Research on Influencing Factors of User Perceived Value of Mobile Fitness APP

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ABSTRACT: *This study takes fitness APP users' perceived health improvement results as the research object, and conducts an in-depth and systematic study on the influence mechanism between users with different exercise motivations and fitness APP technology function set. In theory, the research results provide a new perspective of availability theory to study the influence and matching mechanism of users' exercise motivation and fitness technology function. In practice, through in-depth understanding fitness technical feature sets and the relationship between user training motivation for users to use the results, the influence of this study to fitness APP development and enterprise operation management and Suggestions put forward the corresponding discussion, make enterprise can insight into consumer exercise motivation demand for fitness technology set differences, as well as better understanding what fitness exercise motivation and technical feature matching can be optimized and the user's health as a result, to enterprises for targeted products and strategic planning operations, which in turn promotes fitness APP the long-term development of the enterprise.*
KEY WORD: *Fitness APP, Exercise motivation, Perceived value, Qualitative Comparative Analysis*

I. INTRODUCTION

With the continuous development of China's economic level, People's awareness of health management is gradually awakening, the demand for fitness is also growing. According to the national fitness program (2016-2020) promulgated by the relevant institutions, 700 million people will take part in physical exercises at least once a week by 2020. According to the statistics of Aurora Big Data, in 2018, China Mobile Fitness APP had more than 100 million users, and showed a high growth rate of development[1]. The outbreak of the new crown disease in early 2020 has made health a national concern. Travel restrictions, epidemic prevention and control, "Home Fitness" is becoming the mainstream, all kinds of internet fitness APP platform to take a variety of forms to attract users. Different from traditional offline fitness, mobile fitness application not only provides users with exercise control functions such as fitness guidance, but also provides users with online fitness community and data management and analysis functions. Users tend to have different motivation to exercise where they use the fitness APP, and the different features of the fitness APP will appeal to different types of exercisers[2]. Therefore, how to provide the matching fitness function according to the user's exercise motivation and improve the user's experience and health benefits is the key issue for the development of fitness APP companies[3].

One of the main goals of mobile fitness apps is to attract users to continue using them and guide them to develop healthy behaviors and habits so as to improve their health. By collecting and integrating users' exercise data and body data, setting personalized fitness plans and exercise suggestions, and providing a wealth of sports social platforms and activities, fitness apps can help users better complete fitness activities by utilizing fragmented time[4]. However, many fitness APP seize the market by actively developing new functions and sub-products. Users' needs are unclear, and the platform blindly pursues personalization and socialization[5], which may neglect the construction of basic functions, and miscellaneous functions will reduce the platform's use efficiency and fail to meet users' needs[6]. We have limited knowledge about what kind of exercise motivation drives the selection of fitness APP functions, and how motivation matches fitness APP functions to promote health outcomes[7]. Although some scholars have empirically analysed the influence of users' exercise motivation and fitness APP functions on their exercise perceived value, but the current research has not explored the influence of the combination of these influencing factors on the user's use results. In order to solve this problem, this study investigates how users' exercise motivation affects the selection of fitness APP functional feature set, and how the matching degree between users' exercise motivation and fitness APP functional feature set selection affects users' final perceived value[2,8].

Based on the theory of task feature matching and the idea of comparative qualitative analysis, the purpose of this study is to explore the relationship among user's exercise motivation, fitness APP functional

feature set and user use outcome, try to answer the following questions: (1) what are the main features of the exercise motivation and fitness APP that affect the perceived value of users? (2) what combination of exercise motivation and functional characteristics will produce high perceived value for users? From the perspective of configuration effect, this paper uses qualitative comparative analysis (QCA) to deepen the understanding of the combination of user motivation factors and fitness APP features. In the enterprise practice, the conclusion of this study can provide some reference for the Mobile Fitness App Enterprise to formulate the related product development strategy and improve the user retention rate. One of the innovations of this study is the use of configuration analysis in methodology, which enhances the causal inference of the theory.

II. LITERATURE REVIEW

In this study, 153 articles about "Fitness APP" were retrieved from CSSCI (Chinese Social Sciences Citation Index) and master's doctoral dissertation. Then, SCIE (Science Citation Index Expanded, SCI-E) and SSCI (Social Science Citation Index) journals in the Web of Science core database were searched by "Fitness APP", and a total of 217 articles were retrieved. According to the research of mobile fitness APP in Chinese and English core database, the research trend of fitness APP has been increasing obviously in the past five years, which is attracting the attention of scholars.

Figure 1: Fitness APP Published and Included in CNKI and Web of Science
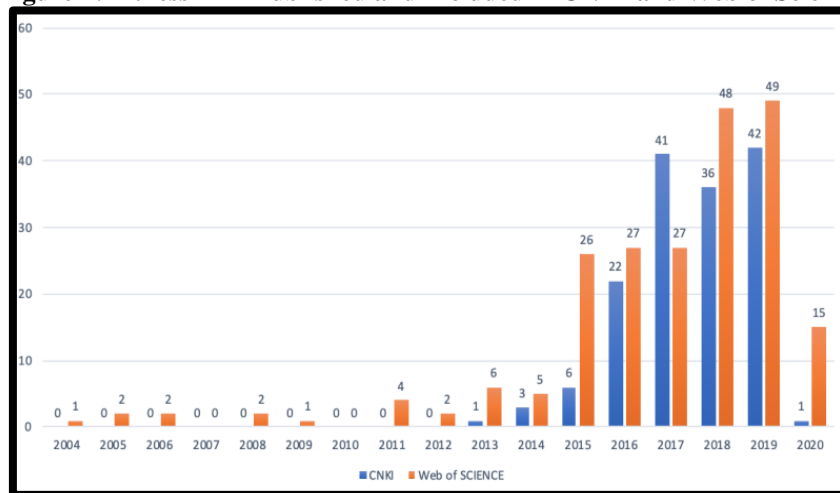
Through the keyword co-occurrence analysis, we find that the research content of fitness APP in China is mainly from the perspective of media communication to explore the status quo, communication, user impact. From the perspective of quantification and technology, foreign researches on sports apps mainly use mathematical modelling to study the relationship between users and some technical characteristics of sports apps.

Figure 2: Keyword co-occurrence knowledge graph of fitness APP literature in Web of Science
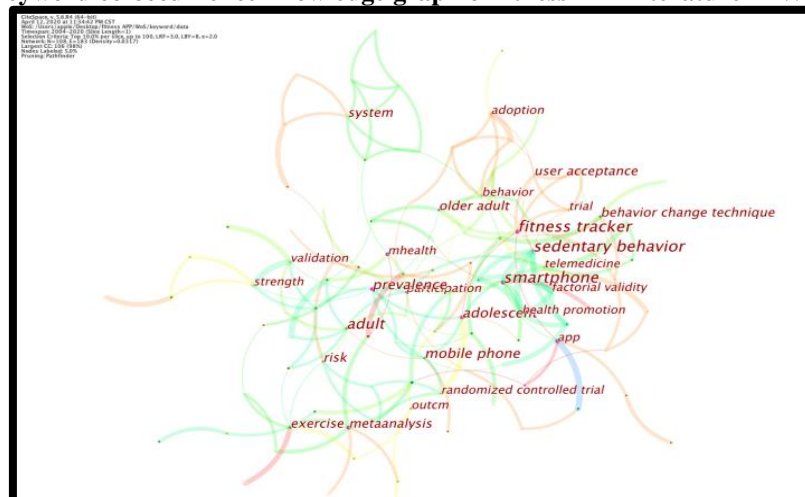
2.1 Perceived Value of Fitness APP Users

Perceived value is a subjective evaluation made by users after using a product or service, which has been widely used in the field of consumer behavior and information system adoption[8-9]. According to different research background and research object, scholars divide perceived value into many dimensions. Van der Heijden [10] first applies the philosophical concepts of hedonism and utilitarianism to the field of information systems, where hedonism is aimed at satisfying the psychological demands of Self-fulfilling values, utility, on the other hand, provides the user with Instrumental Value[11-12]. Fitness APP is a typical tool product that helps users achieve exercise goals such as healthy behavior change or maintenance and body improvement to provide instrumental value. With the deep integration of fitness apps and wearable devices and the transition to socializing and entertaining, fitness apps offer many pleasant user experiences for users, revealing some of the hedonistic features of information systems. The use scenario for fitness APP users is not limited to formal use by users in order to achieve fitness goals, users will also be encouraged to use the fitness APP by browsing through the community's discussion of topics, following users' movements, and recently launched fitness events, this kind of use also promotes experiential value to a certain extent for the user.

In the area of mobile health, there is an important perceived value for users to improve their health literacy through apps, record their health data, and share satisfaction with their health behaviors[13]. A good information system design should not only improve the results of instrumental tasks, but also provide users with a pleasant experience and increased sense of participation[14]. In platform products such as fitness APP, users' perceived value mainly includes instrumental value and experiential value. The determination of instrumental value is quite direct, and it directly depends on the objective of the current information system[15]. The instrumental value of a product is often assessed from a utilitarianism point of view, this paper tries to find out the actual perceived benefits of using fitness APP by asking questions such as "Improvement of health behavior", "Enhancement of intention of continuous exercise" and "Improvement of subjective vitality". Experiential value is usually measured in terms of hedonism, which reflects a positive and fulfilling state of mind in the use of information systems, such as deep engagement, focus, and contribution[16]. Agarwal et al. based on the Flow Theory, further developed cognitive absorption to describe a person's sense of total immersion in an interaction with an information system[17]. Therefore, this paper uses Cognitive Absorption as the user's experiential value to study the user's deep participation in using fitness APP.

2.2 Motivation Theory in the Use of Fitness APP

Users who use fitness apps are motivated by two things: extrinsic motivation and intrinsic motivation. Motivation is what motivates people to motivate themselves and take positive action[18].self-determination theory emphasizes that people's behavior is closely related to their needs and self-determination, and points out that people's motivation has different types of motivation, such as intrinsic motivation and extrinsic motivation, different types of motivation have different self-management processes, which will lead people to adopt different goal-orientation in the process of behavior, and so produce different results[18]. Intrinsic motivation refers to the pleasure and satisfaction of performing an activity in the course of its occurrence, while extrinsic motivation refers to the motivation to perform an activity in order to fulfil an extrinsic goal/satisfy an extrinsic constraint[19], but more often it's a mixture of internal and external motivations. For example, a user's initial motivation to adopt a fitness APP might be a desire to achieve a physical change, while the motivation to engage in continuous exercise at a later stage might translate into the pressure of participating exercise teams to monitor and the team's sense of honour, or a reward for completing a task[20].

The influence of the use of fitness APP on users' perceived value needs to be considered from the internal factors and external environment. Users' different exercise motivation affects their choice of fitness function and ultimate perceived value to different extent.

2.3 Fitness Technology Features of the Mobile Fitness APP

Fitness technology function is a function designed to support fitness in fitness APP. James conceptualizes the function of fitness technology as "The collection of fitness technology function set", this paper summarizes the main technical functions of "Social interaction function set", "Movement control function set" and "Data management function set"[21-22]. The social interaction Feature (SIF) allows users to share Exercise information with others, encourage each other, compare races, and so on. The Exercise Control Feature (ECF) allows users to set their Exercise goals before exercising through an APP, the function of Data Management (DMF) includes the function of collecting, recording, updating and analysing personal physiological Data and exercise Data, and so on.

Fitness technology functions provide users with an alternative fitness environment to support[7]. It can help people with high internal motivation to complete exercise more efficiently, and it can also attract inactive people to adjust their negative attitude and encourage individuals to participate in exercise by changing the environment[23]. Users with different exercise motivations often choose different fitness technology features[24].

in this study, Magnia examined the effects of pleasure and tools on users' willingness to use information systems, pointing out that in the early stages of information technology use, users could not identify the potential benefits of information technology, but in the subsequent course of use, as user motivation becomes internalized, users may be more willing to perceive the potential benefits of information technology[24]. The same information system works differently for different people in different environments. The theory of technology availability also points out that the interaction between users of information system, system and environment determines the ultimate value of information system, users with different exercise motivation will have different perceived value to the same fitness technology function[25].

2.4 Theory of Task Technology Matching

Task Technology Fit (TTF) originated from the field of information system, which is mainly used to study the initial application of information system, to have a positive impact on individual performance outcomes. TTF explores the impact on user information system usage by focusing on the matching between user characteristics, job characteristics and technical characteristics. Larsen et al pointed out that the task technology matching theory has great potential in explaining the continuing use of information systems by users[26].

Whether the different function of fitness technology can help users with different motivation to complete exercise is the key to affect the perceived value of users. TTF provides a theoretical framework for the research of this paper: In the environment of Fitness App, user features refer to the user's motivation to use the fitness APP, and technical features refer to the functions that the fitness APP provides for users, the task characteristics refer to the exercise activities that the users need to complete through the fitness APP; the task-technology matching degree is the degree to which the functions of different fitness apps can meet the needs of different types of users, it reflects the configuration of different users' motivation characteristics and different functions of fitness APP, which will directly affect the users 'perceived value

2.5 Qualitative Comparative Analysis

Qualitative Comparative Analysis (QCA) is a kind of research method considering both "Configuration comparison" and "Set theory", and it is also an Analysis tool. QCA explores the "Configuration effect" of antecedents by exploring how different combinations of antecedents lead to different results. The essence of QCA method is to find the most typical, the most concise and the most core reason combination path. In particular, for some complex or multiple factors combined by the results of the case, QCA to do is to continue to simplify the combination of complex conditions, to eliminate redundant variables and contradictory combination, thus, the key factors and the combination of key conditions that influence the results are found, and the relevant interpretation model is established[27]. This case-oriented approach finds out the causal relationship between the configuration of antecedents and the final outcome by comparing the cases, i. e. which combinations of antecedents and conditions lead to the appearance or non-appearance of the expected outcome. Compared with traditional methods such as OLS regression and structural equation modelling, QCA can better explain the asymmetric effect in causality.

There are many kinds of adaptive relationships between users' exercise motivation and the function selection of mobile fitness APP, and different path relationship paths will lead to different users' perceived value, and the combination of factors that produce the same perceived value is often different. The main reason for this study is that the Fuzzy Set Qualitative Comparative Analysis (FSQCA) method has more advantages than the former two methods in the aspects of antecedent-cause complexity and cause-effect asymmetry. The antecedents and conditions of many sociological managerial phenomena often affect each other, while the traditional regression analysis and structural equation models often assume that independent variables are independent of each other and that there is a superposable linear relationship between independent variables and outcome variables, then the complicated high-order mediation and regulation model is derived, but the traditional statistical method is not flexible in analysing the complex problem of interaction of several antecedent variables, which provides an opportunity for the development of QCA method[28-29]. In the real world, causality is a kind of multiple concurrent causality with asymmetry, that is, when a given antecedent condition and different antecedent conditions may have different effects on the result variable. This is highly consistent with the inherent logic of the research question to be explored in this study, which is why users who choose the same fitness APP function in some cases have a positive impact on high user perceived value, but in some cases also have a negative impact, these can be further explained and answered through configuration analysis.

III.   RESEARCH DESIGN

3.1 Sample Selection and Data Sources

This research adopts the questionnaire survey method, selects the internet fitness industry representative KEEP APP as the background platform of the scene design, through the questionnaire survey way

reclaims the data, reclaims the questionnaire altogether 342, after eliminates the invalid questionnaire, the efficiency is 96.20% . The criteria for invalidation of the questionnaire include: incomplete filling-in, that is, not answering the sub-questions, or missing important information, or choosing the same option in all the questionnaires; Or choose to have never heard of or used any exercise or fitness APP; and complete the questionnaire in less than 120 seconds. According to the QCA method, the sample data should be able to cover all the conditions that may lead to a specific result. In this study, the effects of five factors, such as different exercise motivation and fitness APP function, on the perceived value of users were investigated, the 329 samples cover all possible logical types in theory, allow a clear distinction between random and real data, and guarantee the inherent validity of the results.

The proportion of men and women in the effective sample is about 4:6, the proportion of high-frequency users (more than 5 times a week) is about 13% , and about 60% of users use 1-2 times a week. More than 50% of the users have more than half a year's experience in using the APP, which ensures the reliability of the survey data.

The online questionnaire used in the study follows the procedure of "Translation-back translation", through the steps of English-Chinese translation, discussion and diagnosis, and expert interview, so as to ensure the rationality and validity of the scale design, then the questionnaire which is easy to understand and accord with the reliability and validity index is formed. The Likert-5 scale was used for all scales, and 1-5 indicated from "Strongly disagree" to "Strongly agree".

Table 1: Definitions and Sources of variables

Construal	Variable	Implications	Source
Individuals Exercise motivation	Extrinsic motivation	The motivation of an individual arising solely from external stimuli.	Markland and Tobin, 2004.
	Intrinsic motivation	The motivation of an individual to improve his or her sense of fulfillment and satisfaction.	Wilson et al. 2006.
Fitness APP Fitness technology function	Motion control	Set exercise goals, give exercise reminders, and reward yourself after your workout.	James et al., 2019.
	Data Management	Record, analyze, manage and update physiological and exercise data.	
	Social interaction	Share exercise information; get support, encouragement and recognition; get guidance, feedback and advice; compare exercise activities.	
Individuals Perceived value	Instrumental value	The utility benefits that users expect to derive from the system, such as improved health behaviors, continued exercise intentions, and increased subjective vitality.	Liu et al. 2017.
	Experiential value	A positive and fulfilling mental state characterized by vigor, contribution, and concentration.	Ayoung Suh et al. 2018.

3.2 Reliability and Validity of the Questionnaire

Reliability was evaluated by calculating Cronbach's alpha, Composite Reliability, and average variance extracted variance (AVE) . Generally, a 0.7 or above Cronbach's alpha, a composite reliability, and an AVE value of 0.5 or above are considered acceptable levels of reliability. The results of the reliability tests in this study are shown in Table 2. All constructs, except for data management and instrumental values, have reached the acceptable levels of Cronbach's alpha, composite reliability, and mean extraction variance. This confirms the general sense of internal consistency reliability of all constructs. In the subsequent outlier analysis, it was found that one measure of the data management function and instrumental value had a poor load on the construct, which may be the reason for the low reliability of the construct. Therefore, we removed this indicator from the subsequent data analysis. At the same time, the aggregation validity and discriminant validity of the questionnaire were investigated. The square root of AVE value was larger than the correlation coefficient between AVE value and other variables. The T value of each item was significant ($p < 0.05$) . The questionnaire had good aggregation validity and discriminant validity.

Table 2: Reliability Test of Questionnaire Scale

Construal	Item	Composite reliability	Cronbach's alpha	Mean extraction variance
Extrinsic motivation	16	0.951	0.884	0.549
Internal motive	4	0.855	0.901	0.597
Motor control function	12	0.943	0.899	0.579
Data management function	17	0.940	0.943	0.485
Social interaction	21	0.959	0.958	0.526

Instrumental value	12	0.894	0.924	0.417
Experiential value	5	0.530	0.905	0.549

Note: the AVE values of data management function and instrumental value construct were greater than 0.5 after the items with lower factor load were removed.

Motivation: The variables were measured using a scale developed by Markland and Tobin and included 20 items on two dimensions, such as "I enjoy exercising". Cronbach's alpha is 0.901.

Fitness APP: This variable was measured using a scale developed by James et al, with 50 items, including the following three dimensions: exercise control, including three sub-dimensions of management by objectives, exercise cue and exercise reward, including 17 items, such as "I will use fitness APP to set my own exercise goals" [21]. Data management, including data analysis, data collection, data update and information search, four sub-dimensions of a total of 12 items, such as "I will use fitness APP to manage my sports data" and so on. Social interaction, including sharing social data, social encouragement, online coaching, activity comparison and activity competition, has 21 items in five subdimensions, such as "I will use fitness APP to share my exercise data with others, such as cumulative exercise time, mileage and so on.". The Cronbach's α values of the three dimensions were 0.899,0.943,0.958 respectively, and the total value was 0.968.

Perceived Value: This variable is based on the APP design framework proposed by Liu and others. This study uses a scale developed by Liu[14], with two dimensions and 17 items, such as "I forget everything around me when I exercise with Keep". Cronbach's alpha is 0.921.

3.3 QCA Data Calibration

FSQCA explores the causal relationship between antecedent conditions and outcome variables from the perspective of set theory, through the sufficient and necessary between the condition combination and the result variable set, we can identify the multiple core paths which cause the result variable to occur. Based on the method of qualitative comparison and analysis of fuzzy sets, the antecedent conditions and results must be calibrated as membership fraction of fuzzy sets. The membership fraction of fuzzy sets represents the degree to which different cases belong to a set, and its calibration process depends on the use of theoretical and practical knowledge, so calibration should not be mechanized data standardization, it is based on practical case theory and knowledge to ensure that the membership score is reasonable at the case level[30]. With reference to the standard of three calibration points set up by Fists, 5, 3 and 1 are respectively calibration points of complete non-subordination, intersection and complete subordination[31]. The final calibration results are shown in table 3 below.

Table 3: QCA Analysis Data Calibration

Causal condition	Descriptive statistics			Calibration rule		
	Mean value	Maximum value	Minimum value	No affiliation at all	Cross Point	It's all part of it
Instrumental value	3.76	5	1	5	3	1
Experiential value	3.12	5	1	5	3	1
Extrinsic motivation	3.26	5	1.50	5	3	1
Intrinsic motivation	3.87	5	1	5	3	1
Social interaction characteristics	3.01	5	1	5	3	1
Motion control characteristics	3.65	5	1.50	5	3	1
Data management features	3.79	5	1.71	5	3	1

IV. DATA ANALYSIS AND RESULTS

4.1 Necessity Analysis

QCA first needs to carry out the necessity test of a single antecedent condition[30]. Consistency of the fuzzy subset relation of necessity represents the proportion of the intersection of the result set Yi as a subset of the condition set XI in the component set XI, and when Consistency ≥ 0.9 the antecostal condition is immediately considered to be a necessary condition of the result.

The consistency coefficient shows (see table 4) that intrinsic motivation and data management feature sets are necessary for instrumental value; for low instrumental results, no external motivation * no internal motivation * no social interaction feature set * motion control feature set * data management feature set is its necessary condition; for high experience results, internal motivation * motion control feature set * data management feature set is its necessary condition. In other words, the appearance of these outcome variables is often accompanied by the combination of these key antecedents.

Table 4: Necessity Analysis

Antecedent variable	Result variable			
	High instrumental value	Low-tool results	High experience outcome	Low experience outcomes
Extrinsic motivation	0.767	0.861	0.874	0.735
~ extrinsic motivation	0.525	0.918	0.551	0.769
Intrinsic motivation	0.914	0.918	0.946	0.857
~ intrinsic motivation	0.329	0.731	0.362	0.508
Social interaction feature set	0.674	0.757	0.791	0.630
~ social interaction feature set	0.592	0.950	0.603	0.837
Motion control feature set	0.896	0.904	0.940	0.849
~ motion control feature set	0.386	0.848	0.438	0.599
Data management feature set	0.935	0.915	0.963	0.880
~ data management feature set	0.340	0.817	0.397	0.546

4.2 Analysis of Configuration Effects

FSQCA is based on the selection of the variables and combinations with the highest coverage and coincidence among all the condition combinations[32]. Conditional combination is to measure the effect of different combinations of conditional variables on the result when a single variable does not constitute a necessary condition for the result. In practice, the reliability of the test results is primarily measured by consistency and coverage[33]. Consistency refers to the degree to which the combination of user's exercise motivation and the function of mobile fitness APP conforms to the user's high perceived value, while coverage refers to the degree to which a certain configuration is unique in causing the user to obtain the high perceived value. The study chose a minimum acceptable case number of 3 and a coverage rate of 80% in its sufficiency and necessity analysis, which exceeded the minimum coverage rate of 75% recommended by Ragin[34]. Table 5 shows 6 antecedent configurations obtained by FSQCA, including 5 conditional configurations with high instrumental value and 1 conditional configurations with high experiential value.

Table 5: Conditional Configuration Analysis

	Instrumental value					Experiential value
	IV1a	IV1b	IV2a	IV2b	IV3	EV1
External motivation	⊗		●	●		●
Internal motivation			●	●	●	●
Exercise control		●			●	●
Data management	●	●		●		●
Social interaction	⊗		⊗			●
Coverage	0.4500	0.870	0.470	0.730	0.870	0.730
Pure coverage	0.010	0.030	0.010	0.010	0.030	0.730
consistency	0.970	0.960	0.970	0.980	0.960	0.900
Overall coverage	0.930					0.730
Overall consistency	0.940					0.900

Note: ● and ● mean that the condition exists, and ⊗ and ⊗ mean that the condition does not exist, ●and ⊗ andas core condition, ● and ⊗ as auxiliary condition.

There are five configurations of antecedents leading to high instrumental value outcomes, which can be divided into three categories according to the intensity of users' exercise motivation: weak motivation (IV1a, Iv1b) , hybrid motivation (IV2a, IV2b) and strong motivation (IV3) .

One of the models leading to high instrumental value for users is the weakly motivated organization IV1a and IV1b, where the aggregation relationship expression of the IV1a configuration can be expressed as: ~ External Motivation * data management * non-social interaction, and IV1b is: Motion Control * Data Management. The construct IV1a indicates that when users do not have the external motivation to exercise, the fitness APP also has strong data management function without social interaction function, which can support users to acquire high instrumental perceived value. Configuration IV1b indicates that when the user does not

show exercise motivation, the fitness APP also shows strong data management function, which can support the user to obtain high instrumental perceived value. Therefore, from the point of view of the user's exercise motivation, when the user's exercise motivation is weak (no external motivation, no obvious motivation), fitness apps need to reflect a strong data management function and weak social can support users of high tool-type perceived value. It also shows that the attraction of tools such as fitness APP for users with weak exercise motivation lies in its data management function, which has a positive effect on the perceived instrumental value of users without specific motivation, too prominent a social function can be counterproductive.

The second model of high instrumental value for users is a hybrid construct (IV2a, IV2b) , which indicates that the core conditions leading to subjective vitality of users are IV2a: internal motivation * external motivation * ~ social interaction and IV2b: internal motivation * external motivation * data management. The two configurations share the same core conditions of external motivation and internal motivation, that is, such users will show that they want to actively regulate their health, but also face a certain amount of external pressure to exercise. For such users, achieving high perceived instrumental value requires that fitness apps highlight stronger data management capabilities and reduce the presence of social features.

The third mode with high instrumental value of users is the mixed motivational configuration and the strong motivational configuration (IV3). For the exercise users who only show the type of internal motivation, they have a strong motor motivation, and the simple motion control function can support them to obtain a high perceptual instrumental value.

There is only one configuration of the antecedent-condition combination that leads to the result of high perceived experiential value, users with both internal and external motivations need to be supported by data management, movement control, and social interaction in order to obtain higher perceived experiential value. In contrast to instrumental value, experiential value requires that the user does not have too strong or too weak motivation to exercise, users who are in the state of mixed exercise motivation will be more likely to have higher experiential value if they are supplemented with the in-depth understanding and use of the fitness APP function.

V.   FINDINGS AND DISCUSSION

5.1 Findings

The results show that: there are five modes to trigger users to acquire high perceived instrumental value. From the point of view of user motivation, there are different ways for users with different exercise motivation to trigger high instrumental value. When the user motivation is weak, the enhancement of high instrumental value requires the combination of functions, and as the user motivation increases, the function requirement tends to be a single fitness APP function, such as data management or motion control. From the functional value of fitness APP, the social function of fitness APP has a certain negative effect on users' acquisition of perceived instrumental value. For instrumental products, although the rich construction of function can make the user have an immersive experience, and thus enhance the user's perception of instrumental value, it is important to note that the function is presented too much, some functions beyond the user's psychological expectations will not only not enhance the user's perceived instrumental value, and may even arouse the user's antipathy[35]. For example, for some less motivated or more externally motivated users, the presence of strong social features can deepen the comparison between users and community users to the extent that they perceive others to be more successful than themselves, users feel frustrated and fatigued, resulting in a lower perceived instrumental value and a higher intention to interrupt[35-36]. And when users become aware that other users are observing their physical activity, which leads to feelings of peer monitoring and fear of being negatively judged by others, this can create a certain amount of stress for users[37]. The presentation of social function is not always helpful to enhance the stickiness of users, and the presentation and gradual guidance to users with different motivations are the right way to enhance the users 'perceived value.

There is a pattern of triggering users to achieve high perceived experiential value[38]. The perceived experiential value of the user is distinct from the perceived instrumental value, and the perceived experiential value is a combination of utilitarianism based functional benefits and emotional benefits based on the hedonistic perspective, it emphasizes not only the instrumental benefits that users get from using these products, but also the enjoyable experience that users have after using these products and the continuous participation of users. The results show that there is only one combination condition to obtain high experiential value, which shows that the users have mixed motivation and have a strong tendency to use all the functions of the fitness APP. It requires users not to display a single internal or external motivation, because a purely external motivation may make a light hearted exercise feel more like work, which to some extent reduces the enjoyment of the exercise itself. And a strong internal motivation can make it easier for users to ignore other features outside the core of the fitness APP, such as data management and social networking. Therefore, one of the premises of high experiential value is that the user is in a mixed state of external motivation and internal motivation, and has a strong frequency of use of the functions provided by the product, not limited to the use of a function.

5.2 Theoretical Contributions

How to use mobile fitness APP to improve users' perceived value has been paid more and more attention by enterprises and academic circles, but most researches focus on the influence of single condition variable on users' health level, there is little emphasis on the causal relationship between users 'motivation and fitness APP's adaptive path and users 'perceived value. In this paper, the FSQCA method is used to make the whole causality be presented by the configuration combination of the antecedents rather than by the linear relationship of any single dependent variable to the independent variable. This is the conclusion which the traditional analysis method based on regression cannot get. The configuration perspective and the QCA analysis provide us with a new perspective and tool. Through the whole analysis and case-to-case comparison, we reveal the configuration effect among the important conditions that influence the results, and discover the multiple combination paths that produce the results, for the fitness platform operators to take measures to provide more pertinent program recommendations.

Previous studies on fitness apps often focus on some utilitarian factors, such as the discussion on perceived ease of use and perceived instrumentality, but to a considerable extent ignore the matching degree of user motivation and fitness APP functions as well as the factors of experiential value. In order to fill this gap, this study attempts to explore the impact of different configuration effects between users' motivation to use fitness apps and fitness APP functions on instrumental and experiential perceived value.

5.3 Practical Implications

One of the main goals of health APP is to guide users' health behaviors, and platform enterprises need to understand user portraits to provide personalized services. Are users driven by internal or external factors? What types of functionality do different types of users tend to use? What kind of motivational users can easily lead to high perceived user value by using what features? The results of this article gives some management practices revealed: (1) fitness APP as a kind of instrumental value of the products, the social interaction function is not the same as the function of social media, instrumental value for the user to enhance perception not positive role, in the process of platform enterprises need not exercise motivation of different types of users targeted services, appropriate adjustment function layout. (2) Users in a mixed state of external motivation and internal motivation are more likely to improve their perceived experiential value, which also requires the platform to gradually guide them through more refined and personalized functional services.

5.4 Deficiencies and Outlook

The results of this study reveal a complex relationship between users' motivation to exercise, fitness function, and perceived value of using fitness apps, but also their limitations. First of all, our sample only includes users of KEEP APP. Although KEEP has a large share of the mobile fitness APP market in China, the sample of users who choose a single product is biased and may have brand effects. Second, although FSQCA allows us to examine the configuration of the factors that lead to both experiential and instrumental results, the process of doing so is not well explained. Additional research using qualitative research methods may reveal additional insights on this topic. Thirdly, this study is based on the cross-sectional analysis of one-off survey, and lacks longitudinal follow-up study, so it is difficult to reveal the dynamic changes of technology task matching and its impact on performance. At different stages, with the change of cognition of task characteristics and technical characteristics, as well as the change of individual characteristics, the degree of matching of technical tasks and the degree of influence on performance will change, these changes and the change of the internal law and the interaction mechanism is also worth studying and exploring the field.

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