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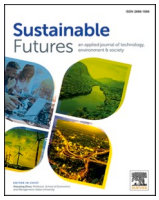

Storytelling, humour, and promotions: How social media marketing influences university students' green purchase intention

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ABSTRACT

This study explains how social media information sources, formats, and promotions affect Chinese university students' inclinations to engage with social media and make environmentally friendly purchases. Multivariate analysis of variance (MANOVA) was used to validate Study 1, analysis of variance (ANOVA) was used to validate Study 2, and PROCESS Model 4 was used to evaluate the mediation functions of attitude and conceptual fluency. The results indicate that firm-generated content (FGC) is more effective than user-generated content (UGC) in terms of university students' engagement - specifically liking (L), sharing (S), and commenting (C) - as well as in fostering green purchase intentions (GPI), particularly with firm-generated storytelling content (FGCS). The mediating role of attitude demonstrates partial or full mediation, except for firm-generated humour content (FGCH), which did not show a significant effect on GPI, but the two promotional modes are not significant difference, however, through the mediating effect of Concept Fluency (CF), half-price promotions can greatly increase the impact of FGCS and FGCH on GPI. This research (1) contributes to the body of knowledge already available on social media UGC versus FGC, and (2) illustrates how social media content type and provider affect consumers' intentions to make green purchases, and (3) illustrates the influence of branded content and promotional strategies on university student consumers. Overall, this study enables businesses to better understand how forms of green content marketing and promotional models can engage university students' consumers in social media interactions and generate green purchase intentions.

1. Introduction

Sustainable development and green consumerism have garnered heightened worldwide attention, propelled by escalating environmental concerns and the pressing necessity to confront climate-related difficulties [1,2]. China prioritises green development and sustainable consumption, having established a 'double carbon' target (i.e., peak carbon and carbon neutrality goals) as a crucial component of its national development strategy, thereby positioning green consumption as a primary focus for policy advancement and public awareness [3]. Green consumption is evolving from a concept into a tangible lifestyle, leading to major changes in consumer purchasing behaviour. Younger demographics exhibit significant engagement in green consumption, demonstrating heightened environmental awareness and a pronounced inclination towards sustainable consumption practices [4,5].

In the process of promoting green consumption, social media is playing an increasingly critical role as an important communication channel between brands and consumers [6]. Social media content marketing engages consumers through the creation and dissemination of informative information [7]. Social media serves as a conduit for information distribution and significantly shapes young people's consumer awareness and behavioural patterns through its interaction and engagement [8]. Particularly in China, studies have shown that social media has a significant impact on university students' green consumption behaviour [9], and the green information it disseminates enhances university students' willingness to practice environmentally friendly behaviours through the mechanisms of perceived value, environmental identity and social norms [10].

Although there have been studies exploring green purchasing behaviour from the perspective of consumer behaviour, research from the perspective of marketing strategy, particularly content marketing, is still relatively limited [11]. Content marketing has gradually evolved

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into a fundamental mode of contact and impact between brands and consumers, particularly now that social media has emerged as a major communication tool. According to Statista, global social media advertising expenditure is predicted to reach $243.6 billion by 2024, with China accounting for a sizable chunk of the market, totalling 846.5 billion yuan [12]. Meanwhile, the global number of social media users is increasing and is anticipated to approach 5.8 billion by 2029, with young people constituting most social media users [13].

Take China's popular social platform 'Xiaohongshu' as an example [14], as of 2019, its monthly active users have exceeded 100 million, of which post-1990s users accounted for up to 70 % [15]. The platform is praised for its content diversity and community interaction, which encourages users to share their consuming experiences through pictures, films, and other forms, resulting in a thriving user-generated content (UGC) ecosystem [16]. This type of contents is thought to be more authentic, believable, and less biassed [17], and it outperforms firm-generated content (FGC) in terms of improving brand sentiment and awareness, increasing social media engagement, and facilitating sales and purchase conversions [18,19]. Some research indicates that FGC has no positive effect on consumer attitudes and may possibly have a detrimental impact on purchase intentions [20]. However, existing research has shown that FGC is not always unsuccessful, and that FGC can go beyond simply displaying physical objects to alter consumers' online shopping experiences and increase purchases [21]. The usefulness of the two content types in diverse situations must be further evaluated and validated.

The expression of content also has an important impact on consumer behaviour. Emotional appeals, especially storytelling (S) and humorous expressions (H), have been widely used in social media advertisements and are especially appealing in the communication of green topics [22–24]. However, most of the existing studies are from the corporate perspective [25,26], and there is a lack of in-depth exploration of how storytelling or humour elements in user-generated content can stimulate consumer engagement and influence green purchase intentions.

Research has demonstrated that the format and publisher type of content presentation significantly influence consumer advertising attitude (ATT), which in turn influences the behavioural responses of consumers [27,28]. Based on this, this study compares the impact of different content sources (UGC vs. FGC) and formats (H vs. S) on advertising attitudes. It also examines how advertising attitudes influence user engagement metrics such as likes (L), shares (S), comments (C), and green purchase intentions (GPI).

Furthermore, to identify the most effective combinations of content strategies in different promotional contexts, this study incorporates various promotional strategies, such as buy-one-get-one-free (BF) and half-price (HP) offers, with the goal of providing companies with more targeted and effective green marketing communication recommendations. In today's competitive social media ecosystem, promotional methods have evolved into an essential component of content marketing [29]. Former studies on promotions cover various aspects, including limited-time and exclusive promotions [30], conditional value-based discounts and promotional incentives [31], and the impact of promotions on the consumption of eco-friendly products [32]. Promotional approaches were found to be effective in green product communication to stimulate consumers' desire to purchase, especially appealing to those who value health and sustainability [33]. However, the efficacy of content sources, content forms (S vs. H), and promotion effectiveness (BF vs. HP) has not been systematically validated, leaving a gap in current research.

To better understand the inherent mechanisms by which different promotional methods influence customer responses, this study adds conceptual fluency (CF) as a mediating variable. CF refers to an individual's cognitive smoothness in processing the semantic content of a stimulus; when previously presented information is semantically related to the current stimulus, it facilitates the individual's understanding and processing of the current information, thereby increasing its fluency [34]. In marketing communication, improved conceptual fluency means that consumers are more likely to understand and accept the message, which in turn may lead to more positive attitude and behavioural responses. This division helps to measure the difference in cognitive processing when consumers face the two different forms of promotion and provides theoretical support for explaining the effects of promotion.

In conclusion, there are still significant gaps in the following areas of current research: (1) research on the combination of content source and content form of social media content marketing is comparatively weak in the field of green consumption, particularly its limited empirical validation in the Chinese context; (2) promotional strategies and the "content source-content form" have not yet been examined in the existing literature, which should be examined in a stage-integrated research design.

To fill the above research gap, this study adopts two consecutive empirical research designs based on Stimulus-Organism-Response (SOR) theory to systematically explore the effective mechanisms of green marketing communication. Study 1 aimed to examine the effects of different publisher types (UGC vs. FGC) and content formats (S vs. H) on consumer responses such as L, S, C, and GPI, as well as to investigate the mediating role of ATT in identifying content strategies that are more effective in social media communication. Study 2 focusses on the types of content with greater communication potential identified in Study 1 and investigates the interaction effect between content and promotion in conjunction with two common promotional tactics–BF and HP–to determine the best combination of approaches to improve green consumer behaviour. Although these two promotional approaches have similar economic value, they may elicit different emotional responses and purchasing intention by influencing consumers' CF - that is, whether the promotional message is understood and processed smoothly - due to differences in expression and psychological perceptions. The mediating variable of CF is therefore introduced. Therefore, this study hopes to provide a theoretical basis and practical reference for green brands' content strategy and promotional mix in the social media environment.

Among the many sustainable products covered by green consumption, this study chooses organic food as a representative green product to be explored. On the one hand, organic food is closely related to the daily life of university students, and consumers have strong perceptions of its healthiness and environmental friendliness, which is suitable for experimental research as a typical context of green consumption behaviour [35]. On the other hand, the purchase decision of organic food is often significantly influenced by information presentation and content marketing and thus is very suitable for studying the effects of different content strategies on consumer behaviour [36]. Therefore, this study develops the design with organic food as the research focus.

The contribution of this study is mainly reflected in three aspects: first, it reveals the effects of different types of advertising content (including content source and content form) on consumers' interactive behaviours and their purchase intentions towards organic food; second, it identifies the best combination of content strategy and promotion methods under different promotional strategies (BF and HP), which provides empirical support for enhancing the marketing effectiveness of green products; Third, it provides a theoretical basis and practical guidance for the synergistic content and promotion strategies of organic food brands on social media. This study not only enriches the theory of green consumption communication but also provides a reference for green product brands to develop more targeted social media communication strategies, which can help promote the practice of green consumption behaviour and the widespread dissemination of sustainable concepts.

2. Literature review

2.1. The stimulus-organism-response (SOR) model

According to Mehrabian and Russell's [37] S-O-R framework,

external stimuli influence individuals (organisms), causing changes in behaviour and actions (responses) [38]. In marketing research, external stimuli (Stimulus) usually refer to marketing mix elements (such as product, price, promotion and distribution channels). Under the influence of the stimulus, the individual, as an 'organism' (Organism), will internally generate a series of psychological or emotional responses (e.g., cognitive judgement, attitude change), which in turn will trigger the final behavioural response (Response), such as the purchase intention of green products [39]. The S-O-R model is commonly used in consumer behaviour research [40,41]. In this study, the exposure and dissemination of green content in social media is considered as an external stimulus (S), which influences consumers' social media engagement as well as green purchase intentions (R) by affecting their attitudes (O). It has been shown that social media, as an environmental stimulus (Stimulus), can significantly influence consumer perceptions and emotions in the form of visual content, electronic word-of-mouth, and brand stories. For example, in the restaurant industry, the SOR model can effectively explain the relationship between social media marketing campaigns and users' purchase intention, premium payment, and electronic word-of-mouth, and its theoretical framework is well adapted to the social media context [42].The SOR framework is also applicable in the field of green consumption to reveal the psychological mechanisms of consumers, e.g. Krstić et al. [43] in exploring the impact of social media green advertisements on the purchase of eco-friendly clothing, found that green advertisements in the platforms can help consumers to identify with the environment by stimulating their Organism, which in turn promotes purchase behaviour. Especially among young consumers of Generation Z, green content in social media is more likely to stimulate their emotional resonance and value recognition, resulting in positive purchase responses [44]. In summary, SOR theory is not only applicable to explain consumers' responses to offline environmental stimuli, but also applicable to the process of spreading and influencing green information in online social media platforms. By introducing this theoretical framework, this paper can systematically reveal how social media green content drives consumers' green consumption behaviour by stimulating their internal psychological states. This theoretical framework provides strong support for exploring how social media marketing can drive young consumers' green consumption.

2.2. Firm-generated content and user-generated content

With the rise of social media, individuals as well as firms may now communicate freely online. UGC can be shared among users through the behaviours of L, C, and S. Simultaneously, users can express their perceptions of brands via social media. This interaction gives rise to both FGC and UGC, depending on the publisher. Previous research has shown that regular exposure to both UGC and FGC improves brand recall and perception [45]. According to Kumar and Pansari [46], FGC is defined as "marketing communications initiated by a company on its official social media pages, including both promotional and non-promotional messages that are not limited to generating short-term sales but also help to strengthen the bond between the customer and the company." The content of FGC is characterized by high professionalism and credibility, leading consumers to trust FGC more and exhibit more positive attitudes [47,48].

Compared to FGC, UGC is a more effective strategy for brands seeking to capture the attention of potential users. This approach leverages the inherent publishing capabilities of users, resulting in a higher level of subconscious trust. UGC is defined as original or non-original text, data, or content created by individual users on independent channels, without any constraints on format. The authenticity and reliability of UGC position it as a primary source of information for users [49,50] . Consequently, there is evidence that UGC is the most effective strategy for fostering consumer loyalty [51]. Additionally, the strength of UGC lies in its capacity to more effectively address consumer needs, bridging the gap between brands and customers through user recommendations that highlight relevant attributes [52].

L, S, and C forms represent specific expressions of user participation. The popularity of FGC and UGC is reflected in the indicators mentioned above. The effectiveness of UGC in fostering brand participation is not influenced by consumers' familiarity with the brand, whereas FGC tends to perform better for brands that are well-known [53]. Studies indicate that UGC is more effective at predicting likes and shares, while FGC has a more significant impact on user reviews [54]. In the context of promotional advertisements, UGC is preferred for recommendations [55].

Existing research indicates that both UGC and FGC positively influence the intention to adopt certain behaviours [56]. Specifically, UGC that promotes food experiences generates stronger action intentions than FGC content [57]. Conversely, for promotional content related to food, FGC tends to elicit higher purchase intentions compared to UGC [58]. Furthermore, unemployed consumers exhibit price sensitivity and demonstrate a stronger preference for FGC promotional messages [59].

2.3. Emotional appeal (S vs H) and rational appeal (HP vs BF)

To verify the influence of social media content dimensions on university students' green consumption, the content designed in this study uses two basic persuasive strategies, namely emotional appeals and rational appeals, which can influence recipients' emotions and perceptions [60] and have been widely used in the field of social advertising research [61,62].

Emotional appeals emphasise the hedonistic qualities of the good or service, while rational appeals focus on the practical advantages of the good or service [63], Further research has classified content containing reward features, such as discounts, as rational statements [64]. Consumers have both emotional and rational needs for social media content. Existing research suggests that entertainment and information seeking are the two main purposes for which consumers seek company-generated brand content [65]. Existing studies have found different results on the effectiveness of these two appeals: emotional appeal content is more likely to increase consumers' purchase intentions [66] and promote user engagement [67] than rational appeal content; however, in specific domains such as healthcare consumption, studies have shown that rational appeal content is more effective [68]. These two strategies have not been analysed in a cross-section of posting sources (companies or users). Therefore, this study invokes these two strategies in publishing content, where storytelling or humorous content is used to satisfy users' emotional needs, and half-price or buy-one-get-one-free discounts are used to represent the rational advantages of the product, in order to investigate how the interaction effect between the publishing source and the type of claim is manifested in the specific context of green consumption.

3. Study 1

3.1. Literature review

3.1.1. Emotional appeal (S vs H) and content sources (FGC vs UGC)

Entertainment content from both the FGC and UGC effectively attracts the participation of social media users [69]. For instance, users exhibit a greater enthusiasm for liking content [70]. As a result, content that expresses pleasant emotions has become a powerful communication tool for social media marketers.

Humour is recognized as an effective emotional strategy for eliciting positive emotions [71]. On social media platforms, humorous content is extensively utilized in brand promotion, making it one of the most popular strategies for enhancing brand personality [72]. Amusing expressions can satisfy the psychological demands of customers, lessen the perceived gap between the company and the customer, and subsequently promote the growth of favourable brand perceptions [73]. Furthermore, humorous content is more likely to capture users' interest, create a favourable brand experience, and encourage users to share or

comment, thereby amplifying the social communication impact of advertisements [74–77]. Additionally, humorous content can significantly influence users' purchase intentions [78,79]. This is especially relevant when it comes to green consumption, since comedy may help companies communicate environmental responsibility in a fun and easy way, increasing consumers' desire to buy green products [80]. Compared to UGCH, firm-generated humorous content (FGCH) may elicit additional positive feelings from consumers due to the lower expectations associated with humour in commercial contexts [81].

Telling stories to cultivate brand loyalty has positively impacted consumers [82]. The storytelling style increases user engagement and effectively develops a bond between the firm and individuals by incorporating relevant and emotionally engaging material. Companies can successfully evoke consumers' emotions and interest in the brand, thereby fostering a connection with customers [83]. Existing research indicates that storytelling content from companies can significantly improve consumers' brand attitudes [84], stimulate brand identification, emotional value, and participation behaviour [85]. User-generated storytelling content (UGCS) published by user accounts is regarded as a natural and effective content marketing strategy to engage potential users [86]. Engaging with UGCS enhances consumers' information cognition and fosters a more positive emotional experience, leading to improved brand attitudes [87]. UGCS can increase product appeal to potential customers, stimulate the sharing, promotion, and dissemination of advertisements [88], create electronic word-of-mouth [89], and affect purchasing behaviour [90].

Based on the previous description, the following assumptions are made:

H1. Compared to FGCS, UGCS will significantly improve a) L, b) S, and c) C in university students.

H2. Compared to UGCH, FGCH will significantly increase a) L, b) S, and c) C in university students.

H3. Compared to UGCS, FGCS will significantly increase the GPI of university students.

H4. Compared to UGCH, FGCH will significantly increase the GPI of university students.

3.1.2. The mediating role of attitude

Consumers' attitudes toward content largely influence their subsequent behavioural responses, thus becoming one of the core variables in social media advertising research [91,92]. Attitude not only measures an individual's preference for content but also reflects his or her affective tendencies in the process of receiving, evaluating and responding to information. It has been found that the information attributes contained in social media posts, such as informational value, emotional appeal, and entertainment, significantly affect people's overall perceptions of the post, which in turn affects their brand attitudes toward the company and their willingness to share the content [93]. Specifically, content forms with informative, entertaining, and humorous content are more likely to stimulate consumers' interest and positive emotions than ordinary messages, thus contributing to the formation of more positive advertising attitudes [94,95]. Further empirical studies have also validated the role of humour and dramatic narratives in stimulating positive advertising attitudes. For example, Kasilingam and Ajitha [96] found that humorous narrative advertisements are more likely to stimulate consumers' affective responses and have a stronger positive impact on advertising attitudes than dramatic narratives, and more notably, humorous narrative advertisements have a more significant effect on brand attitudes, suggesting that entertaining advertisement content not only enhances advertisement attitudes, but also indirectly strengthens brand impressions.

Attitude plays a key role as a mediating mechanism in both UGC and FGC contexts as well [97–99].UGC is more likely to elicit empathy and resonance than Firm-Generated Content (FGC).Studies have shown that positive attitudes towards UGC can reduce consumers' defensive cognitive responses to information and attenuate their scepticism or resistance, which in turn reduces negative assessments of the content and consequently increases acceptance of the brand and willingness to purchase [100].

In addition to its impact on purchase intention, ATT towards social media advertisements play a key mediating role between content type and interaction behaviour. It has been shown that the attitudes users hold towards social media posts significantly influence their interaction behaviours on the platforms, such as liking, commenting and sharing [101].

In both FGC and UGC, positive ATT helps to reduce consumers' psychological defences and increase their acceptance of information, thus enhancing communication motivation [102,103]. In conclusion, ATT not only connects the paths of information sources and purchase intentions but also has an impact on the relationship between information types and users' social behaviour.

H7. ATT will significantly enhance consumers' a) L, b) S, c) C, and d) GPI.

H8. ATT mediates between FGCS and a) L, b) S, c) C, and d) GPI.

H9. ATT mediates between FGCH and a) L, b) S, c) C, and d) GPI.

H10. ATT mediates between UGCS and a) L, b) S, c) C, and d) GPI.

H11. ATT mediates UGCH and a) L, b) S, c) C, and d) GPI.

3.2. Methodology

3.2.1. Research design

The purpose of this study is to investigate how different social media content affect consumer attitudes, social media involvement, and purchase intentions. A quantitative survey approach with a questionnaire was used for research design and data collection to meet the study's goals.

The experiment was conducted online, using the Wenjuanxing platform to distribute the experimental tasks. The questionnaires were divided into four according to the four stimulus conditions, and another questionnaire was uploaded after the completion of each of the four questionnaires. Each participant could only see the graphic and textual advertisement materials of one experimental condition, and there was no limit on the time of the stimulus presentation, so that the participants could browse freely. All participants completed the structured questionnaires immediately after reading the graphic stimuli, and the questionnaires took approximately 5–8 min in total. The experiment was conducted entirely online, with participants using a computer or mobile phone to complete the tasks, and the completion process was anonymous to ensure privacy.

This study employs a 2 (Content producer: Firm-generated vs. User-generated) × 2 (Content Type: Storytelling vs. Humour) between-subjects design) (Material as shown in Fig. 1). The impact of presentation format (image vs. video) on consumer engagement varies. Studies reveal that pictures on social media are more visually appealing than video content and is more likely to generate comments and shares from users [104]. Consequently, this study utilizes images combined with text as the advertising format. Xiaohongshu serves as the social media advertising platform, and the experimental materials are designed to resemble Xiaohongshu social media pages, resulting in the creation of four groups of test stimuli. To minimize product bias due to brand familiarity, this study focuses on an organic biscuit brand that is relatively unknown in the Chinese market. The image materials for the UGC and FGC are generated by AI and all the Xiaohongshu pages created by

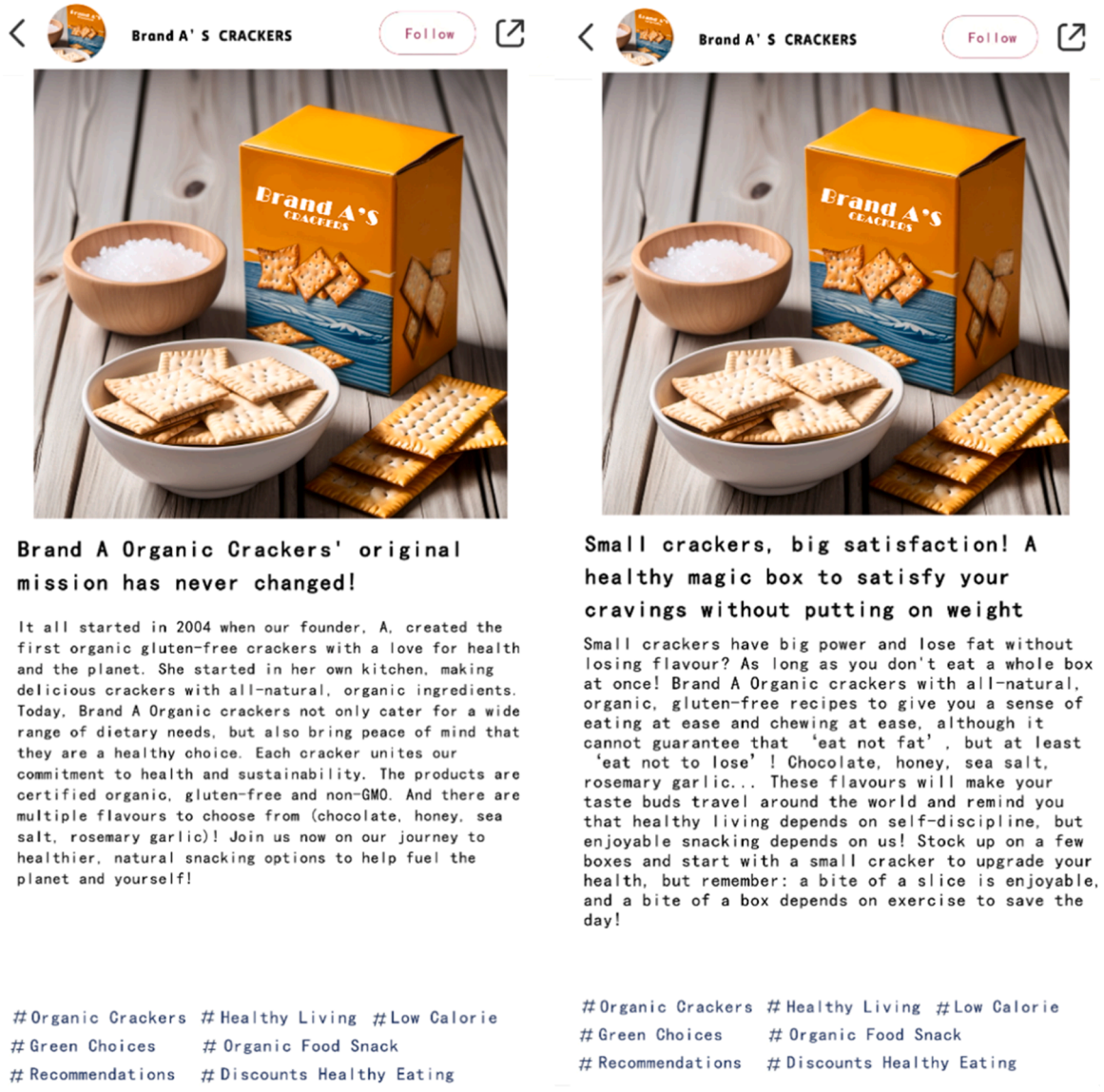

Fig. 1. Interaction effects of content producer type and content type.

Photoshop (Appendix 1 contains information about the stimulus material). These stimuli were systematically manipulated across the two dimensions of content source and content type, while ensuring consistency in product information. By rigorously controlling for other potential confounding variables, the internal validity of the results was upheld. Lastly, each of the four scenarios was assigned to participants at random. The study has been approved by the Ethics Committee of New Energy and Intelligent Networked automobile College of University of Sanya (approval number is: USY20240617). Before taking part in the study, all participants were told about its nature and objective. Informed consent was obtained in writing using an online questionnaire platform. Participants willingly volunteered to participate in the study, and their replies were kept personal and anonymous.

3.2.2. Sample and sampling

University students were chosen as the target of this study because they are the main users of social media, sensitive to social media marketing content, and have high green consumption potential and behavioural tendencies. Respondents were recruited online through the Wenjuanxing platform, and the sample source was not restricted to any region, which has a certain geographical diversity. This wide sample acquisition helps to enhance the external validity of the study results, and to a certain extent reflects the trend and characteristics of green consumption behaviour of China's young population, especially digital natives with high education background. Therefore, the results of this study have a certain degree of generalisability and are particularly applicable to understanding university students' green purchasing intentions in social media contexts.

The G*Power calculator is used to set the statistical power at 80 % and the significance threshold at 5 % [105]. Given the number of variables in this investigation, a minimum sample size of 68 is necessary. To account for anticipated dropouts, incomplete records, and other research-related challenges, this study increased the sample size by 10 % [106]. Furthermore, to ensure consistent statistics for each group, the target number of participants to be retained in each group is set at 75.

The study employs a convenience sampling method, recruiting participants through the mutual filling community of the Wenjuanxing platform. To ensure that the samples meet the study's requirements, two screening questions were designed to confirm that respondents are university students and users of Xiaohongshu. The screening process

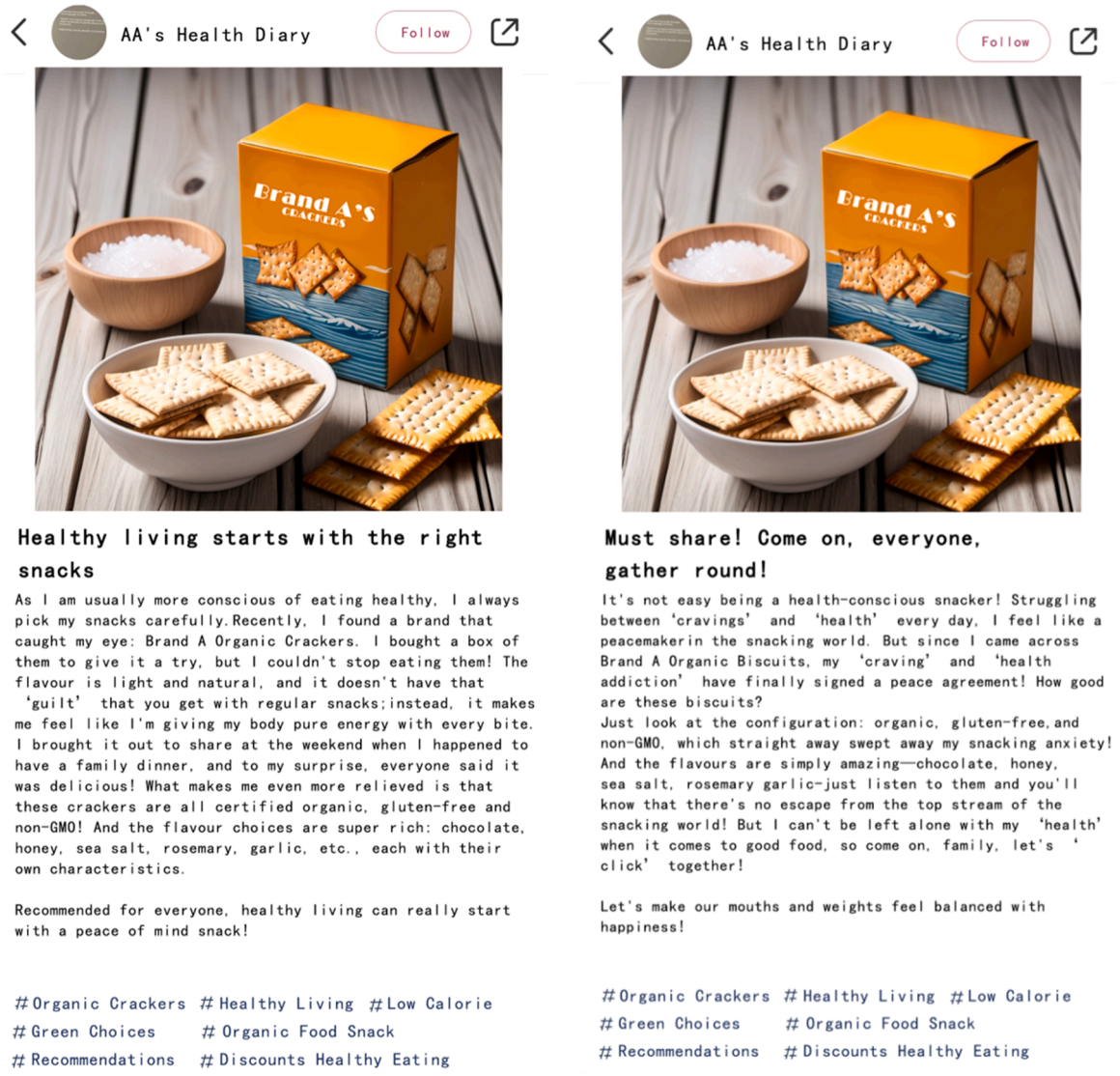

Fig. 1. (*continued*).

yielded a total of 444 eligible samples, 111 from each group.

The demographic details of the study's participants are as follows (Table 1): Males comprised 43.9 % of the participants, while females accounted for 56.1 %. Xiaohongshu has a higher proportion of female users, which aligns with the current trends [107]. The age range of all respondents was 18 to 26 years, with 55.4 % aged 21 to 23, and the remaining 44.6 % aged either 18 to 20 or 24 to 26. Additionally, 56.1 % of university students reported spending 4 to 6 h daily browsing social media. Among the primary social media platforms used by university students, TikTok and WeChat ranked first and second, with 77.5 % and 74.8 %, respectively, followed by Xiaohongshu in third place at 54.7 %. The main social media usage motives include Shopping (53.4 %), Product information (57.7 %), News (55 %), Entertainment (58.8 %), Find study materials (52 %), and Recreational time (51.4 %). The main social habits of university students include Comment (60.6 %), Like (58.8 %), Share (57.7 %), and Interactive (51.4 %). Among purchasing platforms, TikTok (77.9 %), Xiaohongshu (56.5 %), and WeChat (52 %) ranked as the top three. The leading reasons for purchasing on social media platforms were promotions (59.7 %), clear product description (58.6 %) and recommended by other consumers (51.4 %).

3.2.3. Measurement tool

This study includes a manipulation check item at the end of each page of content to ensure that the experimental manipulation was successful. For instance, the manipulation of content source and type was assessed by asking, what extent is this content presented in the form of user-generated storytelling?

To ensure measurement rigour, the other measures used well-established scales that were appropriately modified to meet the research objectives of this study. The items measuring UGC (four items), FGC (four items), L (three items), S (three items) and C (three items) were adapted from the study by Ibrahim et al. [54]. According to the test of scale reliability in the study, the Cronbach's alpha values of the above constructs exceeded 0.80 and the reliability was met. The convergent validity and discriminant validity of these scales were confirmed by confirmatory factor analysis. Meanwhile, the measures of content attitudes (four items) and GPI (five items) were adapted from the scale developed by Muda and Hamzah [108], which has been widely used in studies of digital advertising and environmentally conscious consumption. Their original study reported that the factor loading, composite reliability, and average variance extracted (AVE) for both constructs exceeded 0.7, and that reliability and validity were met. These scales are particularly relevant to this study as they were developed to examine marketing strategies on digital platforms and are therefore suitable for use in examining the impact of marketing strategies on consumer attitudes and intentions on social media platforms. A five-point Likert scale

Table 1
Demographic profile of participants.

Demographics	Characteristics	Frequency	Percentage
Age	18–20	91	20.5
	21–23	246	55.4
	24–26	107	24.1
Gender	male	195	43.9
	female	249	56.1
Time	1–3h	132	29.7
	4–6h	250	56.3
	>6h	62	14
Primary usage social media platform	Weibo	172	38.7
	WeChat	332	74.8
	TikTok	344	77.5
	Kwai	196	44.1
	QQ	152	34.2
	Tieba	97	21.8
	Tencent Video	126	28.4
	Zhihu	101	22.7
	RED	243	54.7
	BiliBili	127	28.6
SM usage motivations	Shopping	237	53.4
	Product information	256	57.7
	News	244	55
	Entertainment	261	58.8
	Find study materials	231	52
	Recreational time	228	51.4
	Interact with others	157	35.4
	Social with friends	140	31.5
	others	1	0.2
Usage habits	Like	261	58.8
	Comment	269	60.6
	Share	256	57.7
	Interactive	228	51.4
	Replies	191	43
	Exchange information	149	33.6
	Publish information	132	29.7
	Phone or video call	104	23.4
	Others	1	0.2
SM purchase platform	WeChat	231	52
	TikTok	346	77.9
	Kwai	196	44.1
	RED	251	56.5
	Others	16	3.6
SM food purchase reason	Comments	213	48
	Promotions	265	59.7
	Clear product description	260	58.6
	Recommended by other consumers	228	51.4
	Recommended by internet celebrities	188	42.3
	Recommended by celebrities	126	28.4
	Celebrity endorsement	65	14.6
	Others	2	0.5

is used for all scales (1 being strongly disagreed with and 5 being strongly agreed with).

3.2.4. Research procedure

Before the formal experiment begins, a pre-test will be conducted. The major goal of this pre-test is to determine whether the material stimuli are normal, and the measurement scales are useful. This study recruited 50 university students for each group, and participants were randomly assigned to receive treatment involving social media content. Independent sample *t*-test results indicated that the subjects could significantly distinguish between FGCS ($M = 6.1$, $M = 3.54$, $F = 24.81$, $p < 0.001$), UGCS ($M = 6.1$, $F = 24.81$, $p < 0.001$), FGCH ($M = 6.1$, $F = 24.81$, $p < 0.001$), and UGCH (M past = 6.1, $F = 24.81$, $p < 0.001$), indicating that participants can accurately comprehend the created social media content, demonstrating that the classification and description of the experimental materials are both accurate and effective. Furthermore, the findings of the reliability and validity analyses met the stated threshold standards, resulting in the retention of all questions during the data collection phase. Furthermore, a collinearity check was performed, and no collinearity issues were identified. The final questionnaire was distributed through the Questionnaire Star platform. Initially, the questionnaire included screening questions, allowing respondents to provide basic demographic information. Subsequently, participants viewed the material and completed manipulation check items, along with subsequent questions regarding content perception, ATT, L, S, C, and GPI.

3.2.5. Data analysis methods

First, the preliminary analysis encompasses data cleaning, descriptive statistics, manipulation checks, and assessments of reliability and validity. During the data cleaning stage, several processing measures were taken to ensure data quality. Firstly, samples with identical answers to all questionnaires were excluded. Second, samples with consistent answers in more than nine questions were excluded to rule out low commitment or inattentive responses. Finally, the sample with the lowest total score was further excluded until 111 valid samples were retained in each group in order to ensure a consistent sample size between experimental groups. The above steps aimed to remove invalid data for inattentive answering, thus enhancing the reliability of the study results. Manipulation checks employ independent samples *t*-tests to analyse and verify the effectiveness of the experimental material manipulation. Reliability and validity assessments examine measurement tool quality using measures like Cronbach's α coefficient and Average Variance Extracted (AVE).

Second, hypothesis testing employs a two-stage strategy. The first stage utilizes MANOVA analysis to examine the main effects and interaction effects of four groups of materials on the dependent variable. It further analyses the specific patterns of significant effects through post-hoc tests. The rationale for selecting MANOVA analysis is that this study involves multiple dependent variables that can be included in the statistical test simultaneously [109]. The second stage employs the PROCESS Model 4 to assess the mediating effect of attitude.

3.3. Results

3.3.1. Operation check

The Table 2 depicts the results of an independent sample *t*-test, indicate that participants in FGCS ($M = 4.09$, $p < 0.001$), FGCH ($M = 3.892$, $p < 0.001$), UGCS ($M = 3.982$, $p < 0.001$), and UGCH ($M = 3.739$, $p < 0.001$) can recognize various types of text forms and content. This suggests that the manipulation is effective.

3.3.2. MANOVA - multivariate significance test

The MANOVA multivariate significance test reveals statistically significant differences across groups in terms of dependent variable linear combinations. Wilks' Lambda is among the most reported statistics. With a significance level of 0.000—<0.05—the Wilks' Lambda value of 0.898 is considered significant. As a result, the groups can be distinguished from one another. In example, there is a significantly different outcome between individuals and firms when it comes to publishing humorous and narrative content.

The statistical measures of the corrected model demonstrate the overall impact of the independent variable (group) on the dependent

Table 2
One-sample test.

	t	Sig. (2-tailed)	Mean Difference	95 % Confidence Interval of the Difference	
				Lower	Upper
FGCS	70.498	.000	4.09	3.98	4.21
FGCH	49.757	.000	3.892	3.74	4.05
UGCS	64.901	.000	3.982	3.86	4.1
UGCH	40.236	.000	3.739	3.55	3.92

variable. As shown in Table 3, the F-value is significant ($p < 0.05$) for all dependent variables (L, S, C, GPI), indicating that the grouping variable significantly affects all dependent variables. Although the grouping variable has a notable impact on the four dependent variables (L, S, C, GPI), the explanatory power is relatively low, with R^2 values ranging from 3.9 % to 7 %. Among these, L exhibits the highest explanatory power ($R^2 = 7$ %), suggesting that the impact of grouping on L is the most pronounced.

The results of the Homogeneous Subsets (Table 5) show that UGCH's performance in terms of L, S, C, and GPI is much worse than that of other forms, which is in line with the findings in Table 4. This form may not be effective in enhancing all indicators. FGCS, FGCH, UGCS show similar effects on S, C, and GPI. This suggests that FGCH and UGCS possess comparable attractiveness or effectiveness in these three categories. However, in terms of L, the FGC has a greater impact than the UGC.

The Tukey HSD findings for multiple comparisons (Table 6) show that the mean of FGCS and UGCS differs significantly ($M = 0.312$, $p = 0.010$). FGCS may be more appealing to university students. Consequently, H1a (FGCS vs. UGCH) is rejected, indicating a substantial difference between the FGCS and UGCH formats, with a mean difference of 0.568 and $p = 0.001$. Compared to UGCH, FGCS has a substantially greater impact (mean difference: 0.324, $p = 0.007$). Furthermore, there is a considerable difference between the FGCH and UGCH forms, with the former having a bigger impact than the latter. This indicates that FGCH is more likely to elicit likes from university students. Therefore, H2a is supported. The p-values for other pairwise comparisons are greater than 0.05, indicating that the mean differences are not statistically significant.

The study on the behaviour of S and C found that FGCS and UGCS have the same utility for university students; therefore, hypotheses H1b and H1c are rejected. The content form of FGCS and FGCH is significantly improved compared to UGCH, ($M = 0.365$, $M = 0.350$, $p = 0.00$, $p = 0.002$). Thus, hypothesis H2b is supported. Furthermore, UGCS's sharing impact is significantly greater than UGCH's, as indicated by a mean difference of 0.270 ($p = 0.002$). The p-values for other group comparisons exceed 0.05, suggesting that the mean differences are not statistically significant.

The mean differences between FGCS, FGCH, and UGCH are 0.444 and 0.404, $p = 0.000$, indicating a significant difference in form between FGCH and UGCH. This suggests that humorous content released by brands is more likely to be shared among university students than humorous content released by users. Therefore, support for H2c is rejected. UGCS's sharing effect is much greater than UGCH's, as evidenced by the mean difference between the two groups of 0.350 and $p = 0.003$.

There is no significant difference between FGCS and UGCS in promoting green purchase intention; therefore, H3 is rejected. In contrast, FGCH significantly enhances green purchase intention compared to UGCH ($M = 0.392$, $p = 0.000$), leading to the rejection of H4. The mean difference between UGCS and UGCH is 0.248 ($p = 0.037$), indicating that the sharing effect of UGCS is significantly greater than that of UGCH. The p-values for other group comparisons exceed 0.05, suggesting that the mean differences are not statistically significant.

3.3.3. Mediation analysis

This study examines how social media content attitudes mediate the link between content perception, L, S, C, and GPI. According to Hayes [110], the ratio of indirect effect to total effect indicates the extent to which the mediator contributes to the outcome.

The results showed that among all pathways, no mediating effect of ATT was found only between the pathway FGCH and GPI (95 % CI [−0.0043, 0.1467], including 0). Therefore, only Hypothesis 9d is rejected. It suggests that the effect of FGCH on GPI is direct and not because of transformation through attitudes. In other words, consumers may find the brand funny or humorous, but this 'humorous liking' does not enhance their 'rational attitude' towards the brand. The mechanism by which humour motivates purchase may come from the following non-attitudinal path. Humour can be an effective strategy if the goal is to quickly increase purchase intent or stimulate conversion behaviour.

The results for the FGCS pathway to S ($b = 0.165$, $p = 0.1352$), the UGCS pathway to C ($b = 0.1341$, $p = 0.202$), and the UGCS pathway to GPI ($b = 0.1548$, $p = 0.0854$) all showed a non-significant direct effect ($p > 0.05$). In contrast, none of the above pathway confidence intervals included 0, therefore, the indirect effect between pathways was established. It indicates that ATT played a fully mediating role in the relationship between FGCS and S, UGCS and C, and UGCS and GPI. The indirect effects are 40.91 %, 54.57 %, and 52.49 %, respectively. The above results indicate that the content generated by companies through storytelling does not directly promote users' sharing behaviours by itself. Users may be willing to repost on social media only after they have developed a positive attitude. The proportion of indirect effect is 40.91 %, implying that although attitude is an important mediator, there is still about 59 % of the influence mechanism that has not yet been explained and may involve other factors that have not been explored. Attitude fully mediates the relationship between corporate storytelling content and sharing behaviour, but its explanatory power is moderately weak. The other two paths show that story sharing among users does not directly motivate others to C as well as motivate GPI. ATT is the critical path influencing both C and GPI. The indirect effect of ATT between UGCS and C and GPI is greater than 50 % for both paths, suggesting strong explanatory power. Explanation is an important psychological mechanism influencing C as well as GPI. Therefore, by encouraging users to create and share authentic experiences in order to indirectly enhance the ATT of other users, which in turn promotes C and GPI.

Except for these four groups, the results for all other groups indicate that the independent variables have a significant direct effect on the dependent variable. The indirect relationship between the independent and dependent variables is also important when mediators are present. Thus, ATT partially mediated the relationships between FGCS and L, C, GPI; FGCH and L, S, C; UGCS and L, S; UGCH and L, S, C, GPI. This pathway, where ATT acts as a mediator between FGCH and L, has the lowest percentage of indirect effect at 11.97 %, and among the remaining paths, the percentage of indirect effect of ATT ranges from

Table 3
Multivariate tests.

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.979	5212.847[b]	4.000	437.000	.000
	Wilks' Lambda	.021	5212.847[b]	4.000	437.000	.000
	Hotelling's Trace	47.715	5212.847[b]	4.000	437.000	.000
	Roy's Largest Root	47.715	5212.847[b]	4.000	437.000	.000
group	Pillai's Trace	.104	3.946	12.000	1317.000	.000
	Wilks' Lambda	.898	4.004	12.000	1156.485	.000
	Hotelling's Trace	.111	4.047	12.000	1307.000	.000
	Roy's Largest Root	.086	9.461[c]	4.000	439.000	.000

[a]. Design: Intercept + group.
[b] . Exact statistic.
[c] . The statistic is an upper bound on F that yields a lower bound on the significance level.

Table 4
Tests of between-subjects effects.

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	L	18.147[a]	3	6.049	11.028	.000
	S	13.780[b]	3	4.593	8.039	.000
	C	9.548[c]	3	3.183	5.986	.001
	GPI	10.637[d]	3	3.546	7.551	.000
Intercept	L	6971.292	1	6971.292	12,709.827	.000
	S	6722.595	1	6722.595	11,765.742	.000
	C	6845.070	1	6845.070	12,874.514	.000
	GPI	7084.014	1	7084.014	15,087.027	.000
group	L	18.147	3	6.049	11.028	.000
	S	13.780	3	4.593	8.039	.000
	C	9.548	3	3.183	5.986	.001
	GPI	10.637	3	3.546	7.551	.000
Error	L	241.338	440	.548		
	S	251.403	440	.571		
	C	233.937	440	.532		
	GPI	206.599	440	.470		
Total	L	7230.778	444			
	S	6987.778	444			
	C	7088.556	444			
	GPI	7301.250	444			
Corrected Total	L	259.485	443			
	S	265.183	443			
	C	243.485	443			
	GPI	217.236	443			

[a] . R Squared = 0.070 (Adjusted R Squared = 0.064).
[b] . R Squared = 0.052 (Adjusted R Squared = 0.046).
[c] . R Squared = 0.039 (Adjusted R Squared = 0.033).
[d] . R Squared = 0.049 (Adjusted R Squared = 0.042).

Table 5
Homogeneous subsets.

			Subset		
L	group	N	1	2	3
Tukey HSD[a,b]	UGCH	111	3.676		
	UGCS	111	3.931	3.931	
	FGCH	111		4	4
	FGCS	111			4.243
	Sig.		0.051	0.899	0.07

			Subset	
S	group	N	1	2
Tukey HSD[a,b]	UGCH	111	3.592	
	UGCS	111		3.941
	FGCH	111		3.995
	FGCS	111		4.036
	Sig.		1	0.788

			Subset	
C	group	N	1	2
Tukey HSD[a,b]	UGCH	111	3.68	
	UGCS	111		3.95
	FGCH	111		4.03
	FGCS	111		4.045
	Sig.		1	0.769

			Subset	
GPI	group	N	1	2
Tukey HSD[a,b]	UGCH	111	3.743	
	UGCS	111		3.991
	FGCS	111		4.108
	FGCH	111		4.135
	Sig.		1	0.399

[a] Uses Harmonic Mean Sample Size = 111.000.
[b] Alpha = 0.05.

18.16 % to 37.55 %, suggesting that it plays only a moderately strong and partially mediating role in explaining the effect of corporate content on green purchase intention. This suggests that consumers' purchase behaviour is not entirely dependent on their attitudinal perceptions of content or brands but is more likely to be driven by other factors. Therefore, in digital content marketing, the attitude construct, although important, should be considered in parallel with other motivational mechanisms to avoid using attitude as the only explanatory tool for behavioural paths. The complete mediation results are presented in Table 7.

3.4. Discussion

Study 1 reveals that, first, FGC has overall better communication effects than UGC. This study partially supports the results of Ibrahim et al. [54]. Whether it is storytelling or humour, FGC can achieve more L, S, C and GPI than UGC. This finding runs counter to that of Grosso et al. [111], who found that FGC is more likely than UGC to encourage interactive participation among university students in the social media marketing of green foods. Second, regarding content expression, storytelling proves to be more effective than simple humour. The study found that UGCS is significantly better than UGCH in promoting users' L, S, C, and other interactive behaviours. This implies that narrative storytelling is more effective in grabbing the interest of young audiences and promoting their engagement in interactive activities [112,113]. Third, existing research indicates that the role of FGC in social media has diminished, showing little effect on ATT and even a negative influence on GPI [20]. However, these findings have not been corroborated by this study. This study demonstrate that FGC (whether S or H) is significantly more effective than UGCH [45]. This shows that businesses should prioritise professional content production in their social media marketing plans to increase marketing effectiveness. Additionally, even UGC, UGCS is more likely to foster the development of GPI compared to UGCH.

In most situations, attitude serves a partial mediating role, according to this study's analysis of attitude's mediating function. This suggests that user ATT is usually influenced by social media marketing content, which in turn drives the behavioural behaviours of users. This finding supports the classic attitude-behaviour theory and extends its application within the social media context. However, the mediating role of

Table 6
Multiple comparisons.

Dependent Variable		(I) group	(J) group	Mean Difference (I-J)	Std. Error	Sig.	95 % Confidence Interval	
							Lower Bound	Upper Bound
L	Tukey HSD	FGCS	FGCH	.243	.0994	.070	−0.013	.500
			UGCS	.312*	.0994	.010	.056	.569
			UGCH	.568*	.0994	.000	.311	.824
		FGCH	FGCS	−0.243	.0994	.070	−0.500	.013
			UGCS	.069	.0994	.899	−0.187	.325
			UGCH	.324*	.0994	.007	.068	.581
		UGCS	FGCS	−0.312*	.0994	.010	−0.569	−0.056
			FGCH	−0.069	.0994	.899	−0.325	.187
			UGCH	.255	.0994	.051	−0.001	.512
		UGCH	FGCS	−0.568*	.0994	.000	−0.824	−0.311
			FGCH	−0.324*	.0994	.007	−0.581	−0.068
			UGCS	−0.255	.0994	.051	−0.512	.001
	Bonferroni	FGCS	FGCH	.243	.0994	.089	−0.020	.507
			UGCS	.312*	.0994	.011	.049	.576
			UGCH	.568*	.0994	.000	.304	.831
		FGCH	FGCS	−0.243	.0994	.089	−0.507	.020
			UGCS	.069	.0994	1.000	−0.194	.333
			UGCH	.324*	.0994	.007	.061	.588
		UGCS	FGCS	−0.312*	.0994	.011	−0.576	−0.049
			FGCH	−0.069	.0994	1.000	−0.333	.194
			UGCH	.255	.0994	.063	−0.008	.519
		UGCH	FGCS	−0.568*	.0994	.000	−0.831	−0.304
			FGCH	−0.324*	.0994	.007	−0.588	−0.061
			UGCS	−0.255	.0994	.063	−0.519	.008
S	Tukey HSD	FGCS	FGCH	.041	.1015	.978	−0.221	.302
			UGCS	.095	.1015	.788	−0.167	.356
			UGCH	.444*	.1015	.000	.183	.706
		FGCH	FGCS	−0.041	.1015	.978	−0.302	.221
			UGCS	.054	.1015	.951	−0.208	.316
			UGCH	.404*	.1015	.000	.142	.666
		UGCS	FGCS	−0.095	.1015	.788	−0.356	.167
			FGCH	−0.054	.1015	.951	−0.316	.208
			UGCH	.350*	.1015	.003	.088	.612
		UGCH	FGCS	−0.444*	.1015	.000	−0.706	−0.183
			FGCH	−0.404*	.1015	.000	−0.666	−0.142
			UGCS	−0.350*	.1015	.003	−0.612	−0.088
	Bonferroni	FGCS	FGCH	.041	.1015	1.000	−0.228	.309
			UGCS	.095	.1015	1.000	−0.174	.363
			UGCH	.444*	.1015	.000	.176	.713
		FGCH	FGCS	−0.041	.1015	1.000	−0.309	.228
			UGCS	.054	.1015	1.000	−0.215	.323
			UGCH	.404*	.1015	.000	.135	.673
		UGCS	FGCS	−0.095	.1015	1.000	−0.363	.174
			FGCH	−0.054	.1015	1.000	−0.323	.215
			UGCH	.350*	.1015	.004	.081	.619
		UGCH	FGCS	−0.444*	.1015	.000	−0.713	−0.176
			FGCH	−0.404*	.1015	.000	−0.673	−0.135
			UGCS	−0.350*	.1015	.004	−0.619	−0.081
C	Tukey HSD	FGCS	FGCH	.015	.0979	.999	−0.237	.267
			UGCS	.095	.0979	.769	−0.158	.347
			UGCH	.365*	.0979	.001	.112	.617
		FGCH	FGCS	−0.015	.0979	.999	−0.267	.237
			UGCS	.080	.0979	.848	−0.173	.332
			UGCH	.350*	.0979	.002	.097	.602
		UGCS	FGCS	−0.095	.0979	.769	−0.347	.158
			FGCH	−0.080	.0979	.848	−0.332	.173
			UGCH	.270*	.0979	.030	.018	.523
		UGCH	FGCS	−0.365*	.0979	.001	−0.617	−0.112
			FGCH	−0.350*	.0979	.002	−0.602	−0.097
			UGCS	−0.270*	.0979	.030	−0.523	−0.018
	Bonferroni	FGCS	FGCH	.015	.0979	1.000	−0.244	.274
			UGCS	.095	.0979	1.000	−0.165	.354
			UGCH	.365*	.0979	.001	.105	.624
		FGCH	FGCS	−0.015	.0979	1.000	−0.274	.244
			UGCS	.080	.0979	1.000	−0.180	.339
			UGCH	.350*	.0979	.002	.090	.609
		UGCS	FGCS	−0.095	.0979	1.000	−0.354	.165
			FGCH	−0.080	.0979	1.000	−0.339	.180
			UGCH	.270*	.0979	.036	.011	.530
		UGCH	FGCS	−0.365*	.0979	.001	−0.624	−0.105
			FGCH	−0.350*	.0979	.002	−0.609	−0.090
			UGCS	−0.270*	.0979	.036	−0.530	−0.011
GPI	Tukey HSD	FGCS	FGCH	−0.027	.0920	.991	−0.264	.210

(*continued on next page*)

Table 6 (*continued*)

Dependent Variable	(I) group	(J) group	Mean Difference (I-J)	Std. Error	Sig.	95 % Confidence Interval	
						Lower Bound	Upper Bound
		UGCS	.117	.0920	.580	−0.120	.354
		UGCH	.365*	.0920	.000	.128	.602
	FGCH	FGCS	.027	.0920	.991	−0.210	.264
		UGCS	.144	.0920	.399	−0.093	.381
		UGCH	.392*	.0920	.000	.155	.629
	UGCS	FGCS	−0.117	.0920	.580	−0.354	.120
		FGCH	−0.144	.0920	.399	−0.381	.093
		UGCH	.248*	.0920	.037	.011	.485
	UGCH	FGCS	−0.365*	.0920	.000	−0.602	−0.128
		FGCH	−0.392*	.0920	.000	−0.629	−0.155
		UGCS	−0.248*	.0920	.037	−0.485	−0.011
Bonferroni	FGCS	FGCH	−0.027	.0920	1.000	−0.271	.217
		UGCS	.117	.0920	1.000	−0.127	.361
		UGCH	.365*	.0920	.001	.121	.609
	FGCH	FGCS	.027	.0920	1.000	−0.217	.271
		UGCS	.144	.0920	.707	−0.100	.388
		UGCH	.392*	.0920	.000	.148	.636
	UGCS	FGCS	−0.117	.0920	1.000	−0.361	.127
		FGCH	−0.144	.0920	.707	−0.388	.100
		UGCH	.248*	.0920	.044	.004	.492
	UGCH	FGCS	−0.365*	.0920	.001	−0.609	−0.121
		FGCH	−0.392*	.0920	.000	−0.636	−0.148
		UGCS	−0.248*	.0920	.044	−0.492	−0.004

Based on observed means.
The error term is Mean Square (Error) = 0.470.
* The mean difference is significant at the 0.05 level.

Table 7
Mediation analysis summary.

Relationship	Total effect	Direct effect	Indirect effect	Total effect mediated %	Confidence interval		Conclusion
					Lower Bound	Upper Bound	
FGCS->ATT->*L*	.3257 (0.0002)	.2034 (0.0321)	.1223	37.55 %	0.0389	0.2273	Partial Mediation
FGCS->ATT->*S*	.2794 (0.0052)	0.165 (0.1352)	.1143	40.91 %	0.0022	0.2405	Full Mediation
FGCS->ATT->*C*	.4487 (0.0000)	.2841 (0.0102)	.1645	36.66 %	0.0659	0.2763	Partial Mediation
FGCS->ATT->GPI	.4166 (0.0000)	.2903 (0.0006)	.1262	30.29 %	0.0405	0.2143	Partial Mediation
FGCH->ATT->*L*	.5689 (0.0000)	.5009 (0.0000)	.0681	11.97 %	0.0103	0.1555	Partial Mediation
FGCH->ATT->*S*	.3246 (0.0030)	.2376 (0.0313)	.0870	26.80 %	0.0154	0.1887	Partial Mediation
FGCH->ATT->*C*	.3064 (0.0019)	.2154 (0.0278)	.0910	29.70 %	0.0253	0.1799	Partial Mediation
FGCH->ATT->GPI	.3158 (0.0015)	.2549 (0.0121)	.0609	19.28 %	−0.0043	0.1467	No Mediation
UGCS->ATT->*L*	.5248 (0.0000)	.4294 (0.0001)	.0953	18.16 %	0.0196	0.2034	Partial Mediation
UGCS->ATT->*S*	.4449 (0.0001)	.3215 (0.0068)	.1234	27.74 %	0.0257	0.248	Partial Mediation
UGCS->ATT->*C*	.2952 (0.0081)	.1341 (0.2202)	.1611	54.57 %	0.0550	0.2901	Full Mediation
UGCS->ATT->GPI	.3258 (0.0008)	.1548 (0.0854)	.171	52.49 %	0.0753	0.289	Full Mediation
UGCH->ATT->*L*	.7588 (0.0000)	.5332 (0.0000)	.2256	29.73 %	0.0804	0.4313	Partial Mediation
UGCH->ATT->*S*	.7135 (0.0000)	.4660 (0.0000)	.2474	34.67 %	0.1035	0.4007	Partial Mediation
UGCH->ATT->*C*	.7476 (0.0000)	.6088 (0.0000)	.1388	18.57 %	0.0124	0.3299	Partial Mediation
UGCH->ATT->GPI	.6856 (0.0000)	.4657 (0.0000)	.2199	32.07 %	0.0600	0.3481	Partial Mediation

ATT varies across different content formats, particularly in the following combinations: FGCS and L, C, GPI; FGCH and L, S, C; UGCS and L, S; and UGCH and all behavioural responses, where attitude demonstrates a significant partial mediating effect. These findings corroborate earlier studies [38,85,121] that UGC and FGC indirectly influence user behaviour by altering their attitudes.

Second, the study indicates that attitude works as a complete mediator in some specific scenarios. Specifically, in the cases of FGCS and S, UGCS and C, and GPI, attitude demonstrates a complete mediating effect. This indicates that FGCS for S, UGCS for C, and GPI must

first influence users at both cognitive and emotional levels before ultimately leading to specific behavioural responses. A previous study by Wijaya et al. [38] confirms that UGC has a complete mediating effect on access intention, as influenced by attitude. This research provides a fresh viewpoint for comprehending the workings of content marketing and emphasises the crucial function that user attitude plays in social media marketing. Particularly, the study did not identify a significant mediating effect of FGCH on GPI. While FGCH does impact GPI, this unique finding suggests that ATT is not an effective mediator for this type of content, indicating the potential presence of other mediating factors.

4. Study 2

This study expands upon Study 1 by incorporating various promotional types to explore the underlying mechanisms through which different content types released by brands, in conjunction with diverse promotional methods, collectively influence purchase intentions. Additionally, it investigates which promotional method is most suitable for university students and examines the mediating role of content fluency.

4.1. Literature review

4.1.1. Rational demand (HP vs BF) and FGC

Promotional offers are a common and effective form of stimulation in content marketing, often in the form of discounts, free gifts and special events [114]. Promotions not only increase purchase intent through direct financial incentives, but also often embed entertainment elements, such as storytelling and emotional stimulation strategies that can increase content appeal and thus promote user engagement [115,116]. In addition, for hedonic products, promotions can also reduce purchase resistance by alleviating negative emotions, such as guilt, during the purchase process [117]. Existing studies have found that promotional strategies with entertainment significantly enhance users' purchase decisions [118]. In some cases, however, the appeal of the promotion may overwhelm the presentation of the content itself, making consumers desensitised to the way the content is presented. Research has shown that when promotional messages such as 'discounts' have a clear economic value and a high degree of credibility, consumer scepticism towards the message is significantly reduced [119]. Once the verifiability of the message is established, consumers may be less sensitive to the form of the content, leading to insignificant differences in the effectiveness of the two types of emotional content, storytelling and humour, in the promotional context [120].

Therefore, the following hypothesis are made:

H5. Under HP, there is no discernible difference between a) FGCS and b) FGCH content regarding university students' GPI.

H6. Under BF, there is no discernible difference between a) FGCS and b) FGCH content regarding university students' GPI.

4.1.2. The mediating role of conceptual fluency

This study attempts to explain the effect of cross-cues of different content and promotional messages released by companies on green purchase intentions through the potential mechanism of conceptual fluency. It has been found that CF plays a key role in information processing and that the perception of CF influences subsequent behavioural decisions [121]. When individuals perceive fluency and ease of understanding when processing information, they tend to be more inclined to accept the information and produce more positive emotional and behavioural responses [122]. Therefore, conceptual fluency is an important judgement indicator in assessing content [123].

The presentation of information significantly affects its conceptual fluency; Bullock et al. [124] noted that narrative-based content is perceived as more fluent because it is more episodic, clearly structured, and easier to process and understand. In contrast, non-narrative messages may be difficult to process due to a lack of coherent structure, thus reducing their persuasive effect. In addition, rich but logical content enhances the sense of fluency, which in turn enhances purchase intention [125]. Sokolova et al. [126] further found that the use of simple, clear pictures rather than complex images in advertisements significantly enhances consumers' CF perceptions and facilitates purchase intention.

Different types of promotions may all influence consumer behaviour by eliciting conceptual fluency. For example, Zou et al. [11] showed that both discount promotions and donation promotions can enhance consumers' conceptual fluency during the purchase process and have a more positive impact on purchase intention. Donation promotion has a more obvious effect due to its matching with consumers' altruism. This suggests that regardless of the promotional approach, the fit between the promotional strategy and the brand communication content may affect the consumers' processing fluency, which in turn affects the purchase decision process.

H12. Under the BF condition, CF serves as a mediator between FGCS and GPI.

H13. Under HP conditions, CF serves as a mediator between FGCS and GPI.

H14. Under BF conditions, CF serves as a mediator between FGCH and GPI.

H15. Under HP conditions, CF serves as a mediator between FGCH and GPI.

4.2. Methodology

4.2.1. Research design

This study utilizes an intergroup control design consisting of 2 (FGC type: S vs. H) × 2 (promotional type: HP vs.BF), while still employing the content from Study 1. Additionally, promotional offers such as BF and HP. The study materials are shown in Fig. 2. One of the two categories of FGCS and FGCH content was assigned to each participant at random.

4.2.2. Sample and sampling

Questionnaires were distributed through the mutual filling community of Wenjuanxing. A total of 209 questionnaires were collected. Non-university students, non-Xiaohongshu participants, and participants with attention issues were excluded, resulting in a final sample size of 154. Below are the statistical characteristics of the respondents, as presented in Table 8:

48.7 % of participants were between the ages of 21 and 23, while all responders range in age from 18 to 26. The proportions of respondents aged 18 to 20 and 24 to 26 are 22.7 % and 28.6 %, respectively. Males account for 43.5 % of the total participants, while females make up 56.5 %. In terms of purchasing platforms, TikTok holds the highest share at 72.1 %, followed by Kwai at 50 % and Xiaohongshu at 45.5 %, ranking as the second and third platforms, respectively. Regarding the reasons for purchasing on social media platforms, promotions ranked first at 57.8 %, followed by clear product descriptions at 55.8 % and recommendations from other consumers at 46.1 %.

4.2.3. Measurement tool

This study included a manipulation check item after each page of material to assess the effectiveness of the experimental manipulation. For instance, the manipulation of content source and type was evaluated by asking, "To what extent is this content a storytelling form generated by the brand?" Additionally, the measurement of conceptual fluency utilized an item from Zou et al. [11] that asked, "Do you think the seller's promotion is suitable for the product?" The intention to make a green purchase was assessed using five measurement items developed by

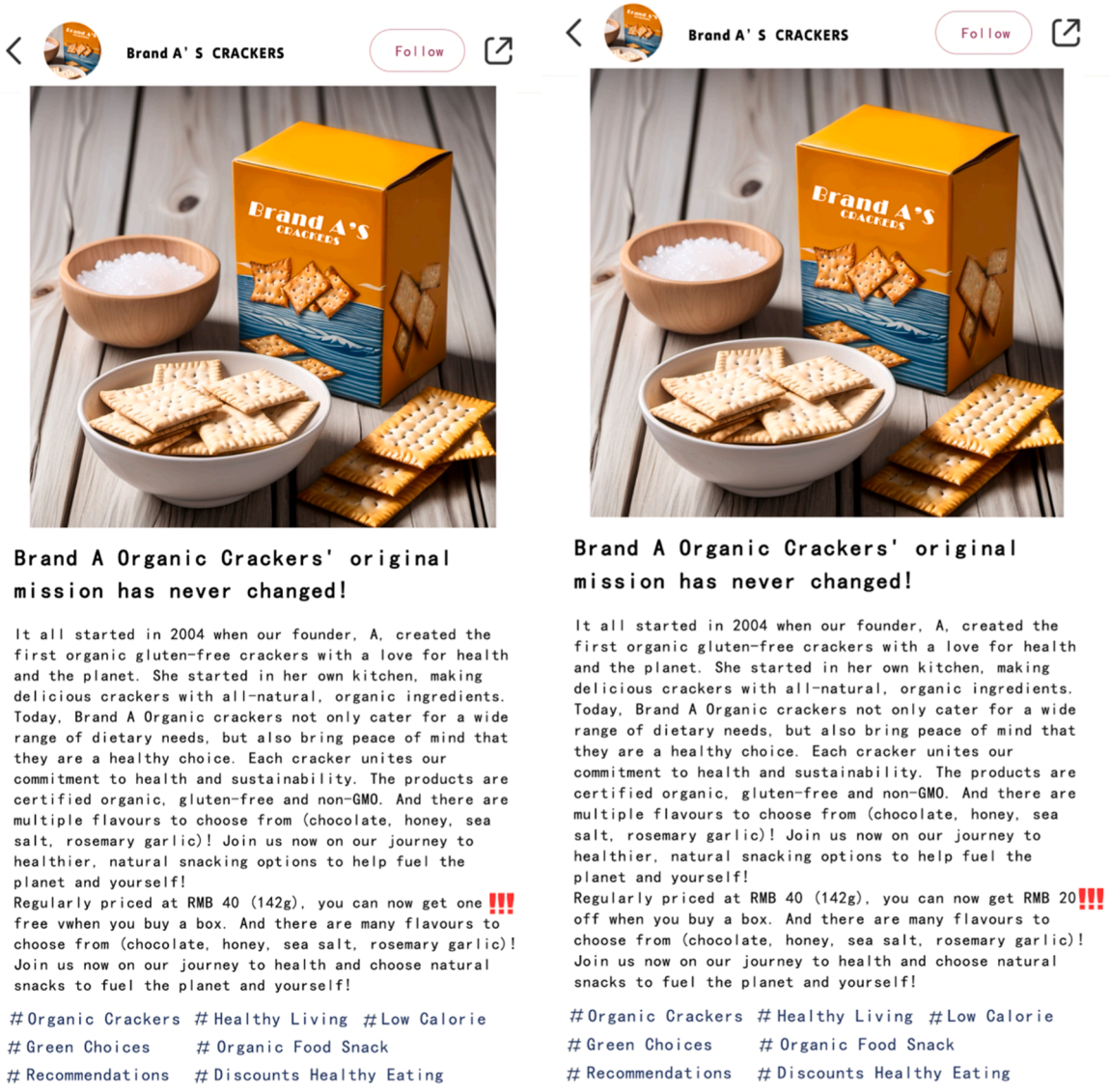

Fig. 2. Interaction effects of FGC type and promotion type.

Muda and Hamzah [108]. Each scale was measured using a five-point Likert scale (1 indicating strong disagreement and 5 indicating strong agreement).

4.2.4. Research procedure

Initially, participants submitted demographic data, such as age, gender, social networking sites they used to shop on, and the reasons for their purchases. Next, participants were divided into groups at random and asked to browse either FGCS or FGCH given in two promotional formats: BF or HP offer. They then answered questions regarding the manipulation, conceptual fluency, and their purchase intentions.

4.2.5. Data analysis methods

The preliminary analysis involves data cleaning, descriptive statistics, manipulation checks, and assessments of reliability and validity. The findings show that the validity and reliability requirements have been satisfied. There are two steps in the hypothesis testing process. In the first stage, ANOVA is used to examine the effects of four groups of materials on the dependent variable, followed by post-hoc tests to further analyse the specific patterns of significant effects. The second stage utilizes the PROCESS Model 4 method to assess the mediating effect of conceptual fluency.

4.3. Results

4.3.1. Operational check

Independent sample *t*-test, as illustrated in the Table 9, indicate that participants in FGCS ($M = 4.09$, $p < 0.001$), FGCH ($M = 3.892$, $p < 0.001$), UGCS ($M = 3.982$, $p < 0.001$), and UGCH ($M = 3.739$, $p < 0.001$) can recognize various types of text forms and content. This suggests that the manipulation is effective.

4.3.2. ANOVA significance test

The statistical metrics of the adjusted model, as presented in Table 10, indicate that there is no significant influence of the grouping variable on the dependent variables ($P = 0.775$).

From the results of the Homogeneous Subsets (Table 11), regarding purchase intention, there are no appreciable differences across the groups. This suggests that there are not any notable differences between the groups' promotional strategies. Therefore, hypotheses H5 and H6 are supported.

Fig. 2. (*continued*).

Table 8
Demographic profile of participants.

Demographics	Characteristics	Frequency	Percentage
Age	18–20	35	22.7
	21–23	75	48.7
	24–26	44	28.6
Gender	male	67	43.5
	female	87	56.5
SM purchase platform	WeChat	67	43.5
	TikTok	111	72.1
	Kwai	77	50.0
	RED	70	45.5
	Others	3	1.9
SM food purchase reason	Comments	61	39.6
	Promotions	89	57.8
	Clear product description	86	55.8
	Recommended by other consumers	71	46.1
	Recommended by internet celebrities	57	37.0
	Recommended by celebrities	34	22.1
	Celebrity endorsement	14	9.1

Table 9
One-sample test.

	t	Sig. (2-tailed)	Mean Difference	95 % Confidence Interval of the Difference	
				Lower	Upper
FGCS	53.785	.000	3.974	3.83	4.12
FGCH	45.865	.000	3.883	3.71	4.05
UGCS	40.719	.000	3.818	3.63	4
UGCH	37.867	.000	3.909	3.7	4.11

4.3.3. Mediation analysis

To explore the mediating role of CF between FGC and GPI, this study used PROCESS model 4 to conduct mediation effect analysis. As shown in Table 12, the results of the analysis reveal the mechanism by which different content types of influence consumers' GPI through CF. The findings showed that FGCS had a significant total effect on GPI ($\beta_{CF(BF)} = 0.3705$, $p < 0.01$; $\beta_{CF(HP)} = 0.2868$, $p < 0.01$). When examining the mediation path, it was found that the indirect effect of FGCS affecting GPI through CF(BF) was 0.0217, which accounted for 5.86 % of the total effect, but its 95 % confidence interval of [−0.0025, 0.0603] contained zero, which indicated that this mediation path was not significant, and

Table 10
Tests of between-subjects effects.

Dependent Variable: GPIA					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	.340[a]	3	0.113	0.37	0.775
Intercept	4580.743	1	4580.743	14,941.979	<0.001
GROUP	0.34	3	0.113	0.37	0.775
Error	93.197	304	0.307		
Total	4674.28	308			
Corrected Total	93.537	307			

[a] R Squared = 0.004 (Adjusted R Squared = −0.006).

Table 11
Homogeneous subsets.

GPI	GROUP	N	Subset
			1
Tukey HSD[a,b]	11	77	3.818
	21	77	3.834
	12	77	3.87
	22	77	3.904
	Sig.		0.772

Means for groups in homogeneous subsets are displayed.
Based on observed means.
The error term is Mean Square (Error) = 0.307.
[a] Uses Harmonic Mean Sample Size = 77.000.
[b] Alpha = 0.05.

therefore, there was no mediating role of CF(BF) between FGCS and GPI. Therefore, hypothesis H12 is rejected. The indirect effect of FGCS affecting GPI through CF(HP) is 0.1059, and its 95 % confidence interval of [0.0376, 0.1793] does not contain zero, indicating that this mediation path is significant. The indirect effect accounted for 36.92 % of the total effect, indicating a moderate mediating effect, and the direct effect of FGCS on GPI remained significant ($\beta = 0.1809$, $p = 0.0177$), thus CF(HP) partially mediated between FGCS and GPI. Therefore, H13 is supported.

For FGCH, the analyses showed the same significant total effect on GPI in either case ($\beta_{CF(BF)} = 0.1569$, $p < 0.05$; $\beta_{CF(HP)} = 0.2746$, $p < 0.01$).The indirect effect of FGCH affecting GPI through CF(BF) was 0.0041, which accounted for only 2.61 % of the total effect, and the 95 % confidence interval of [−0.0158, 0.0326] contains zero, indicating that CF(BF) does not significantly mediate between FGCH and GPI. Therefore, hypothesis H14 is rejected. The indirect effect of FGCH affecting GPI through CF(HP) is 0.0701, accounting for 25.53 % of the total effect, and its 95 % confidence interval of [0.0114, 0.1416] does not contain zero, indicating that this mediation path is significant. Meanwhile, the direct effect of FGCH on GPI remained significant ($\beta = 0.2045$, $p < 0.01$), thus CF(HP) partially mediated between FGCH and GPI. Therefore, H15 was supported.

The above findings indicate that CF (HP) significantly mediates the relationship between FGC and GPI, while the mediating role of CF is not significant under BF promotion. This result indicates that there is a significant difference in the role of different promotional formats in green marketing communication. Second, the indirect effect of FGCS through HP promotion (36.92 %) is significantly higher than that of FGCH through HP promotion (25.53 %). This suggests that the combination of story content and HP promotion has a stronger synergistic effect in promoting GPI.

4.4. Discussion

Study 2 explored the relationship between different content formats (FGCS / FGCH), promotional models (BF/HP), and GPI, and examined the mediating role of conceptual fluency. The findings revealed several important theoretical insights:

First, the study discovered no discernible variation in the direct promotion of purchase intention among several promotional models. This finding seems to differ from the direct impact of promotion on purchase decisions in traditional marketing theory. A possible explanation is that in the social media environment, the process of consumer purchase decision-making has become more complex, and simple promotional stimuli may not directly convert into purchase intention [127].

Secondly, the study discovered a significant direct relationship between FGC and GPI, regardless of the promotional model and content. When FGCS and FGCH are combined with their respective promotional strategies, their impact on GPI remains significant. This indicates a complementary rather than a substitutive relationship between content marketing and promotional strategies [128].

The mediating variable CF reveals the interaction mechanism between different promotional modes and content forms. Specifically, under the BF promotional mode, CF did not serve as a significant mediator between content form and GPI. In contrast, under the HP promotional mode, CF played a significant partial mediating role between FGCS, FGCH, and GPI. This suggests that half-price promotions may be more effective in promoting green consumption intentions due to their conceptual simplicity and clarity, ease of understanding and calculation, and the higher conceptual fluency that consumers perceive when processing green product information. In contrast, while buy-one-get-one-free promotions may be comparable in terms of actual value, their relative conceptual complexity may have increased consumers' cognitive burden and thus failed to effectively promote green consumption intentions. The research results of Gong et al. [129] also confirm that consumers perceive an increase in risk and difficulty, along with a decrease in decision confidence, when faced with gift promotions. Consequently, discount promotions are more favoured.

This study provides useful insights into corporate social media marketing strategies based on the results. First, companies should incorporate more storytelling narratives in content creation, for example, through episodic and situational expressions. Humour elements can enrich the content, but communication strategies that rely solely on humour may not achieve the desired marketing effect. Second, in green product promotions, companies should prioritize half-price promotions over buy-one-get-one-free. When faced with unknown or

Table 12
Mediation analysis summary.

Relationship	Total effect	Direct effect	Indirect effect	Total effect mediated %	Confidence interval		Conclusion
					Lower Bound	Upper Bound	
FGCS->CF(BF)->GPI	.3705 (0.0004)	.3488 (0.0007)	.0217	5.86 %	−0.0025	.0603	No Mediation
FGCS->CF(HP)->GPI	.2868 (0.0004)	.1809 (0.0177)	.1059	36.92 %	.0376	.1793	Partial Mediation
FGCH->CF(BF)->GPI	.1569 (0.0403)	.1528 (0.0471)	.0041	2.61 %	−0.0158	.0326	No Mediation
FGCH->CF(HP)->GPI	.2746 (0.0000)	.2045 (0.0002)	.0701	25.53 %	.0114	.1416	Partial Mediation

unfamiliar products (e.g., organic food that has not yet been tried and tested), consumers are more inclined to opt for low-loss-cost ways of trying them. In contrast, half-price promotions allow consumers to pay only one cost, and even if the product does not meet expectations, their financial loss is smaller. On the other hand, although 'buy one get one free' offers more goods on the surface, if the product itself does not meet the taste or expectation, consumers have to bear double the waste, which leads to higher psychological burden and waste anxiety. Therefore, in situations where consumers have less knowledge about the product, half-price strategies may be more likely to stimulate willingness to try than buy-one-get-one-free. Furthermore, companies should focus on the combination of storytelling content and half-price promotions when disseminating green marketing messages. Telling stories related to green products (e.g., the environmental characteristics of the product, the environmental efforts in the production process, the positive impact of using the product on the environment, etc.), together with half-price promotional messages, can maximise consumers' green consumption intentions. The storytelling content provides a meaningful framework for the half-price promotion, making the promotion more than just a price offer, but also a way for consumers to engage in environmental actions. Given that the conceptual fluency of half-price promotions only partially mediated the relationship between content features and green consumption intentions (the highest percentage was 36.92 %), companies should adopt diversified marketing communication strategies. In addition to focusing on the form and type of content of promotions, other factors that may influence consumers' green consumption decisions, such as social acceptance, environmental certification, and convenience, should also be considered to build an all-encompassing green marketing communication system.

5. Conclusion

This study examines the mechanisms by which the subject of publication, the form of content, and the promotional methods in social media marketing influence user interaction behaviour and green purchase intention. The findings indicate that FGC—whether in the form of storytelling or humour—outperforms UGC in promoting L, S, C and GPI. Notably, FGCS is particularly effective in driving interactive behaviours such as L, S, C and GPI. This suggests that companies should prioritize professional content creation in their social media marketing efforts, especially by utilizing storytelling narratives to enhance communication effects.

The study discovered that ATT is an important mediator between user behavioural responses and social media marketing content. Specifically, ATT fully mediated the relationship between FGCS and S, UGCS and C, as well as GPI. It also partially mediated the relationship between most other content forms and user interaction behaviour. However, no significant mediating effect was observed between FGCH and GPI. This indicates that social media marketing content primarily influences users' behavioural responses by shaping their attitudes, which are essential for fostering deeper user interactions.

Additionally, with respect to promotional tactics, the study found no discernible variation in the direct impacts of different promotional modes (such BF or HP) on purchase intention. However, through the mediating effect of CF, half-price promotions can significantly enhance the impact of FGCS and FGCH content on GPI. This finding highlights the important cognitive synergy between promotional methods and content forms and provides new insights into firms' integrated marketing communication strategies. Specifically, from the perspective of marketing practice, firms should be more inclined to use 'half-price' promotions when promoting green or organic products, especially for products that have not yet established widespread awareness or acceptance.

Limitations and future research

First, there are limitations in sample selection. The sample of this study is mainly from the university student group, and despite the unlimited geographic coverage, the age, education level and media exposure preferences of this group are relatively concentrated, which may affect the external validity of the results of the study. University students have specific preferences in the use of social media platforms, such as a preference for platforms with prominent visualisation such as Xiaohongshu, whose content algorithms, information presentation and user behaviour patterns differ significantly from those of, for example, moments of WeChat. Therefore, the differences in the motivations and behaviours of users on different platforms may affect their acceptance of and reaction to corporate or user-generated content, which in turn affects the generalizability of the study results. Second, the use of electronic questionnaires for data collection may be subject to self-reporting bias. Although the questionnaire released through Enjoining has the advantages of wide dissemination and easy completion, due to the lack of actual simulation of social media browsing, respondents may answer the questionnaire based on subjective judgement rather than real experience, thus affecting the ecological validity of the study. Longitudinal tracking design or field experiments can be used to improve the ecological validity of the results. Third, the research dimension of content types needs to be expanded. This study only compares the effects of storytelling and humour, and future research could explore the specific components of storytelling, such as how different plot development modes, narrative perspectives, character shaping, and the intensity of emotional appeals affect users' interactive behaviours and cognitive processing. Fourth, this study found that the mediating effects of attitude and conceptual fluency showed a moderate degree, which suggests that there is still a significant proportion of influence pathways that have not yet been revealed. Future research can explore potential mediating variables from multiple dimensions and examine the role of psychological factors such as consumers' environmental values, social identity, and self-expression needs in order to construct a more complete theoretical model. Finally, the experimental design of this study is limited to the combination of two content sources (user-generated and enterprise-generated) and two promotional formats (half-price and buy-one-get-one-free), which fails to comprehensively cover the diversity of marketing strategies that exist in market practice. In the future, the study can be extended to a wider range of promotional tactics (e.g., time-limited offers, member exclusives, points redemption, etc.), content forms (e.g., videos, live streaming, interactive games, etc.), as well as a comparison of differences in communication channels, so as to build a more systematic and comprehensive theoretical framework for green marketing in social media, and to provide a richer and more in-depth guidance for both academic research and corporate practice.

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Data availability statement

The data that support the findings of this study are available from the corresponding author, Tengwen Qing, up on reasonable request.

CRediT authorship contribution statement

Jinchi Cai: Writing – original draft, Software, Methodology, Conceptualization. **Syuhaily Osman:** Writing – review & editing. **Sharifah Azizah Haron:** Writing – review & editing. **Wenqing Teng:** Data curation, Project administration.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.sftr.2025.101001.

Data availability

Data will be made available on request.

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