.42	1.204
WT2	0.831	5.32	1.295
WT3	0.814	5.36	1.298
<i>Recycling activities (RA) ($\alpha = 0.776$, AVE = 0.537, CR = 0.776)</i>			
RA1	0.816	5.90	0.950
RA2	0.843	5.66	1.106
RA3	0.836	5.62	1.104
<i>Cognitive destination loyalty (COGL) ($\alpha = 0.907$, AVE = 0.710, CR = 0.907)</i>			
COGL1	0.768	5.33	1.094
COGL2	0.785	5.30	1.259
COGL3	0.795	5.18	1.287
COGL4	0.786	5.36	1.255
<i>Affective destination loyalty (AFFL) ($\alpha = 0.899$, AVE = 0.582, CR = 0.869)</i>			
AFFL1	0.776	5.34	1.195
AFFL2	0.749	5.21	1.294
AFFL3	0.779	5.29	1.426
AFFL4	0.780	5.33	1.302
AFFL5	0.708	4.73	1.638
<i>Conative destination loyalty (CONL) ($\alpha = 0.925$, AVE = 0.698, CR = 0.920)</i>			
CONL1	0.743	4.88	1.424
CONL2	0.714	5.04	1.384
CONL3	0.808	5.01	1.488
CONL4	0.805	5.04	1.438
CONL5	0.771	4.89	1.459
<i>Attitude toward air pollution reduction activities (AT) ($\alpha = 0.846$, AVE = 0.586, CR = 0.874)</i>			
AT1	0.862	5.72	1.085
AT2	0.851	5.69	1.140
AT3	0.862	5.61	1.120
AT4	0.704	5.75	1.189
AT5	0.628	5.12	1.66

(continued)

Table 2. Continued

Scale items	Loading	Mean	SD
<i>Social norm (SN) ($\alpha = 0.888$, AVE = 0.727, CR = 0.889)</i>			
SN1	0.824	5.41	1.144
SN2	0.815	5.39	1.255
SN3	0.815	5.40	1.256

Model fit statistics

$\chi^2 = 1,275.471$, $p < 0.001$, $\chi^2/df = 1.841$, CFI = 0.954, IFI = 0.955, TLI = 0.949, RMSEA = 0.044

Note(s): Loading is factor loading coefficient. SD is standard deviation. α is Cronbach's alpha representing internal consistency. AVE: average variance extracted; CR: composite reliability; CFI: comparative fit index; IFI: incremental fit index and RMSEA: root-mean-square error of approximation

Source(s): Authors' own work

Table 3. Results of hypotheses testing and latent paths

Hypothesis				Standardized coefficients	t-value	Results
H1	PA	→	AR	0.303	5.909***	Supported
H2	AR	→	MN	0.277	7.271***	Supported
H3	MN	→	STU	0.715	11.687***	Supported
H4	MN	→	WT	0.688	11.228***	Supported
H5	MN	→	RA	0.787	9.748***	Supported
H6	COGL	→	AFFL	0.612	11.983***	Supported
H7	AFFL	→	CONL	0.627	12.285***	Supported
H8	CONL	→	MN	0.077	2.232*	Supported
H9	AT	→	MN	0.411	7.977***	Supported
H10	SN	→	MN	0.734	13.805***	Supported

Goodness-of-fit statistics

$\chi^2 = 2080.718$, $p < 0.001$, $\chi^2/df = 2.850$, CFI = 0.894, IFI = 0.895, TLI = 0.887, RMSEA = 0.065

Latent paths	β	Lower	Upper
AR→MN→STU	0.198***	0.107	0.295
AR→MN→WT	0.190***	0.103	0.287
AR→MN→RA	0.218***	0.119	0.324
CONL→MN→STU	0.055*	0.007	0.115
CONL→MN→WT	0.053*	0.006	0.109
CONL→MN→RA	0.061*	0.007	0.125
AT→MN→STU	0.294***	0.218	0.385
AT→MN→WT	0.283***	0.209	0.369
AT→MN→RA	0.324***	0.241	0.429
SN→MN→STU	0.525***	0.420	0.633
SN→MN→WT	0.505***	0.393	0.629
SN→MN→RA	0.578***	0.452	0.699

Note(s): PA: Problem awareness, AR: Ascribed responsibility, MN: Moral norm, STU: Sustainable transportation usage, WT: Walking tour, RA: Recycling activities, COGL: Cognitive destination loyalty, AFFL: Affective destination loyalty, CONL: Conative destination loyalty, AT: Attitude toward air pollution reduction activities and SN: Social norm

RMSEA: root-mean-square error of approximation; CFI: confirmatory fit index; IFI: incremental fit index.

*** $p < 0.001$, ** $p < 0.01$, and * $p < 0.05$

Source(s): Authors' own work

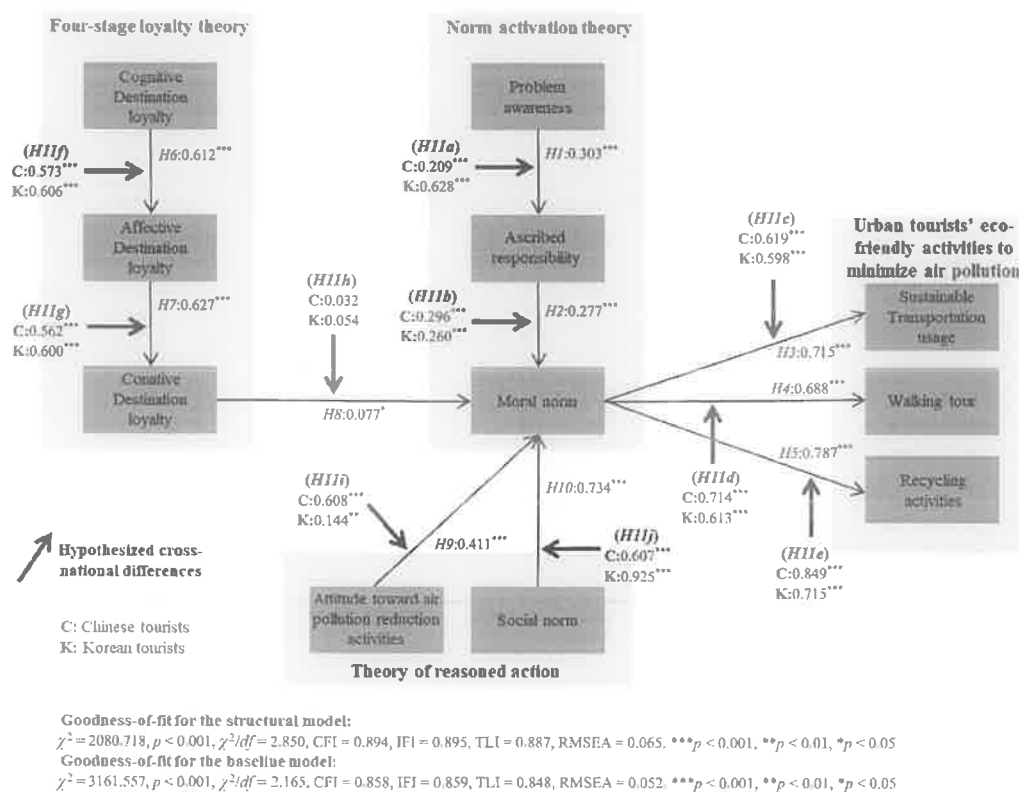


Figure 4. Structural analysis results. Source: Authors' own work

Subsequently, the indirect effects among the study variables were assessed. As shown in the results of the indirect effect analysis in Table 3, ascribed responsibility, conative destination loyalty, attitude toward air pollution reduction activities, and social norm influenced sustainable transportation usage, walking tour, and recycling activities through moral norm. These results indicate that moral norm played a significant mediating role within the proposed theoretical framework.

Multi-group analysis

A multi-group analysis was conducted to examine whether the relationships differed between Chinese tourists ($n = 212$) and Korean tourists ($n = 226$) based on perceived destination air quality. Table 4 and Figure 4 show that the baseline model fit statistics ($\chi^2 = 3,161.557$, $df = 1,460$, $p < 0.001$, $\chi^2/df = 2.165$, CFI = 0.858, IFI = 0.859, TLI = 0.848, RMSEA = 0.052) specified a good fit. Chi-square difference tests between the baseline and nested models revealed significant group differences between Chinese and Korean tourists, indicating that several structural paths differed across the two national groups. Specifically, the relationships included problem awareness to ascribed responsibility ($\Delta\chi^2(1) = 39.838$, $p < 0.05$), ascribed responsibility to moral norm ($\Delta\chi^2(1) = 6.222$, $p < 0.05$), moral norm to sustainable transportation usage ($\Delta\chi^2(1) = 5.527$, $p < 0.05$), moral norm to walking tours ($\Delta\chi^2(1) = 11.223$, $p < 0.05$), and social norm to moral norm ($\Delta\chi^2(1) = 46.468$, $p < 0.05$), indicating significant differences between the two tourist groups. Therefore, H11a, H11b, H11c, H11d, and H11j were supported. Conversely, the following relationships were not supported: moral norm to recycling activities ($\Delta\chi^2(1) = 2.224$, $p > 0.05$), cognitive destination loyalty to affective destination loyalty ($\Delta\chi^2(1) = 2.131$, $p > 0.05$), affective destination loyalty to conative destination loyalty ($\Delta\chi^2(1) = 0$, $p > 0.05$), conative destination loyalty to moral norm

Table 4. Structural-invariance models (Chinese vs. Korean tourists)

Path	Chinese tourists (n = 212)		Korean tourists (n = 226)		Nested model
	β	t-value	β	t-value	
H11a	PA	AR	0.209	2.763**	$\chi^2(1,461) = 3201.395$
H11b	AR	MN	0.296	3.259**	$\chi^2(1,461) = 3167.779$
H11c	MN	STU	0.619	3.887***	$\chi^2(1,461) = 3167.084$
H11d	MN	WT	0.714	4.227***	$\chi^2(1,461) = 3172.78$
H11e	MN	RA	0.849	3.331***	$\chi^2(1,461) = 3163.781$
H11f	COGL	AFFL	0.573	8.205***	$\chi^2(1,461) = 3163.688$
H11g	AFFL	CONL	0.562	7.905***	$\chi^2(1,461) = 3161.557$
H11h	CONL	MN	0.032	0.469	$\chi^2(1,461) = 3162.609$
H11i	AT	MN	0.608	4.243***	$\chi^2(1,461) = 3,161.647$
H11j	SN	MN	0.607	4.427***	$\chi^2(1,461) = 3208.025$

Baseline model Goodness-of-fit

$\chi^2 = 3,161.557$, $p < 0.001$, $\chi^2/df = 2.165$, CFI = 0.858, IFI = 0.859, TLI = 0.848, RMSEA = 0.052

Chi-square difference test

$\Delta\chi^2(1) = 39.838$, $p < 0.05$ H11a: Supported (Groups are different at the model)

$\Delta\chi^2(1) = 6.222$, $p < 0.05$ H11b: Supported (Groups are different at the model)

$\Delta\chi^2(1) = 5.527$, $p < 0.05$ H11c: Supported (Groups are different at the model)

$\Delta\chi^2(1) = 11.223$, $p < 0.05$ H11d: Supported (Groups are different at the model)

$\Delta\chi^2(1) = 2.224$, $p > 0.05$ H11e: Not supported

$\Delta\chi^2(1) = 2.131$, $p > 0.05$ H11f: Not supported

$\Delta\chi^2(1) = 0$, $p > 0.05$ H11g: Not supported

$\Delta\chi^2(1) = 1.052$, $p > 0.05$ H11h: Not supported

$\Delta\chi^2(1) = 0.090$, $p > 0.05$ H11i: Not supported

$\Delta\chi^2(1) = 46.468$, $p < 0.05$ H11j: Supported (Groups are different at the model)

Note(s): PA: Problem awareness, AR: Ascribed responsibility, MN: Moral norm, STU: Sustainable transportation usage, WT: Walking tour, RA: Recycling activities, COGL: Cognitive destination loyalty, AFFL: Affective destination loyalty, CONL: Conative destination loyalty, AT: Attitude toward air pollution reduction activities and SN: Social norm
RMSEA: root-mean-square error of approximation; CFI: confirmatory fit index; IFI: incremental fit index. *** $p < 0.001$, ** $p < 0.01$, and * $p < 0.05$

Source(s): Authors' own work

($\Delta\chi^2(1) = 1.052, p > 0.05$), and attitude toward air pollution reduction activities to moral norm ($\Delta\chi^2(1) = 0.090, p > 0.05$), suggesting no significant differences in these relationships across the groups. Therefore, H11e, H11f, H11g, H11h, and H11i were not supported.

Discussion and conclusions

This study provides a nuanced understanding of the factors driving tourists' engagement in eco-friendly activities aimed at minimizing air pollution in urban destinations. By integrating NAT, four-stage loyalty theory, and TRA, this research elucidates the key roles of environmental awareness, destination attachment, and social norms in motivating eco-friendly actions in polluted urban tourism destinations. Employing a combination of UGC analysis on TripAdvisor reviews and SEM of survey data, the study reveals the cross-national differences in Chinese and Korean tourists' eco-friendly activities to minimize air pollution and identifies pathways for promoting sustainable tourism practices effectively.

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Conclusions

UGC analysis results highlight that tourist awareness of environmental issues, as defined in NAT, plays a central role in promoting pro-environmental behaviours in response to air pollution concerns. SEM findings support the idea that problem awareness significantly influences ascribed responsibility (H1), which translates into moral norms, leading to actions such as sustainable transportation usage (H3), walking tours (H4), and recycling activities (H5). These findings align with existing studies, where NAT emphasized the importance of awareness in promoting personal responsibility and motivating eco-friendly actions (Schwartz, 1977). This study confirms that awareness-raising initiatives can effectively foster tourists' engagement in pollution-reducing behaviours.

The analysis of loyalty dynamics within the framework of the four-stage loyalty theory showed how cognitive loyalty to a destination can develop into affective loyalty (H6) and conative loyalty (H7), ultimately leading to behaviours that support sustainability. The relationship between conative loyalty and moral norms (H8) indicated that loyal tourists were inclined to adopt behaviours that help preserve the destination, reinforcing the idea that loyalty extends beyond visitation to sustainable practices. This insight builds on previous research that suggests that positive experiences deepen tourists' attachment to a destination, driving them to act in ways that protect and sustain it (Yoon and Uysal, 2005).

Furthermore, TRA's emphasis on the role of attitudes and social norms is reflected in this study's findings, where attitudes toward air pollution reduction (H9) and social norms (H10) positively influenced moral norms. These results underscore the significance of social and individual influences in shaping intentions to engage in sustainable behaviours, as supported by TRA's assertion that behaviour is often guided by social expectations (Ajzen, 1991). Public campaigns emphasizing collective responsibility can thus reinforce eco-friendly practices among tourists, highlighting the benefits of pollution reduction efforts.

This study also explored cross-national differences in eco-friendly behaviours aimed at reducing air pollution, highlighting distinct response between Chinese and Korean tourists. Chinese tourists demonstrated a higher inclination toward sustainable transportation usage and walking tour compared to Korean tourists. However, no significant differences were observed between the two groups in engagement with recycling activities. As for the influencing factors, Korean tourists exhibited a stronger reaction to problem awareness and social norms, signifying that air pollution awareness campaigns and community-focused sustainability activities may be particularly effective in influencing their sustainable behaviour. In contrast, Chinese tourists were more responsive to ascribed responsibility, indicating that strategies emphasizing their individual role in air pollution reduction are likely enhance their engagement in eco-friendly activities. This distinction highlights the need for culturally sensitive approaches in promoting sustainable tourism practices of tourists.

Theoretical implications

This study makes multiple contributions to tourism literature by integrating NAT, four-stage loyalty theory, and TRA to understand sustainable behaviour in the urban destinations affected by air pollution. First, it bridges environmental psychology and tourism behaviour by presenting a comprehensive psycho-social model that highlights how awareness of environmental problems, social influences, and personal responsibility collectively shaped tourists' eco-friendly behaviours. This extension deepens prior findings (e.g. Bamberg and Möser, 2007; Hwang *et al.*, 2024; Sharmin *et al.*, 2020), by contextualizing them in pollution-challenged urban tourism environments.

Second, the study theoretically extends the four-stage loyalty theory by demonstrating that conative destination loyalty—a tourist's intention to revisit—not only reflects behavioural commitment but also positively influences the development of moral norm. This novel linkage between loyalty and moral obligation contributes to a more nuanced understanding of loyalty as a motivational force behind sustainable tourism behaviours, while also highlighting the influence of the tourist-destination relationship on such behaviours, thereby expanding upon existing studies (Chubchuwong *et al.*, 2015; Nasir *et al.*, 2020; Yoon and Uysal, 2005).

Third, NAT is enriched by highlighting the role of moral norm in transforming behavioural commitment—such as the desire to revisit—into a strong intention to engage in eco-friendly behaviours at a destination. This study offers new insights into how tourists' ascribed responsibility evolves through both cognitive and emotional pathways (De Groot and Steg, 2009; Tavitiyaman *et al.*, 2024). Lastly, by incorporating cross-national comparison, this study refines the understanding of cultural influence on sustainable tourism behaviour. While previous research confirmed that national differences influence sustainable behaviour (e.g. Chen *et al.*, 2023; Kang and Moscardo, 2006; Zhang, 2024), this study uniquely demonstrates that these differences selectively affect certain pro-environmental behaviours—such as sustainable transportation and walking tour—but not recycling activities. This contributes to a more granular, culturally sensitive understanding of behavioural intention formation in urban tourism context of polluted destinations.

Practical implications

The findings provide important insights for destination managers and policymakers seeking to minimize tourism-related air pollution through sustainable practices. Given the influence of environmental awareness on tourists' behaviours, destination managers should prioritize targeted awareness-driven campaigns at key tourist touchpoints such as airport and city centre. These could include displaying real-time pollution data or providing before-after visuals of air pollution on digital screens to reinforce cognitive and emotional engagement, encouraging the use of tourism mobile applications which suggest eco-friendly transportation options, walking routes, and practical tips on reducing exposure to pollution. Effective messaging can amplify tourists' environmental consciousness and encouraging sustainable practices.

To harness the power of loyalty, as suggested by the text analysis, destination marketers should enhance the visitor experience by promoting specific seasons with better air quality, which could increase tourist satisfaction and attachment to the destination. By highlighting spring and autumn, when air quality tends to improve, destinations can provide more enjoyable and sustainable experiences. TRA suggests that framing pollution reduction as a social norm can be highly effective. Campaigns encouraging tourists to participate in local initiatives or community events aimed at reducing pollution and promoting sustainability can foster a sense of shared purpose. This approach aligns individual actions with broader environmental goals while deepening tourists' connection to the destination.

Finally, these findings emphasize the significance of culturally tailored approaches in sustainable tourism campaigns. Given the differences between Chinese and Korean tourists on their engagement in sustainable activities, communication messages should be adapted to reflect each group's specific preferences. For Korean tourists, emphasizing community-driven

initiatives and group participation that highlight collective responsibility—for example, showcasing how majority of travellers choose clean-air tours. Destination manager can promote low-carbon locally led walking tours (Fakfare and Wattanacharoensil, 2023), by leveraging social norm to enhance participation and position these activities as desirable and sustainable tourism choices. For Chinese tourists, communication message should focus on their sense of individual responsibility, such as illustrating how personal action, using bike-sharing and joining walking tours, can contribute to air pollution reduction.

Limitations and future research

This study offers important insights into promoting sustainable tourism behaviours. However, it is essential to acknowledge certain limitations that should be addressed in future research. First, this study focuses primarily on Asian urban destinations, limiting its generalizability to non-Asian or rural contexts where environmental attitudes and behaviours may differ. Comparative studies across diverse cultural and geographic settings would provide a more comprehensive understanding of eco-friendly tourism motivations. Second, the qualitative study relies heavily on TripAdvisor reviews, which may not fully capture the diversity of tourist perspectives across other platforms or in less tech-savvy demographics. Future research could broaden data sources by incorporating additional social media platforms and review sites, expanding the sample's representativeness. Third, while the integration of NAT, four-stage loyalty theory, and TRA offers a robust framework, exploring other theoretical perspectives, such as the theory of planned behaviour, could enrich the understanding of the complex influences on tourists' sustainable behaviours. Longitudinal studies would also be beneficial, examining how repeated visits and changing environmental conditions impact tourists' commitment to eco-friendly practices over time. Fourth, since this study focuses on exploring the mediating role of moral norms, it does not include the direct paths from the independent variables (such as ascribed responsibility, attitude toward air pollution reduction activities, and social norm) to eco-friendly tourist behaviours. Finally, incorporating experimental studies that merge with digital technologies such as virtual reality and Metaverse (Huang and Leung, 2024) could provide deeper insights into tourists' motivations and effective strategies to enhance sustainable tourism behaviours.

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(The Appendix follows overleaf)

Table A1. Measurement scale items

3582

Constructs and measurement items	References
<i>Problem awareness</i>	Han (2015)
PA1: I am concerned that the tourism industry causes air pollution and climate change	
PA2: I am concerned that the tourism industry exerts environmental impact on tourism destinations (e.g. haze pollution, greenhouse gas emissions)	
PA3: I am concerned that the tourism industry causes air quality issues (e.g. fine dust, smog)	
<i>Ascribed responsibility</i>	Han (2015)
AR1: I believe that every traveller is partly responsible for air pollution	
AR2: I feel that all travellers are jointly responsible for air pollution	
AR3: Every traveller should take partly responsibility for the air pollution problem caused by tourism	
<i>Moral norm</i>	Stern (2000)
MN1: I feel morally obliged to practice air pollution reduction behaviours when travelling	
MN2: I feel personally obliged to travel in an environmentally sound way that eventually minimizes air pollution	
MN3: I feel a moral obligation to travel in an eco-friendly way for air pollution reduction	
<i>Sustainable transportation usage</i>	Han (2015)
STU1: I would use sustainable transportation (e.g. bicycle, electric/alternative-fuel vehicles, public transportation, car-sharing) when travelling to a destination with an air pollution issue	
STU2: I would use affordable modes of transport (e.g. bicycle, electric/alternative-fuel vehicles, public transportation, car-sharing) when travelling to a destination with an air pollution issue	
STU3: I expend effort on using a sustainable transportation (e.g. bicycle, electric/alternative-fuel vehicles, public transportations, car-sharing) when travelling to a destination with an air pollution issue	
<i>Walking tour</i>	Lee <i>et al.</i> , (2013), Leung (2023) and Han (2015)
WT1: I would cut down on car journeys and increase walking tours when travelling to a destination with an air pollution issue	
WT2: I would walk more frequently when travelling to a destination with an air pollution issue	
WT3: I expend effort on walking in local places when travelling to a destination with an air pollution issue	
<i>Recycling activities</i>	Lee <i>et al.</i> (2013)
RA1: I would try to dispose of garbage properly, if possible, into separate containers for paper, plastic, glass, and so on	
RA2: I would buy products in eco-friendly packaging whenever possible. That is, I would avoid plastic shopping bags, plastic bottles, and try to reuse bottles and bags	
RA3: I would try to learn about the recycling facilities and actions of the locals	

(continued)

Table A1. Continued

Constructs and measurement items	References
<i>Cognitive destination loyalty</i>	Baloglu and McCleary (1999)
COGL1: Despite its air pollution issues, travelling to this destination offers valuable experiences	
COGL2: Overall, despite its air pollution issues, travelling to this destination is valuable	
COGL3: Despite its air pollution issues, this destination offers quality tourism experiences	
COGL4: Overall, despite its air pollution issues, the quality of tourism experiences at this destination is good	
<i>Affective destination loyalty*</i>	Stylos et al. (2016)
Despite its air pollution issues, travelling to the destination is . . .	
AFFL1: unpleasant[1]/ pleasant[7]	
AFFL2: gloomy[1]/ exciting[7]	
AFFL3: distressing [1]/ relaxing[7]	
AFFL4: unenjoyable[1]/ enjoyable [7]	
AFFL5: favourable[1]/ unfavourable [7]**	
<i>Conative destination loyalty</i>	Stylos et al. (2016)
CONL1: Despite its air pollution issues, the place as a tourism destination is always a dream-destination to visit	
CONL2: Despite its air pollution issues, the place as a tourism destination is always a personal goal for vacation	
CONL3: Despite its air pollution issues, the place as a tourism destination has evoked a persistent wish to visit it	
CONL4: Despite its air pollution issues, the place as a tourism destination expresses me as a suitable vacation choice	
CONL5: Despite its air pollution issues, the place as a tourism destination makes me believe that my vacations there may be the best reward, I can offer myself	
<i>Attitude toward air pollution reduction activities*</i>	Ajzen (1991)
For me, travelling in an eco-friendly way for air pollution reduction is . . .	
AT1: bad[1]/ good[7]	
AT2: foolish[1]/ wise[7]	
AT3: unpleasant[1]/ pleasant[7]	
AT4: harmful[1]/ beneficial[7]	
AT5: favourable[1]/ unfavourable[7]**	
<i>Social norm</i>	Ajzen (1991)
SN1: Most people who are important to me think I should practice air pollution reduction behaviours when travelling	
SN2: Most people who are important to me want me to practice air pollution reduction behaviours when travelling	
SN3: Most people whose opinions I value would prefer me to practice air pollution reduction behaviours when travelling	
Note(s): *Semantic differential scale. **This item is reversely coded	
Source(s): Authors' own work	

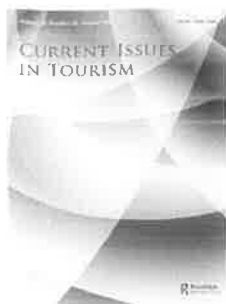
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RESEARCH ARTICLE



Exploring traveller willingness to shift towards air pollution-free destinations: developing the multiple configurations of push, pull, and mooring factors

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ABSTRACT

This study examines factors influencing travellers' intention to switch to air pollution-free destinations using the push – pull-mooring theory. The results of structural equation modelling reveal that push factors have the most substantial effect on travellers' switching intention. The findings highlight the strong preventive role of air pollution in travel behaviour, where the avoidance of polluted destinations compensated for the appeal of destinations. User-generated content (UGC) analysis revealed seasonal variations in air pollution, increasing traveller concerns and impacting travel intention. The study employed a fuzzy-set qualitative comparative analysis to uncover the multiple configurations of push, pull, and mooring factors that contribute to travellers' switching intention rather than any single factor. These insights offer significant implications for advancing tourism literature and informing practical strategies for tourism practitioners in leading Asian destinations.

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Air quality impact;
destination switching;
preventive travel decisions;
tourist perception; traveller
behaviour; travel decision-
making

Introduction

Air pollution has emerged as a critical global issue due to its profoundly adverse effects on human health, the environment, and tourism destinations. Urban areas have been traditionally perceived as more vulnerable to air pollution, while natural destinations are considered relatively safer (K. Zhang et al., 2020). Nonetheless, recent studies suggest that air pollution is also a risk to nature-based destinations, adversely affecting ecosystems and visitor experiences (Cao et al., 2024; Eusébio et al., 2022). Additionally, air pollution has been associated with a reduction in life expectancy, and fine particulate matter (PM_{2.5}) is responsible for approximately 7 million premature deaths annually, with Asia being the most affected region (AQLI, 2023; WHO, 2022).

Major tourism destinations have recorded notable seasonal variations in air quality, with levels exceeding the PM_{2.5} threshold in Seoul, Singapore, Kuala Lumpur, Tokyo, Osaka, Phuket, Bangkok, Chiang Mai, Bali, Hong Kong, Ho Chi Minh City, Hanoi, Abu Dhabi, Dubai, Beijing, Shanghai, Shenzhen, Taipei, and Guangzhou (Euromonitor, 2023; IQAir, 2023; Mastercard, 2019). Travellers' concerns associated with air pollution potentially influence their intentions to switch to air pollution-free destinations. This turning intention could have adverse implications for the tourism industry in the region and beyond. Travellers who encounter air pollution in their local environments also tend to avoid it through various means when travelling (Xue & Gao, 2022). The heightened sensitivity to air pollution among Koreans can be attributed to the country's ongoing challenge with fine

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dust pollution since the mid-2010s (M. Zhang, 2024). In Korea, air quality is considered heavily polluted when PM_{2.5} levels exceed 75 µg/m³, while in countries such as China, the threshold is 150 µg/m³, and in the U.S., levels above 200 µg/m³ are classified as very unhealthy (Center for Statistical Science, 2015; IQAir, 2024). Given this difference, Koreans are more likely to be concerned about air pollution, making it particularly meaningful to explore their perceptions and travel intentions.

In previous studies examining tourists' perception and experiences related to air pollution, haze has been a commonly used indicator for assessing perceptions of air quality (D. Xu et al., 2020; Yang et al., 2022; K. Zhang et al., 2020). Although the effects of air pollution vary across all individuals, destinations, and seasons, travellers exposed to short-term air pollution at a destination are likely to notice its visible impact on their travel experience. In particular, haze plays a significant role as it impairs visibility, reduces the appeal of the destinations, and restricts traveller enjoyment, thereby directly influencing their overall travel experiences (Poudyal et al., 2013; Yang et al., 2022).

The existing research has revealed the significant impact of air pollution on traveller intention and behaviour, such as avoiding polluted destinations (Becken et al., 2017; Tang et al., 2019), postponing or shortening trips (Ruan et al., 2020), adapting behaviour to prevent health effects during travel (Rodrigues et al., 2023), and shaping travel intentions (Peng & Xiao, 2018). Despite growing concerns about air pollution driving changes in traveller intentions, most research has focused on specific destinations and employed single data source, with limited consideration of both antecedents from tourists and the destinations (McKercher et al., 2015; Nripendra et al., 2023; Yang et al., 2022; K. Zhang et al., 2020). Greater attention should be given to broader spatial and temporal perspectives to gain a more comprehensive understanding of the impact of air pollution on travellers' switching intentions (Cao et al., 2024; Yu et al., 2024).

This study addresses existing gaps by applying the push – pull-mooring theory to explore the comprehensive antecedents of travellers' intentions to switch to air pollution-free destinations. Additionally, actual traveller experiences related to air pollution were extracted through a user-generated content analysis from online tourism platforms, supporting a temporal perspective and validating the quantitative study. Major tourist destinations in Asia affected by air pollution were included in the analysis. This study not only broadens the theoretical application and deepens the understanding of the impact of air pollution but also provides practical insights for destination management authorities. The findings can provide strategies to improve tourist experiences in Asian destinations facing air pollution challenges.

Literature review

Switching intention

Switching intention is proposed as the result of push factors driving individuals away from the origin and pull factors attracting them towards the destination (Moon, 1995). This concept is rooted in the migration and consumer behaviour literature, where switching behaviour is often driven by dissatisfaction with the current choice or the discovery of a more attractive alternative (Bansal et al., 2005; Nguyen et al., 2022). In the context of air pollution, its impact at the place of origin has been shown to significantly influence residents' willingness to migrate and their actual migration behaviour (X. Xu & Sylwester, 2016). Arguably, travellers with firsthand experience of haze tend to avoid destinations affected by air pollution by seeking alternative options (Xue & Gao, 2022). This switching intention reflects their proactive efforts to avoid environments perceived as a harmful to their well-being (Jung et al., 2017). Travellers who prioritise clean air destinations for a safer, more enjoyable experience are likely influenced by environmental awareness, health concerns, and societal pressures for sustainable practices (A. Chen & Peng, 2012; Han, 2015). This intention aligns with the growing trend of eco-conscious travel, where decisions are shaped by ecological considerations and the perceived environmental quality (Gössling et al., 2021). In this study, switching intention is viewed as a

multidimensional construct involving the choice of clean air destinations and adapting travel plans to prioritise sustainable practices.

Push–Pull–Mooring model

The push – pull–mooring (PPM) model, rooted in migration theory (Lewis, 1982), explains the factors influencing individuals to relocate from one place to another. Moon (1995) later enhanced the model by incorporating mooring factors, which addressed the limitations of Lewis’s model in capturing migration dynamics at the microscopic level. The PPM model has been expanded to explain customer switching behaviour as it can be considered as another type of migration (Bansal et al., 2005; Njite et al., 2008). The PPM model has been widely adopted across tourism disciplines, such as in green transportation, the airline industry (Jung et al., 2017; Wang et al., 2020), and green hotels (Quan et al., 2023), including avoidance intention of space tourism (Olya & Han, 2023). Some scholars classify the push factor as the internal factor and pull factor as an external factor, while others associate the push – pull factors with negative and positive influences, respectively (Quan et al., 2023). The mooring factors, on the other hand, either facilitate or hinder the decision to shift (Olya & Han, 2023). The variation in interpretation allows flexibility in the PPM model.

Push factors

Push factors represent negative stimuli that drive individuals away from a particular situation or environment (Moon, 1995). They can be compatible with factors that drive travellers away from destinations suffering from air pollution. Environmental policy, social media effect, and social norms serve as push factors that encourage travellers to shift their decision towards choosing cleaner-air destinations. Environmental policy also acts as a critical push factor since it is a key approach to managing the relationship between people and the natural environment, with the goal of addressing current environmental challenges (Eccleston & March, 2011). Air quality, especially in popular tourism destinations in Southeast Asia, such as Indonesia, Vietnam, and Thailand, has been found to exceed the WHO guidelines, which is harmful to life and well-being of people (AQLI, 2023). Destinations have adopted various policies and measures to address air pollution challenges, such as South Korea and China’s winter season special reduction policies (Cha et al., 2023) and Thailand’s initiatives to ban open burning and cooperate with vehicle manufacturers (Statista, 2023). Travellers are often pushed away from visiting destinations that lack effective environmental policies. This is because they tend to steer clear of destinations with inadequate pollution control or weak environmental protections (H. Zhang et al., 2018), seeking to avoid exposure to unhealthy conditions, such as poor air quality (Kim et al., 2024).

Social media has emerged as an important source of information about air pollution in tourism destinations (Z. Chen et al., 2020), particularly for international travellers who are less familiar with the local environmental conditions compared to residents (Yang et al., 2022). Moreover, negative media coverage on pollution may possibly deter travellers and support their decisions to avoid polluted destinations (A. Zhang et al., 2015), with its targeted content on air quality shaping travel decisions (Quan et al., 2023) and expectation about their travel experiences (Yang et al., 2022). Consequently, social media affects travellers’ decision, arguably prompting them to choose cleaner-air destinations over those with higher air pollution levels.

Individuals may feel compelled to avoid polluted destinations in response to social norms, which are the societal expectations regarding eco-conscious behaviour (Ajzen, 1991). Individuals often seek acceptance and respect from others, making social norms a key factor influencing their behaviour and intention (Li et al., 2019). Social norms have been shown to affect travellers’ decisions to shift their travel plans to support pollution reduction, such as adopting recycling and waste reduction practices (Han et al., 2018) or opting for green hotels and sustainable transportation options (D’Arco et al., 2023). Based on this discussion, the following hypothesis was formulated:

Hypothesis 1: Push factors positively affect switching intention.

Pull factors

Pull factors refer to the positive stimuli that attract people to a destination due to convincing situations (Bansal et al., 2005). This study includes factors that attract travellers to shift their decision to visit cleaner-air destinations. Previous studies have identified perceived health and well-being benefits, destination image, and personal norms as pull factors influencing shifting behaviour in tourism services (Jung et al., 2017; Olya & Han, 2023; Quan et al., 2023).

Perceived health and well-being benefits play a crucial role in attracting travellers to cleaner destinations (Quan et al., 2023; Ruan et al., 2020). Travellers increasingly prioritise destinations that offer health and well-being benefits, especially in urban areas where air quality is a persistent concern (Yang et al., 2022). Studies indicate that travellers exposed to elevated levels of PM_{2.5} often report dissatisfaction, diminished travel motivation, and potential health risks (Cao et al., 2024; WHO, 2022; Xue & Gao, 2022). These unsatisfied and demotivated travellers arguably avoid travelling to the polluted destinations, especially those who are concerned about their health and well-being (Jung et al., 2017; Rodrigues et al., 2023). This preventive behaviour reflects the travellers' decision-making regarding the mitigation of air pollution effects.

The destination image reflects travellers' perceptions, beliefs, and overall impressions, which are formed through cognitive and affective evaluations (Baloglu & McCleary, 1999). When the destination is associated with poor air quality, this image deteriorates and pushes travellers to seek cleaner-air alternatives. On the other hand, clean environments are the pull factors that enhance destination attractiveness through a favourable image of wellness and scenic beauty (Becken et al., 2017; Liang & Xue, 2021). However, destinations with an unfavourable image, including pollution, can still draw travellers if other positive factors, such as unique attractions, outweigh concerns (Baloglu & McCleary, 1999; Lehto, 2013).

Personal norms, grounded in the norm-activation model (Schwartz, 1977), provide a robust framework for understanding the role of moral obligations. It proposes that these personal norms play a crucial role in motivating individuals to engage in pro-environmental activities. Travellers with high moral responsibility are more inclined to choose destinations and activities that minimise environmental harm, such as staying at green accommodations and volunteering to protect environment (Han, 2015; Wu et al., 2021). Additionally, Shi et al. (2017) conducted a study in Chinese urban areas and found that personal norms serve as an additional factor, increasing the variance in predicting air-pollution reduction behaviour. This moral imperative is likely extended to destination selection, where clean-air destinations are perceived as more ethically aligned with travellers' personal norms.

This study applied this psychological factor as a pull factor to reflect the impact of internal moral obligations on travellers' intention to switch to cleaner-air destinations. Based on this discussion, the following hypothesis was proposed:

Hypothesis 2: Pull factors positively affect switching intention.

Mooring factors

Mooring factors can facilitate or interrupt a traveller's decision to shift from one destination to another (Hou et al., 2011). These factors include both individual characteristics and social aspects that influence decision-making processes about a personal or environment (Jung et al., 2017). Personal, cultural, and social attributes, such as variety seeking, attitude towards air pollution, and environmental values, were incorporated in the previous studies related to the intention to stay or to relocate to a new destination (Moon, 1995; Olya & Han, 2023).

Variety seeking can be explained as the preference to pursue unfamiliar experience among many diverse options (Kahn, 1995). This personal characteristic was applied as a mooring factor and was found to significantly affect travellers' intention to switch intention to another airlines, shift their decision to avoid novel space travel, travel to a reopening theme park after the pandemic (Jung et al., 2017; Olya & Han, 2023; Xie & Luo, 2021). Some travellers may switch their travel decision not only due to the dissatisfaction with their current choice, but also due to a desire to explore

new services (Jung et al., 2017; Roos & Gustafsson, 2007). Travellers arguably avoid destinations with air pollution not only because of its negative effects on health, well-being, and experiences, but also because they seek a new tourism experience in destinations with better air quality.

Attitude refers to an individual's overall assessment of engaging in a particular behaviour – object, people, or situation (Ajzen, 1991). This study adopted attitudes towards air pollution to examine their impact on shaping travel intentions. Empirical studies have confirmed that tourists' attitudes towards air-pollution significantly influence their destination choices. Negative attitudes towards destinations with air pollution strongly predict travellers' intention to avoid polluted cities, favouring destinations with better air quality (Carneiro et al., 2021; Peng & Xiao, 2018). On the other hand, positive attitudes towards destinations with higher air quality positively influence travellers' willingness to travel (Cao et al., 2024).

Opportunity loss is the concerns about perceived time loss may not fully capture the missed opportunities and regret from a failed purchase, especially considering effort and cost of finding alternatives (Holland et al., 2022). It was adopted in previous studies as one of the factors, time related risk, in multi-dimensional tourism risk refers to the unfavourable consequences that experienced by travellers during their trip in various contexts, such as ocean cruising and mobile travel booking (Cui et al., 2016; Holland et al., 2022; Park & Tussyadiah, 2017). This study regards opportunity loss as the concern over reduced visibility or visual enjoyment caused by air pollution. Anxiety related to this loss was identified as a significant factor influencing international travellers' intentions to travel (Becken et al., 2017; Reisinger & Mavondo, 2005). However, traveller behaviour driven by risk perception was found to be situation-specific (Roehl & Fesenmaier, 1992). Thus, in the context of air-polluted destinations, the perceived risk of opportunity loss may impact travellers' intention to choose alternative destinations.

Environmental values in this study refer to the belief in protecting the environment, which shapes pro-environmental attitudes and behaviours (Han, 2015). The role of values has been a longstanding focus in the study of environmental behaviour. Travellers with strong environmental values are more likely to show concern for pollution and environment or engage in eco-friendly behaviours (de Groot & Steg, 2008; He et al., 2024). Additionally, travellers' pro-environmental concerns, shaped by personal factors, trip characteristics, and their residential area, can impact their choice of destination (Campos-Soria et al., 2021). These findings could extend to the destination choice, where travellers with strong environmental values are more likely to prioritise destinations that align with their values and avoid polluted destinations (Han, 2015). Based on the discussion above, the following hypothesis was proposed:

Hypothesis 3: Mooring factors positively affect switching intention.

This study leverages the PPM model to understand and identify configurations of conditions leading to the travellers' switching intention to air pollution-free destinations. By analysing the push, pull, and mooring factors within this framework, the study aims to reveal the complexity of predictors and factors behind travellers' destination choices regarding air pollution. Hence, based on these aspects, this study proposes the following:

Proposition 1: There is no single optimal configuration of push factors that leads to high switching intention; instead, there are multiple, equifinal configurations of conditions.

Proposition 2: There is no single optimal configuration of pull factors that leads to high switching intention; instead, there are multiple, equifinal configurations of conditions.

Proposition 3: There is no single optimal configuration of mooring factors that leads to high switching intention; instead, there are multiple, equifinal configurations of conditions.

Proposition 4: There is no single optimal configuration of push, pull, and mooring factors that leads to high switching intention; instead, there are multiple, equifinal configurations of conditions.

The theoretical framework incorporating relevant constructs and hypotheses is shown in Figure 1.

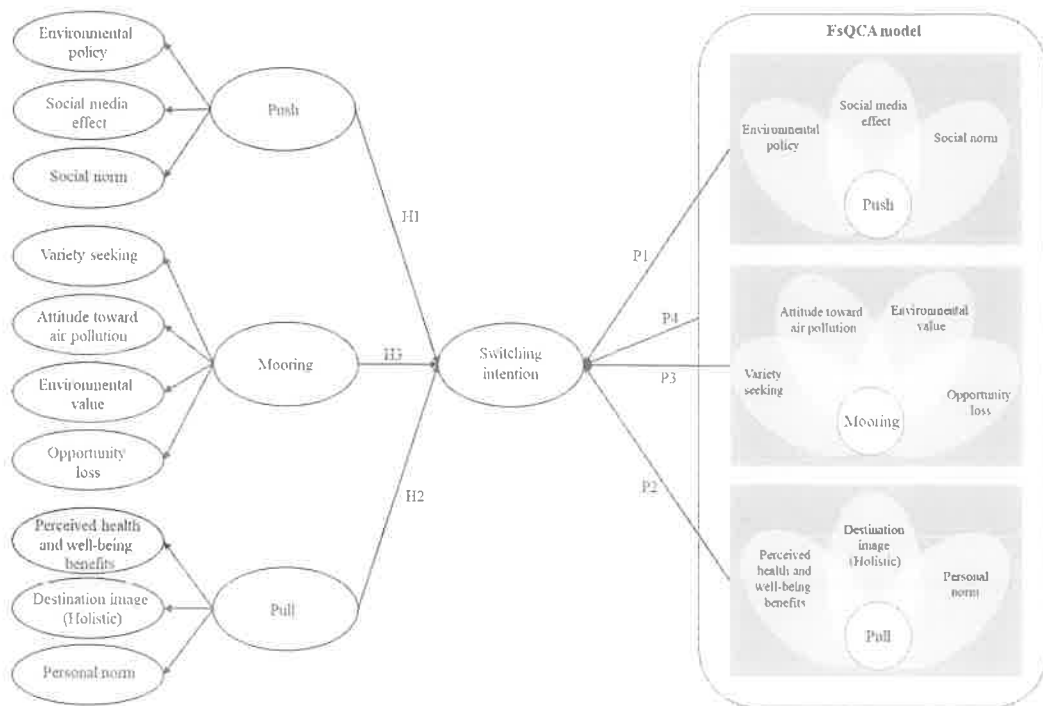


Figure 1. Research model.

Methodology

This study utilised an integrative approach for a comprehensive analysis. User-generated content (UGC) analysis was conducted to collect and interpret textual data from Tripadvisor. Quantitative data was additionally gathered and analysed using structured surveys and statistical tools, including structural equation modelling (SEM) and fuzzy-set qualitative comparative analysis (fsQCA).

User-generated content analysis

Web scraping was employed to collect data from Tripadvisor forums. These forums are a key feature of Tripadvisor, a prominent travel website that facilitates a global exchange of travel experiences, advice, and recommendations (Sangkaew et al., 2023), which makes the site a rich source of qualitative data. Data collection targeted topics from the Asia-Pacific forums discussing 'air pollution', spanning from January 2019 to February 2024. This dataset provides insights from travellers engaged in discussions about air pollution, contributing to the understanding of their perceptions and experiences. The KNIME analytics platform was utilised and it has been previously employed in studies examining online reviews of cultural attractions (Sincharoenkul & Sangkaew, 2023) and restaurant reviews (Sangkaew et al., 2023).

The text analysis process aims to capture and analyse discussions on Tripadvisor's Asia-Pacific forums about air pollution and its impact on travel choices, involves four main phases (Figure 2). The data processing flow begins with data acquisition using a Python script. The next phase involves data preparation, which involves removing all punctuations, converting text to lowercase, filtering out common and insignificant words, and applying the Porter stemming algorithm (Willett, 2006), which reduces words to their base forms. The analysis phase performs word frequency and classification, concluding with data visualisation through word clouds.

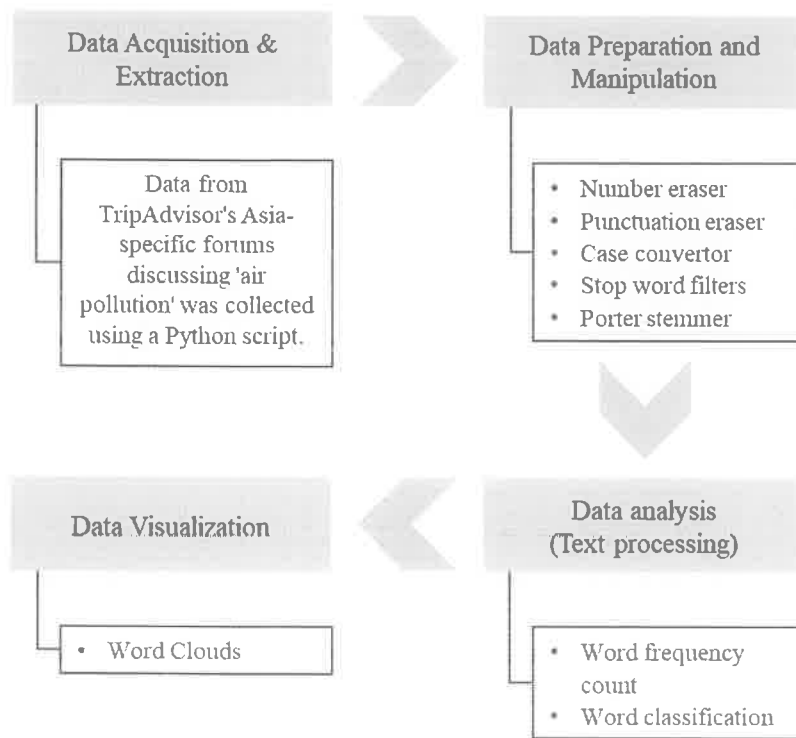


Figure 2. Text analysis process.

Measurement and questionnaire development

The measurement scales were primarily adopted from previous studies to ensure validity (Supplementary material 1). The dependent variable, traveller switching intention, was measured using four items adopted from Gitelson and Crompton (1984). For push factors, three items were borrowed from H. Zhang et al. (2018) to measure environmental policy, three items from Quan et al. (2023), and three items from Ajzen (1991) and Han (2015) were adopted to measure social norms. For pull factors, six items from Quan et al. (2023) measured health and well-being benefits, three items from Baloglu and McCleary (1999) and Stylos et al. (2016) measured destination image, and three items borrowed from Han (2015) measured personal norms.

For mooring factors, four items from de Groot and Steg (2008) and Han (2015) measured environmental value. Three items from Jung et al. (2017) and Olya and Han (2023) measured variety seeking, while three items retrieved from text analysis measured the opportunity loss – the travellers' concerns about the visibility at polluted destinations that may affect their travel experience. All items used a 7-point Likert scale from strongly disagree-1 to strongly agree-7, except for attitude towards air pollution, which applied six items on a semantic differential scale, with opposing poles, such as (1) bad to (7) good and (1) unpleasant to (7) pleasant. In addition, the fifth item for attitudes towards air pollution was reverse-coded to mitigate potential bias (Podsakoff et al., 2003).

The survey, initially designed in English, was translated into Korean using the translation-back-translation method to ensure accuracy (Brislin, 1983). Korean academicians fluent in their respective language and English carried out the translation. The translation versions were back-translated into English, and the original and back-translated questionnaires were compared by bilingual researchers to detect inconsistencies in translation. A pilot test was operationalised to evaluate the format, clarity of instructions and the scales, and the completion time, leading to the improvements in the opening

instructions regarding the clarity of polluted tourist destinations and adjustment in estimated completion time based on pilot response.

Online survey data collection procedure

A purposive sampling approach was used for the online survey. The respondents were international travellers who had travelled for leisure to the selected destinations with air pollution issues within the past five years. Data collection was conducted in June 2024. Data collection was operationalised through an online panel company in South Korea. The respondents were also pre-screened using options embedded in the data platform, which included criteria for questionnaire response quality and overseas tourism experience. The company provided quality control checks and monitoring to guarantee the reliability and validity of the data. After screening out the invalid responses – those that were completed exceptionally quickly or failed to answer the attention check questions, a total of 393 valid questionnaires were obtained.

Analytical technique

This study first assessed the reliability and validity of the measurements through confirmatory factor analysis (CFA), which allowed us to determine the goodness of fit of the measurement model. We next used structural model evaluation to assess the net effects of the dimensions of push, pull, and mooring factors on tourists' switching intentions to air pollution-free destinations. Necessary condition analysis was employed to identify the necessary antecedent conditions for high and low switching intentions. Finally, the study conducted a fuzzy-set qualitative comparative analysis (fsQCA) to determine the causal configurations that lead to high and low switching intentions. Data analysis was carried out using SPSS 23.0, AMOS 23.0, and fsQCA 4.1 software.

Results

User-generated content analysis

A total of 452 Tripadvisor reviews concerning air pollution in Asian destinations, spanning from January 2019 to February 2024, revealed significant trends and patterns (Supplementary material 2). The peak occurred in 2019 with 160 reviews, followed by a sharp decline in 2020 (77) and 2021 (20), due to COVID-19 travel restrictions. Reviews rebounded in 2022 (55) and surged in 2023 (112), with 28 reviews recorded by early 2024. January, October, and November consistently showed higher review counts, peaking in January 2020 (29), October 2019 (24), and November 2023 (16), reflecting seasonal variations. In contrast, May through July had lower review counts, possibly due to reduced travel or fewer pollution concerns, pointing to specific travel periods or pollution events during these months.

The analysis highlighted the connection between air pollution concerns and major tourist cities (Supplementary material 3). Bangkok (42 reviews) and Chiang Mai (41 reviews) were the top cities of concern. Hanoi received attention throughout the period (11 reviews), with mentions in all years, while Ho Chi Minh City's reviews were concentrated in 2019 and 2020 (4 reviews). Bali (6 reviews) was mentioned consistently, indicating ongoing air pollution concerns. Singapore received 10 reviews, reflecting concerns specific to the city – state. China, with significant mentions of Beijing and Shanghai, showed some consistency across the years but with fewer mentions compared to the peak years of 2019 and 2020.

Text mining of the dataset identified 62 words related to air pollution in Asian cities. Subsequent text analysis revealed key themes and concerns among travellers, as illustrated in Figure 3. A word cloud visually represents the frequency of words in a text dataset, with the size of each word indicating its frequency.

Words such as 'Visibility', 'Clear', 'See', and 'View' have been identified as closely associated with the risks and concerns surrounding travel experiences (Figure 3). Drawing from prior studies, opportunity loss is defined as the unfavourable outcomes travellers encounter during their trips (Cui et al., 2016; Holland et al., 2022). This study incorporates these UGC insights as measurement items to represent the dimension of opportunity loss as a mooring factor.

The sample consisted of 393 participants, with 189 males (48.1%) and 204 females (51.9%). Regarding age distribution, the majority of participants were between 51 and 60 years old (21.9%) followed by those 21 and 30 years old (20.4%). In terms of educational background, more than half of the respondents held an undergraduate degree (65.6%). As for monthly personal income, the majority of respondents had an income ranging from USD 2,000 to just under USD 4,000 (41.5%). The largest number of



participants with visit experience was 73 (18.6%) in the past 3–6 months. Finally, in terms of prior visitation frequency, nearly half of the respondents visited the site 1–2 times a year (48.3%) and a significant portion visited less than once a year, contributing to 38.4% (Supplementary material 4).

Reliability and validity

Based on Anderson and Gerbing's (1988) recommendations, confirmatory factor analysis (CFA) was employed using maximum likelihood estimation to assess the overall quality of the measurement model (Table 1). The CFA results indicated a good fit. All factor loadings exceeded the recommended threshold of 0.7, and Cronbach's alpha coefficients ranged from 0.860 to 0.912, indicating strong internal consistency for each construct. The average variance extracted (AVE) values for all the constructs were above the recommended threshold of 0.5 (Fornell & Larcker, 1981), with composite reliability (CR) values ranging from 0.78 to 0.95, all exceeding the suggested threshold of 0.60 (Bagozzi & Yi, 1988). Additionally, the descriptive statistics indicated reliable measurements, with skewness and kurtosis within acceptable ranges (Mardia, 1970), supporting the validity of the measurement model (Supplementary material 5). Harman's single-factor test revealed that the total variance explained amounted to 30%, below the 40% threshold, suggesting that common method variance did not significantly inflate the interpretation of this study (Harman, 1976).

Structural equation modelling (SEM)

The structural equation modelling (SEM) results in Figure 4 imply that the proposed model satisfactorily fits the data ($\chi^2 = 2087.817$, $df = 724$, $\chi^2/df = 2.884$, $p < .001$, RMSEA = .069, CFI = .881, IFI = .882, TLI = .872). Push factors have a significant and positive impact on switching intention ($\beta = .515$, $t = 8.504$, and $p < .001$). Pull factors have a significant and positive impact on switching intention ($\beta = .106$, $t = 2.124$, and $p < .05$). Mooring factors have a significant and positive impact on switching intention ($\beta = .431$, $t = 5.168$, and $p < .001$). Therefore, hypotheses 1, 2, and 3 were supported (Supplementary material 6).

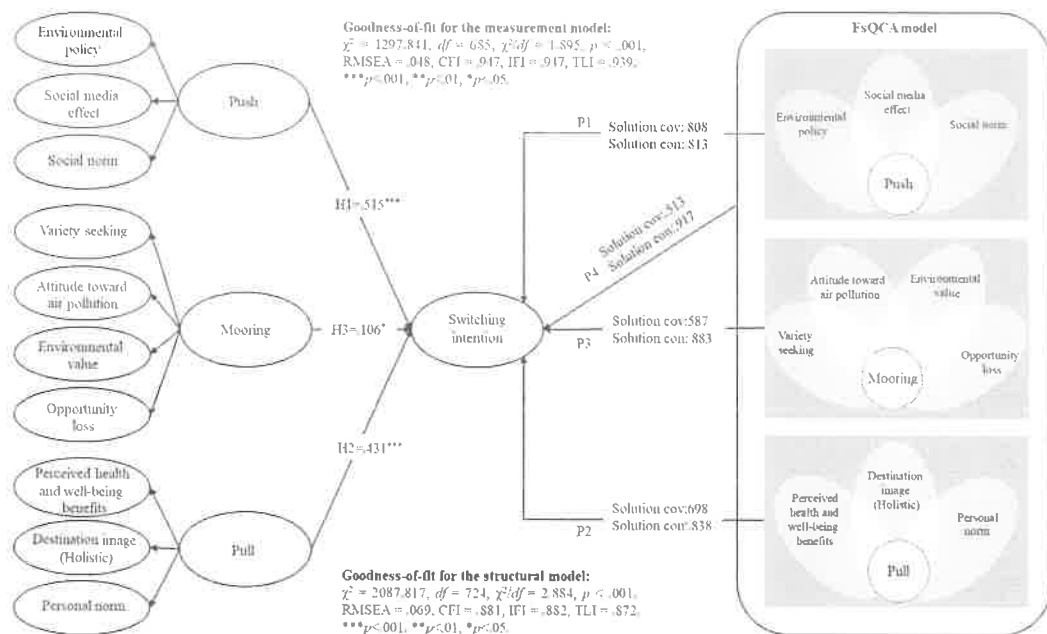


Figure 4. Results for the structural model.

Table 1. Results of the confirmatory factory analysis.

Constructs	SFL	Mean	Std. Deviation	Skewness (Std. Error)	Kurtosis (Std. Error)
Environmental policy ($\alpha=.860$)	EP1	.795	4.34	1.177	.252 (.123)
	EP2	.835	4.26	1.063	.279 (.123)
	EP3	.834	4.18	1.198	.152 (.123)
Social media effect ($\alpha=.873$)	SM1	.817	5.10	1.134	-.285 (.123)
	SM2	.809	4.80	1.276	-.318 (.123)
	SM3	.783	4.98	1.134	-.393 (.123)
Social norm ($\alpha=.909$)	SN1	.855	5.04	1.146	-.372 (.123)
	SN2	.866	4.94	1.199	-.395 (.123)
	SN3	.833	4.90	1.220	-.318 (.123)
Variety seeking ($\alpha=.874$)	VS1	.787	5.32	1.112	-.345 (.123)
	VS2	.900	5.30	1.096	-.442 (.123)
	VS3	.824	5.26	1.035	-.292 (.123)
Attitude towards air pollution ($\alpha=.888$)	AP1	.856	4.92	1.145	-.281 (.123)
	AP2	.887	4.99	1.173	-.300 (.123)
	AP3	.871	4.72	1.201	-.055 (.123)
	AP4	.885	5.03	1.219	-.505 (.123)
	AP5	.705	4.46	1.201	.194 (.123)
Environmental value ($\alpha=.912$)	EV1	.865	5.56	1.024	-.327 (.123)
	EV2	.911	5.66	1.083	-.457 (.123)
	EV3	.904	5.72	1.038	-.468 (.123)
	EV4	.878	5.72	1.072	-.538 (.123)
Opportunity loss ($\alpha=.912$)	OL1	.899	4.45	1.414	-.250 (.123)
	OL2	.950	4.59	1.442	-.433 (.123)
	OL3	.918	4.64	1.411	-.386 (.123)
Perceived health and well-being benefits ($\alpha=.862$)	HW1	.719	5.32	.983	-.181 (.123)
	HW2	.811	4.91	1.044	.068 (.123)
	HW3	.748	4.61	1.111	.090 (.123)
	HW4	.791	5.26	.948	-.208 (.123)
	HW5	.825	4.97	1.015	-.287 (.123)
Destination image (Holistic) ($\alpha=.881$)	DI1	.901	5.23	.886	-.155 (.123)
	DI2	.890	5.15	.962	-.154 (.123)
	DI3	.907	5.26	.990	-.170 (.123)
	DI4	.890	5.15	.962	-.154 (.123)
Personal norm ($\alpha=.895$)	PN1	.744	4.94	1.153	-.322 (.123)
	PN2	.761	4.94	1.157	-.318 (.123)
	PN3	.763	4.92	1.180	-.370 (.123)
Switching intention ($\alpha=.887$)	SI1	.708	5.20	1.078	-.412 (.123)
	SI2	.785	5.03	1.110	-.168 (.123)
	SI3	.826	4.98	1.096	-.128 (.123)
	SI4	.806	4.92	1.127	-.204 (.123)

Goodness-of-fit statistics:

$\chi^2 = 1297.841$, $df = 685$, $\chi^2/df = 1.895$, $p < .001$, RMSEA = .048, CFI = .947, IFI = .947, TLI = .939.

Note: SFL is Standardised factor loadings, α is Cronbach's alpha representing internal consistency. RMSEA = root mean square error of approximation; CFI = confirmatory fit index; IFI = incremental fit index; TLI = non-normed fit index.

Results of necessary condition analysis

This study used fuzzy-set qualitative comparative analysis (fsQCA) to perform a necessary condition analysis on all data. According to (Dul, 2016), a consistency value of 0.9 or higher is typically considered an indicator of a necessary condition. As shown in Table 2, the results indicated that there is no single necessary prerequisite for the intention to switch to air pollution-free destinations. However, we observed antecedents with consistency scores above 0.80. This suggests that these antecedents are likely to significantly impact the formation of high or low switching intentions. Specifically, high levels of social media influence, social norms, and personal norms contributed to the formation of strong switching intentions to some extent. Conversely, low levels of social media influence led to the formation of weak switching intentions to some extent.

Table 2. Necessary condition analysis of outcome.

Antecedent conditions	Outcome condition			
	Switching intention (SI)		~ Switching intention (~SI)	
	Consistency	Coverage	Consistency	Coverage
EP	0.773	0.683	0.695	0.620
~EP	0.569	0.649	0.644	0.741
SM	0.808	0.813	0.525	0.534
~SM	0.537	0.529	0.816	0.811
SN	0.806	0.785	0.573	0.563
~SN	0.551	0.561	0.781	0.803
VS	0.745	0.747	0.578	0.585
~VS	0.585	0.579	0.749	0.748
AP	0.665	0.686	0.618	0.643
~AP	0.655	0.629	0.699	0.678
EV	0.790	0.771	0.534	0.526
~EV	0.515	0.523	0.768	0.786
OL	0.764	0.748	0.600	0.592
~OL	0.583	0.591	0.744	0.761
HW	0.725	0.741	0.574	0.592
~HW	0.601	0.583	0.749	0.733
~DI	0.767	0.711	0.631	0.590
DI	0.557	0.599	0.690	0.750
PN	0.802	0.791	0.568	0.566
~ PN	0.560	0.563	0.790	0.801

Note: EP: environmental policy, SM: social media effect, SN: social norm, VS: variety seeking, AP: attitude towards air pollution, EV: environmental value, OL: opportunity loss, HW: perceived health and well-being benefits, DI: destination image (Holistic), PN: personal norm. ~ indicates negation condition.

Results of the fsQCA

To explore the complex and asymmetrical relationships between outcomes and their antecedents, fsQCA was used in this study, following the recommendations of Pappas and Woodside (2021). fsQCA enables the analysis of the sufficient configurations of antecedents leading to high switching intention (SI) and low switching intention (~SI). The solution coverage and consistency levels of the overall configurations exceeded the recommended thresholds of 0.2 and 0.8, respectively (Ragin, 2008). The configuration patterns clarify the effective pathways by which push, pull, and mooring factors contribute to the formation of strong switching intentions, as shown in Table 3. For the push factors, one optimal combination was identified (coverage: 0.808, consistency: 0.813). Two configurations indicated that the scores for ~SI had a coverage of 0.367 and a consistency of 0.945. Regarding the pull factors, the results revealed two configuration schemes (coverage: 0.698, consistency: 0.838). Similarly, two configurations indicated that the scores for ~SI had a coverage of 0.686 and a consistency of 0.864. For the mooring factors, two causal models suggested that the best combination had a coverage of 0.587 and a consistency of 0.883. Moreover, one configuration was identified for ~SI (coverage: 0.534, consistency: 0.949). Therefore, propositions 1, 2, and 3 were supported.

All combinations of antecedent configurations led to the formation of high switching intentions. Three causal configurations were identified as contributing to the development of high switching intention (coverage: 0.513, consistency: 0.917), as shown in Table 4. Similarly, two of these causal configurations predicted ~SI (coverage: 0.462, consistency: 0.935). Therefore, proposition 4 was supported.

Discussion and conclusion

This study aimed to explore the factors and configurations of conditions that influence travellers' intention to switch to air pollution-free destinations based on the PPM model. Through the application of this model, various antecedents, including personal, destination, and social attributes were incorporated into the factors. Environmental policy and the social media effect in the push

Table 3. Sufficient configurations of push, pull, and mooring factors leading to switching intention.

Models for switching intention	Raw coverage	Unique coverage	Consistency
<i>Causal models for high switching intention</i>			
Model A: $SI = f(EP, SM, SN)$			
M1: SM	0.808	0.808	0.813
Solution coverage: 0.808			
Solution consistency: 0.813			
<i>Causal models for low switching intention</i>			
Model ~A: $\sim SI = f(EP, SM, SN)$			
M1: $EP \sim SM$	0.254	0.042	0.958
M2: $\sim SM \sim SN$	0.276	0.063	0.953
Solution coverage: 0.367			
Solution consistency: 0.945			
<i>Causal models for high switching intention</i>			
Model B: $SI = f(HW, DI, PN)$			
M1: $HW \sim PN$	0.620	0.051	0.861
M2: $DI \sim PN$	0.647	0.078	0.845
Solution coverage: 0.698			
Solution consistency: 0.838			
<i>Causal models for low switching intention</i>			
Model ~B: $\sim SI = f(HW, DI, PN)$			
M1: $\sim DI \sim PN$	0.598	0.048	0.885
M2: $\sim HW \sim PN$	0.638	0.088	0.874
Solution coverage: 0.686			
Solution consistency: 0.864			
<i>Causal models for high switching intention</i>			
Model C: $SI = f(VS, AP, EV, OL)$			
M1: $\sim AP \sim EV \sim OL$	0.446	0.084	0.885
M2: $VS \sim EV \sim OL$	0.503	0.141	0.901
Solution coverage: 0.587			
Solution consistency: 0.883			
<i>Causal models for low switching intention</i>			
Model ~C: $\sim SI = f(VS, AP, EV, OL)$			
M1: $\sim VS \sim EV \sim OL$	0.534	0.534	0.949
Solution coverage: 0.534			
Solution consistency: 0.949			

Note 1: M stands for model. $\sim$ indicates negation condition.

Note 2: EP: environmental policy, SM: social media effect, SN: social norm, VS: variety seeking, AP: attitude towards air pollution, EV: environmental value, OL: opportunity loss, HW: perceived health and well-being benefits, DI: destination image (Holistic), PN: personal norm, SI: switching intention.

factors, perceived health and well-being benefits and destination image in the pull factors, and variety seeking and strong environmental values in the mooring factors are significant predictors of traveller switching intention. The integration of structural equation modelling (SEM) with user-generated content (UGC) and fuzzy-set qualitative comparative analysis (fsQCA) provides a novel methodological lens to understand how push factors overwhelmingly influence switching intentions, underscoring the dominance of preventive travel decisions in environmentally adverse conditions. The findings confirmed previous studies wherein air pollution serves as a strong preventive factor, encouraging travellers to switch to destinations with better air quality and acting as a crucial determinant in travel intention (Balcar & Šulák, 2021; Becken et al., 2017). Pull factors positively influence switching intentions to a lesser extent than push factors. Although the appeal of cleaner destinations can attract travellers, the avoidance of polluted environments is a more powerful factor. This dominance of push factors suggests that environmental risks act as a primary determinant, aligning with broader theories of risk aversion and negative stimulus avoidance in travel behaviour (Cao et al., 2024; Han, 2015).

The UGC analysis of Tripadvisor reviews in major Asian destinations revealed that travellers were highly aware of and concerned about air quality when planning their trips. The temporal patterns, with significant review activity during certain months, suggest that air pollution is a seasonal issue that greatly influences travel planning. This seasonal sensitivity aligns with the push factors,

Table 4. Sufficient configurations of all factors leading to switching intention.

Models for switching intention	Raw Coverage	Unique Coverage	Consistency
<i>Causal models for high switching intention</i>			
Model D: $SI = f(EP, SM, SN, VS, AP, EV, OL, HW, DI, PN)$			
M1: $EP*SM*SN*VS*EV*HW*DI*PN$	0.411	0.057	0.938
M2: $EP*SM*SN*VS*OL*HW*DI*PN$	0.386	0.032	0.950
M3: $\sim EP*SM*SN*\sim VS*\sim AP*EV*OL*\sim HW*\sim DI*PN$	0.239	0.069	0.930
Solution coverage: 0.513			
Solution consistency: 0.917			
<i>Causal models for low switching intention</i>			
Model $\sim D$: $\sim SI = f(EP, SM, SN, VS, AP, EV, OL, HW, DI, PN)$			
M1: $\sim SM*\sim SN*\sim VS*\sim EV*\sim OL*\sim HW*\sim DI*\sim PN$	0.415	0.252	0.972
M2: $EP*SM*SN*VS*\sim AP*\sim EV*OL*HW*DI*PN$	0.209	0.047	0.904
Solution coverage: 0.462			
Solution consistency: 0.935			

Note 1: M stands for model. $\sim$ indicates negation condition.

Note 2: EP: environmental policy, SM: social media effect, SN: social norm, VS: variety seeking, AP: attitude towards air pollution, EV: environmental value, OL: opportunity loss, HW: perceived health and well-being benefits, DI: destination image (Holistic), PN: personal norm, SI: switching intention.

where unfavourable environmental conditions, such as 'Pollution' or 'Air quality', prompt travellers to avoid certain destinations during peak pollution periods. Additionally, specific cities, particularly in Thailand and Vietnam, are frequently mentioned for their air pollution problems, which may explain the stronger push effects observed in these regions. Moreover, frequent mentions of terms such as 'Smog' and 'Haze' illustrate the significant concern about air pollution on the travel experience, emphasising the critical role of opportunity loss within mooring factors, as travellers seek destinations that minimise visual and health-related disruptions.

The causal configurations that lead to high and low switching intentions were explored through fsQCA. There is no single necessary condition that drives traveller switching intention; instead, multiple configurations of push, pull, and mooring factors can lead to the same outcome. The combination of high levels of social media effect, social norms, and personal norms contributed to the formation of strong switching intentions. A lack of these factors might result in low switching intentions. The equifinality observed in the fsQCA findings underscores the complexity of decision-making in the context of destination with air pollution challenges. The different combinations of causal conditions demonstrated that travellers may achieve the same outcome of high switching intention through varied combinations of factors, enriching the application of the PPM model.

Theoretical implications

This study enriches the existing literature on air pollution in the tourism context in the following way. First, the findings extend the PPM model by integrating environmental dimensions, particularly highlighting how push factors, such as air pollution, overshadow pull factors in influencing traveller decisions. This challenges traditional applications where pull factors often dominate. This current study complements previous research that predominantly focused on either push or pull factors affecting destination management and excluded social attributes (Becken et al., 2017; Cao et al., 2024; McKercher et al., 2015; Tang et al., 2019). The current study incorporated personal, destination, and social attributes, capturing both psychological and environmental dimensions and providing a holistic understanding of the antecedents of traveller switching intentions. Second, the sentimental perspective of traveller experiences at polluted destinations was extracted through UGC analysis, offering empirical evidence on the temporal perspective regarding awareness and seasonal variations in air pollution across key Asian tourism cities. This analysis complements findings on the non-linear pattern of air pollution's impact on the tourism economy (Qiang et al., 2024). Additionally, the UGC findings also complement the existing measurement items for mooring factors – opportunity loss. Third, a deeper insight into PPM factors influencing switching intentions was revealed

through the integration of UGC and fsQCA, expanding the understanding of traveller behaviour. The fsQCA results demonstrate the equifinality of traveller switching pathways, suggesting that diverse configurations of psychological, environmental, and social factors can lead to similar outcomes. This supports the flexibility and adaptability of the PPM model in explaining complex traveller decisions.

Practical implications

The findings from this study provide several implications for destination marketers and policymakers. The strategies to promote air pollution-free destinations should be multifaceted, targeting the multiple factors of push, pull, and mooring. For example, campaigns that highlight the health benefits of clean air (push), showcase the unique attractions of the destination (pull), and reinforce social norms around environmental responsibility (mooring) could be particularly effective. Tourism boards and destination marketers should leverage UGC platforms, such as Tripadvisor, to monitor traveller sentiment in real-time, adapting marketing campaigns to emphasise cleaner air seasons or indoor attractions during high-pollution months. Destination marketers should also introduce public recognition programmes to promote social norms, such as offering rewards for travellers who engage in air pollution-free activities. For destinations facing air pollution challenges, seasonal marketing strategies should be applied regarding the seasonal patterns of air pollution by, for example, promoting indoor tourism activities and entertainment opportunities. As confirmed by the current findings and previous studies, air pollution is a regional challenge with transboundary effects on neighbouring countries (Cha et al., 2023; Wei-Ching, 2023; X. L. Xu et al., 2023). Therefore, policymakers should prioritise cross-border collaborations to tackle transboundary air pollution, such as forming regional partnerships to enforce stricter environmental standards and mitigate the shared burden of pollution across neighbouring destinations.

Limitations and future research

This study focuses on Asian destinations could limit the generalizability of the findings. Future research should consider expanding the geographical scope and incorporating longitudinal designs to examine how changes in air quality influence travel behaviour over time. Additionally, this study employed content analysis of travellers' review on Tripadvisor and a survey of Korean travellers, who visited Asian destinations affected by air pollution, to reflect the impact of air pollution on traveller behaviour. Future research could further explore the perspective of tourists, focusing on the understanding of air pollution and how varying perceptions of air pollution influence their travel decisions by considering the factors that could moderate their behaviour, such as tourists' nationality and destination types. This study collected a temporal sentiment perspective regarding air pollution; however the analysis may have been constrained by the availability of data that depends on the seasonal variation of air pollution. Future research should explore how seasonal changes affect switching intention by performing separate analyses for different seasons or time periods to identify specific patterns of air pollution. Moreover, investigating the role of emerging environmental policies and their impact on traveller behaviour would provide valuable insights for both theoretical development and practical applications.

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Evidence of Participation in Academic Work Form 1

A. Title of Work: Promoting tourists' sustainable transportation use, walking tour and recycling activities for air pollution minimization at overseas urban tourism destinations

B. Applicant's Status in the Work:

☐ First author: Heesup Han

☐ Essentially intellectual contributor: N/A

☒ Corresponding author: Surarak Wichupankul

C. Type of Work:

Group 1: ☒ Research

Group 2: Other Academic Works

☐ Academic Work for Industry

☐ Case Study

☐ Academic Work for Teaching and Learning Development ☐ Translation Work

☐ Academic Work for Public Policy Development

☐ Innovation

☐ Scientific and Technological Creative Work

☐ Software

☐ Dictionary, Encyclopedia, Index, or Similar Academic Work

☐ Aesthetic and Artistic Creative Work

Group 3: ☐ Academic Work for Social Service

Group 4: ☐ Textbook

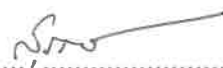
☐ Book

☐ Academic Article

Signature: 

(Heesup Han)

First Author

Signature: 

(Surarak Wichupankul)

Corresponding Author

Section 1: Details of Contribution

Details of Contribution	Role and Responsibilities:
A. Idea and Hypothesis:	Surarak Wichupankul and Prof. Heesup Han initiated the research idea, designed the hypotheses, and theoretical framework.
B. Research Operation, Participation in Design, Experiments, Testing, Measurement Tools, Data Collection Methods, and Criteria:	Prof. Heesup Han, Wai Ching Wilson Au, and Kee Fu Nelson Tsang designed the analytical framework and specified the data characteristics.
C. Data Collection, Data Analysis, and Interpretation:	Surarak Wichupankul collected and managed the quantitative data from Chinese respondents. Prof. Heesup Han collected and managed the quantitative data from Korean respondents. Nichapat Sangkaew collected and analyzed the qualitative data. Xin Cheng analyzed the quantitative data and prepared the visualizations.
D. Critique of Results, Comparison with Previous Conclusions, or Knowledge or Theory:	Surarak Wichupankul wrote the discussion and conclusion sections. Prof. Heesup Han provided validation and approved the final draft.
E. Participation in Writing the Manuscript, Creative Work, Innovation, Invention, etc.:	Surarak Wichupankul also arranged, compiled, and proofread the manuscript before submission. Wai Ching Wilson Au and Kee Fu Nelson Tsang wrote the introduction and literature review sections and provided initial feedback on the first draft. Surarak Wichupankul and Nichapat Sangkaew revised the manuscript based on reviewers' feedback.
F. Research Funding, IRB:	This research project was supported by the Faculty of Hospitality and Tourism, Prince of Songkla University (No. FSI6704118 S) as part of the Fast Track 2024 Program. IRB: psu.pk.009/2024 (exemption)

Signature: 

(Heesup Han)

First Author

Signature: 

(Surarak Wichupankul)

Corresponding Author

Section 2 Details of the Presentation, Technology Transfer, or Knowledge Transfer
(Supporting documents must be attached for consideration)

A. Publication in Journal:

Journal of Hospitality and Tourism Insights

ISSN: 2514-9792 E-ISSN: 2514-9806

Cite Score 2024: 8.3

SJR 2024: 1.134

SNIP 2024: 1.674

For more information:

<https://www.scopus.com/sourceid/21101045767>

<https://doi.org/10.1108/JHTI-03-2025-0336>

B. Patent Type and Year of Issuance (Specify country coverage):

None

C. If it is a technical report or research report, who is the user?

None

D. Dissemination through Poster Presentation or Oral Presentation (Please specify session, e.g., Plenary Symposium, Oral Session) or Abstract in Conference or Exhibition (Conference/Exhibition name, venue, and country):

None

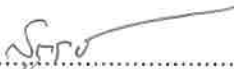
E. History of Research Grants Related to This Work:

This research project was supported by the Faculty of Hospitality and Tourism, Prince of Songkla University (No. FSI6704118 S) as part of the Fast Track 2024 Program (under the project titled “Tourist Destination and Pollution”).

F. If the research has been transferred into technology, what was the licensing fee received by the researcher (Please provide contract evidence)?

None

Note: For items A-F, if any evidence exists, please attach it to this document.

Signature:


(Surarak Wichupankul)

Applicant

Signature:


(Heesup Han)

First Author

Signature:


(Surarak Wichupankul)

Corresponding Author

Evidence of Participation in Academic Work Form 2

A. Title of Work: Exploring traveller willingness to shift towards air pollution-free destinations: developing the multiple configurations of push, pull, and mooring factors

B. Applicant's Status in the Work:

☐ First author: Nichapat Sangkaew

☐ Essentially intellectual contributor: N/A

☐ Corresponding author: Heesup Han

☒ Co-author: Surarak Wichupankul

C. Type of Work:

Group 1: ☒ Research

Group 2: Other Academic Works

☐ Academic Work for Industry

☐ Case Study

☐ Academic Work for Teaching and Learning Development ☐ Translation Work

☐ Academic Work for Public Policy Development

☐ Innovation

☐ Scientific and Technological Creative Work

☐ Software

☐ Dictionary, Encyclopedia, Index, or Similar Academic Work

☐ Aesthetic and Artistic Creative Work

Group 3: ☐ Academic Work for Social Service

Group 4: ☐ Textbook

☐ Book

☐ Academic Article

Signature: 

(Nichapat Sangkaew)

First Author

Signature: 

(Heesup Han)

Corresponding Author

Signature: 

(Surarak Wichupankul)

Co-Author

Section 1: Details of Contribution

Details of Contribution	Role and Responsibilities:
A. Idea and Hypothesis:	Surarak Wichupankul designed the conceptual framework and study hypotheses. Nichapat Sangkaew and Prof. Heesup Han initiated the research idea.
B. Research Operation, Participation in Design, Experiments, Testing, Measurement Tools, Data Collection Methods, and Criteria:	Prof. Heesup Han and Xin Cheng designed the analytical process and specified the data characteristics.
C. Data Collection, Data Analysis, and Interpretation:	Surarak Wichupankul collected the data, wrote, and interpreted the findings. Nichapat Sangkaew and Xin Cheng conducted the analysis, prepared the visualizations, and interpreted the findings.
D. Critique of Results, Comparison with Previous Conclusions, or Knowledge or Theory:	Surarak Wichupankul wrote the literature review, discussion, and conclusion sections. Prof. Heesup Han wrote the introduction section.
E. Participation in Writing the Manuscript, Creative Work, Innovation, Invention, etc.:	Surarak Wichupankul and Nichapat Sangkaew were responsible for revising the manuscript in response to the reviewers' feedback. Prof. Heesup Han provided validation and approved the final draft.
F. Research Funding/ IRB:	This research project was supported by the Office of the Ministry of Higher Education, Science, Research and Innovation under the Reinventing University System/Visiting Professor Program (2024). IRB: psu.pk.009/2024 (exemption)

Signature: 

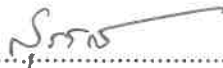
(Nichapat Sangkaew)

First Author

Signature: 

(Heesup Han)

Corresponding Author

Signature: 

(Surarak Wichupankul)

Co-Author

Section 2 Details of the Presentation, Technology Transfer, or Knowledge Transfer
(Supporting documents must be attached for consideration)

A. Publication in Journal:

Current Issues in Tourism

ISSN: 1368-3500 E-ISSN: 1747-7603

Cite Score 2024: 15.5

SJR 2024: 1.703

SNIP 2024: 2.233

For more information:

<https://www.scopus.com/sourceid/28324>

<https://doi.org/10.1080/13683500.2025.2462189>

B. Patent Type and Year of Issuance (Specify country coverage):

None

C. If it is a technical report or research report, who is the user?

None

D. Dissemination through Poster Presentation or Oral Presentation (Please specify session, e.g., Plenary Symposium, Oral Session) or Abstract in Conference or Exhibition (Conference/Exhibition name, venue, and country):

None

E. History of Research Grants Related to This Work:

This research project was supported by the Office of the Ministry of Higher Education, Science, Research and Innovation under the Reinventing University System/Visiting Professor Program.

F. If the research has been transferred into technology, what was the licensing fee received by the researcher (Please provide contract evidence)?

None

Note: For items A-F, if any evidence exists, please attach it to this document.

Signature: 
(Surarak Wichupankul)
Applicant

Signature: 
(Nichapat Sangkaew)
First Author

Signature: 
(Heesup Han)
Corresponding Author

Signature: 
(Surarak Wichupankul)
Co-Author

เอกสารชี้แจงจริยธรรมและจรรยาบรรณทางวิชาการ

การชี้แจงจริยธรรมและจรรยาบรรณทางวิชาการในผลงานทางวิชาการ 1

ชื่อผลงาน: Promoting tourists' sustainable transportation use, walking tour and recycling activities for air pollution minimization at overseas urban tourism destinations.

Han, H., Sangkaew, N., Cheng, X., Au, W. C. W., Tsang, K. F. N., & Wichupankul, S. (2025). Promoting tourists' sustainable transportation use, walking tour and recycling activities for air pollution minimization at overseas urban tourism destinations. Journal of Hospitality and Tourism Insights. <https://doi.org/10.1108/JHTI-03-2025-0336>

คำชี้แจง: งานวิจัยชุดนี้ได้รับการยกเว้น (Exemption) จากคณะกรรมการจริยธรรมการวิจัยในมนุษย์ของสถาบัน รหัส psu.pk.009/2024 ชื่อโครงการ Tourist Destination and Air Pollution รายละเอียดตั้งเอกสารแนบท้าย (Certificate of Approval)

ลงชื่อ 

(นางสาว สุรรักษ์ วิชชุปัญญากุล)

ผู้ขอกำหนดตำแหน่ง

19 มกราคม 2569



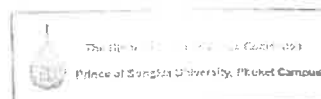
AF/15-04-v.02.0

Certificate of Approval
The Human Research Ethics Committee
Prince of Songkla University, Phuket Campus

Protocol No. : psu.pk 009/2024
ชื่อโครงการ: -
Protocol Title: Tourist Destination and Air Pollution
ชื่อหัวหน้าโครงการวิจัย: นางสาวณิชาพัชร สังข์แก้ว
Principle Investigator: Miss Nichapat Sangkaew
หน่วยงานที่สังกัด: คณะการบริการและการท่องเที่ยว มหาวิทยาลัยสงขลานครินทร์ วิทยาเขตภูเก็ต
Affiliation of PI: Faculty of Hospitality and Tourism, Prince of Songkla University, Phuket Campus
Co-investigators: Miss Surarak Wichupankul
Review Method: Exemption
Documents Acceptances:
1. AF/02-04-v.03.0 4. AF/10-04-v.02.0
2. AF/03-04-v.02.0 5. Proposal
3. AF/06-04-v.03.0 6. Questionnaire

have been reviewed by the Human Research Ethics Committee in full compliance with the Declaration of Helsinki and the Belmont Report.

Assistant Professor Dr. Rattana Wetprasit
Chairman of Human Research Ethics Committee



Date of Approval: 25 April 2024
Date of Expiration: 25 April 2025

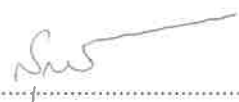
เอกสารชี้แจงจริยธรรมและจรรยาบรรณทางวิชาการ

การชี้แจงจริยธรรมและจรรยาบรรณทางวิชาการในผลงานทางวิชาการ 2

ชื่อผลงาน: Exploring traveller willingness to shift towards air pollution-free destinations: developing the multiple configurations of push, pull, and mooring factors.

Sangkaew, N., Wichupankul, S., Cheng, X., & Han, H. (2025). Exploring traveller willingness to shift towards air pollution-free destinations: developing the multiple configurations of push, pull, and mooring factors. Current Issues in Tourism, 1-19. <https://doi.org/10.1080/13683500.2025.2462189>

คำชี้แจง: งานวิจัยชุดนี้ได้รับการยกเว้น (Exemption) จากคณะกรรมการจริยธรรมการวิจัยในมนุษย์ของสถาบัน รหัส psu.pk.009/2024 ชื่อโครงการ Tourist Destination and Air Pollution รายละเอียดตั้งเอกสารแนบท้าย (Certificate of Approval)

ลงชื่อ 

(นางสาว สุรรัชช์ วิชชุปัญญากุล)

ผู้ขอกำหนดตำแหน่ง

19 มกราคม 2569

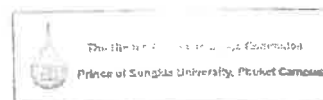


Certificate of Approval
The Human Research Ethics Committee
Prince of Songkla University, Phuket Campus

Protocol No. : psu.pk 009/2024
ชื่อโครงการ: -
Protocol Title: Tourist Destination and Air Pollution
ชื่อหัวหน้าโครงการวิจัย: นางสาวนิชาพัชร สังข์แก้ว
Principle Investigator: Miss Nichapat Sangkaew
หน่วยงานที่สังกัด: คณะการบริการและการท่องเที่ยว มหาวิทยาลัยสงขลานครินทร์ วิทยาเขตภูเก็ต
Affiliation of PI: Faculty of Hospitality and Tourism, Prince of Songkla University, Phuket Campus
Co-investigators: Miss Surarak Wichupankul
Review Method: Exemption
Documents Acceptances:
1. AF/02-04-v.03.0 4. AF/10-04-v.02.0
2. AF/03-04-v.02.0 5. Proposal
3. AF/06-04-v.03.0 6. Questionnaire

have been reviewed by the Human Research Ethics Committee in full compliance with the Declaration of Helsinki and the Belmont Report.

Assistant Professor Dr. Rattana Wetprasit
Chairman of Human Research Ethics Committee



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