Original Research Article

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Examining communication effectiveness in multicultural fitness programs-multivariate analyses

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Abstract

Objectives: The objective of this study was to examine communication effectiveness (CE) in conjunction with participant satisfaction in a multicultural fitness program.
Methods: Adults from a fitness program site with participant diversity and multicultural backgrounds were selected and asked to complete a three-part Fitness CE Evaluation Scale questionnaire: CE Questionnaire and Customer Satisfaction (CS) Scale plus a short demographic survey. A sample of 95 participants was recruited from a Midwest Functional 45 Fitness Training Program site in the U.S.A. Multivariate Analysis of Variance (MANOVA) tests were conducted for CE and CS variable vectors.
Results: The results showed that there were significant main effects on CE and CS for nationality ($p=0.001$; $p<0.001$) and language ($p=0.006$; $p<0.001$), but no effect for participation frequency, respectively; there were also significant main effects on CS for gender ($p=0.006$) and membership type ($p=0.019$). Univariate tests revealed that domestics and/or first language participants scored significantly higher on reaction to strangers ($p=0.001$; $p=0.001$), uncertainty ($p<0.001$; $p<0.001$), facilities/services ($p<0.001$; $p<0.001$), individual/psychological factor ($p=0.009$; $p=0.034$), relaxation ($p=0.018$; $p=0.021$), social factor ($p<0.001$; $p=0.002$), and health/fitness ($p<0.001$; $p=0.001$), respectively.
Conclusions: Being highly aware of fitness participants' uncertainty and reaction to strangers can help multicultural fitness program managers or trainers improve their communication effectiveness, which will continue improving their customers' satisfaction.

Keywords: communication effectiveness; customer satisfaction; fitness program; anxiety/uncertainty management theory; multicultural setting

Introduction

Participants' satisfaction of fitness programs or services is known as an important predictor for their continued use of the facilities and participation of the fitness programs [1–7]. Research has also documented that an effective communication between management, trainers, and participants is crucial to maintain high participant satisfaction and continued participation in fitness programs. It has also been proved that effective communications would have great benefits for participants' health and wellness output [8–10]. The more effective communication is between a fitness program participant and their fitness trainer, the more satisfaction will be in their training experience and ongoing fitness participation [11–13] (Figure 1).

The IBISWorld (2020) industry report indicated that the Gym and Health and Fitness Clubs industry has shown an increasing trend of fitness participation globally in the past two decades [14]. As globalization continues, there is an increasing likelihood that individual fitness settings in colleges, industries, and metropolitan communities will experience greater multicultural diversity in their trainer teams and client bases [15]. The concept of culture in workplaces has been an inseparable factor of communication in the context of globalization [16–18] and the ability of effective communication has been a challenge in globalization [19, 20]. As cultural heterogeneity expands in the fitness setting, there would be a greater opportunity for misinterpretation or non-effective communication among trainers and clients [15, 18]. To fill this gap in the literature, the purpose of this study was to examine communication effectiveness in conjunction with participant satisfaction in a multicultural fitness program. The objective

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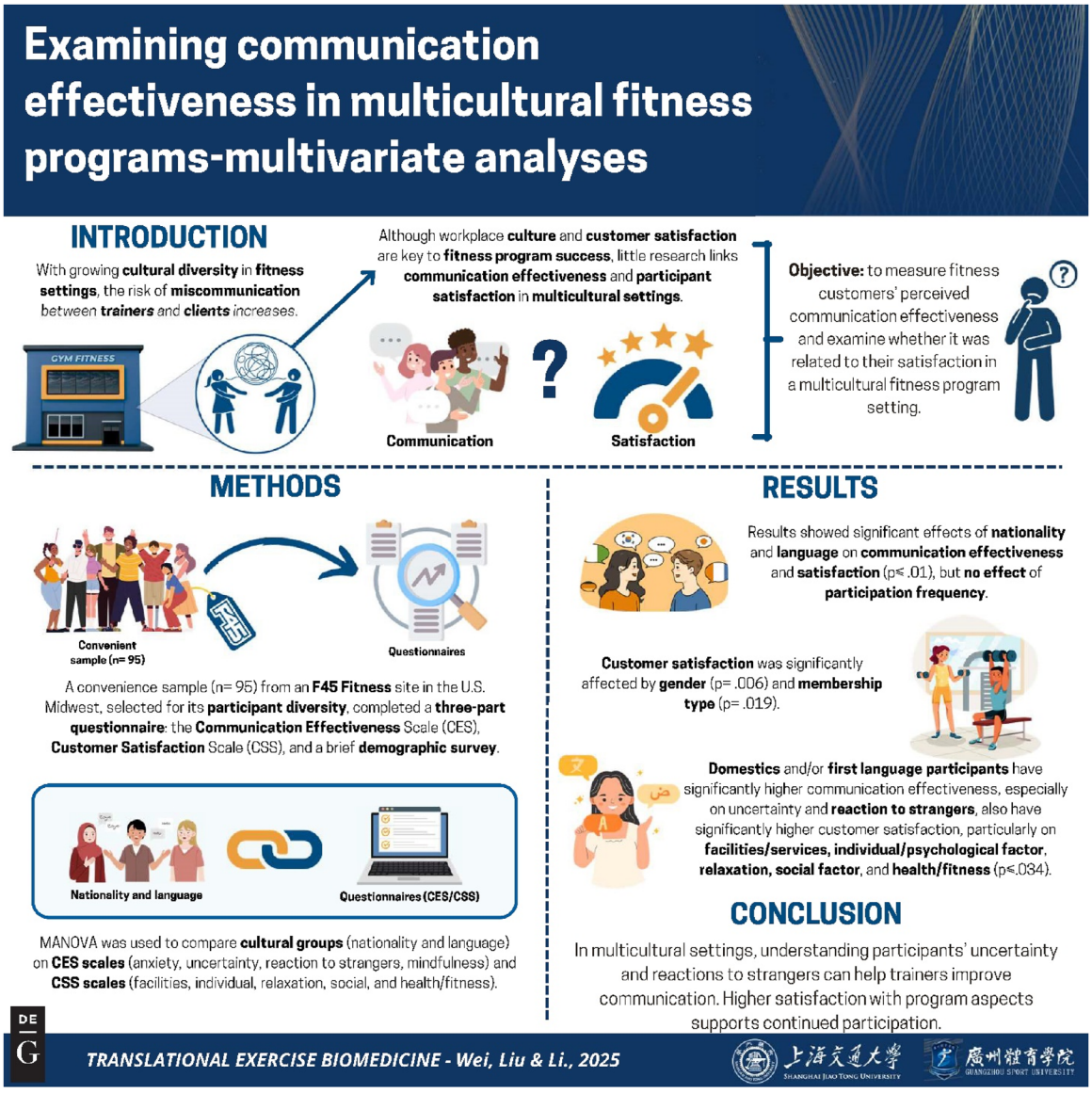

Figure 1: Graphical representation of this study. Key points: (1) As globalization continues and cultural diversity extends to fitness settings, more frequent occurrence for misinterpretation or non-effective communication among trainers and clients has globally challenged the management to develop effective communication strategies in order to satisfy diverse fitness customers' needs. (2) A convenient sample – F45 Fitness Program site from Midwest region in U.S.A with participant diversity and multicultural backgrounds was selected to complete a Fitness Communication Effectiveness Evaluation Scale questionnaire. (3) Being highly aware of fitness participants' uncertainty and reaction to strangers can help multicultural fitness program managers or trainers improve their communication effectiveness, which will continue improving their customers' satisfaction. Figure created with BioRender.

of this study was to measure fitness customers' perceived communication effectiveness and examine whether it was related to their customer satisfaction in a multicultural fitness program setting. It would help fitness program managers or trainers understand how communication effectiveness may affect their fitness participants' satisfaction. The results would further guide them to develop effective communication strategies to improve their customer satisfaction.

Literature review

Communication and effective communication

Communication is a process that is involved with "the exchange of messages and the creation of meanings" [21, 22]. Effective communication is defined as a person's ability to

successfully communicate messages in home, community, and/or work settings to fulfill life roles [23–25]. Effective communication occurs when the meaning that is intended or transmitted by the source is interpreted by the receiver to have the same meaning [21]. Health policy makers and marketers have encountered challenges to achieve effective communications, which is affected by how much their clients can manage the level of their anxiety and how accurately they can predict their clients' attitudes and behaviors [17]. To promote consumer's awareness of potential risks associated with health-relevant products and services, it would be greatly needed to design effective communication methods that could significantly impact consumers' awareness, attitudes, and behaviors.

Multicultural communication

The multicultural communication studies often seek to identify cultural differences in the communication exchange [20, 24]. With the increasing trend in globalization, it is expected that globalized fitness programs will face the challenges due to more diverse cultures and languages [26]. As cultures and languages are closely intertwined, it is not surprising that difficulties and confusions can occur among people with different cultural backgrounds [27–30]. This can become exacerbated across multicultural boundaries [20, 24, 30]. Cultural diversity may influence even the manner in which people from different cultures engage in communication and interaction [15, 17, 27, 31].

In the multicultural environments, effective communication is improved when individuals have a greater understanding of each other's expectations and cultural backgrounds [23, 26, 28, 31]. The culturally astute program managers may have an awareness of how to avoid offensive situations and eliminate confusion in the multicultural setting [15, 31]. Globally oriented organizations need program managers who can adapt to cultural diversity and communicate effectively in multicultural situations [16, 18, 31].

Anxiety/uncertainty management theory

The Anxiety/Uncertainty Management Theory AUMT [22, 32] has been widely utilized to study interpersonal and intergroup communication effectiveness. It is especially applicable to interpersonal and intergroup relationships across cultures [17, 29, 33]. AUMT suggests that effectiveness of communication is a function of an individual's abilities to manage both their uncertainty and anxiety [21, 31, 32, 34]. Managing uncertainty and anxiety are the central processes influencing the communication effectiveness with others across relationships and culture [17, 22, 29, 33].

Anxiety

A person's anxiety was defined as "a generalized or unspecified sense of disequilibrium", which is a type of affective feeling [17]. An individual experiencing anxiety when they communicate with others is generally based on their negative experience [28, 29]. An individual generally has maximum and minimum thresholds for anxiety [33]. The maximum threshold for anxiety is referred to the highest amount of anxiety an individual can have and feel comfortable to interact with others, while the minimum threshold is the lowest amount of anxiety an individual can have and care about their interaction with others. When an individual's anxiety is between their minimum and maximum threshold, they will feel easy to process and motivated to communicate with others. Effective communication requires an individual's anxiety to be managed between their minimum and maximum thresholds [17, 28, 33]. If not well managed, it easily leads to an individual's avoidance or withdrawal [17, 28, 33].

Uncertainty

Uncertainty is the cognitive equivalent of anxiety [35, 36], which is defined as "inability to predict and explain our own and others' behavior" [17, 21, 28]. The degree of uncertainty greatly exists in all relationships, but it becomes higher when the individual communicates with strangers comparing the ones whom they have intimate relationships with [17]. An individual's uncertainty makes them feel uncomfortable and leads to ineffective communication with others [17]. Similar to anxiety, an individual also has maximum and minimum thresholds for uncertainty [33]. Their maximum threshold is regarded as their highest amount of uncertainty they have and think they can sufficiently predict others' behavior and feel comfortable to interact with. Their minimum threshold is referred to as their lowest amount of uncertainty they have and do not feel bored or overconfident to interact with others. When an individual's uncertainty is between their minimum and maximum thresholds, they have sufficient confidence in their abilities to explain their own behavior and predict others' thoughts, feelings and behaviors that they feel comfortable with [33, 37]. To achieve effective communication, it requires an individual's uncertainty to be managed between their minimum and maximum thresholds [28, 33].

Reaction to strangers

The increase in anxiety and an individual's own interpersonal uncertainty about being among strangers can get exacerbated in the multicultural communication exchange [22, 28]. When an individual interacts with strangers or

people from other cultures, their anxiety generally gets increased [28, 33]. To achieve effective communication, aside with the ability to manage their anxiety and uncertainty, it also requires an individual with the ability to manage their reaction to strangers [22, 31, 34]. If one individual can effectively manage their interpersonal uncertainty and keep their anxiety from rising during a communication exchange with strangers, they are more able to adjust to the new environment and potential culture differences. AUMT indicates that this may lead to their commitment to stay engaged in the communication exchange [22, 28, 32]. When an individual's anxiety and uncertainty become too high, it will negatively impact their ability to adjust to the multicultural nature of the communication exchange with strangers and thus decrease the communication effectiveness [28, 34]. Continued failure of successful communication may result in avoidance with strangers or premature end to a conversation resulting in communication failure [28, 34].

Mindfulness

Mindfulness is a reflection process on the anxiety-uncertainty of others. It serves as an interplay factor that can contribute to the improvement of anxiety-uncertainty condition [29, 38]. When an individual manages anxiety and uncertainty during an interaction with strangers, it also requires them to be mindful of themselves and each other [21, 22, 29, 32]. When an individual is mindful of the impact of cultural differences with strangers, they tend to predict the strangers' national behavior (e.g., ethnicity, gender, or role) that may impact communication effectiveness [22, 33, 39]. They are more open to alternative perspectives and perhaps can make more accurate predictions of the strangers' attitudes and behaviors which would increase communication effectiveness [17, 29, 31]. Being mindful would allow them to communicate and share their experiences and knowledge as well as being receptive to the knowledge and experiences of others [17, 31].

Customer satisfaction

Customer satisfaction is defined as a person's feelings or evaluation of products or service post consumption [5, 40–43]. If the product or service meets or exceeds a customer's expectation, the customer is more likely to be satisfied and will be more likely to return and repurchase [5, 9, 44]. While if it is below their expectation, it leads to dissatisfaction, and the dissatisfied customer is more likely to drop out [43]. Sport and fitness centers are customer-orientated organizations [44], where customer satisfaction is one of the crucial aspects for success of the organization [6, 44–46]. This becomes even more important in competitive industries, such as when industries are rapidly expanding their customer base [46], so as in the global fitness sector.

In multicultural fitness settings, fitness participants are exposed to a diverse cultural background where they often encounter many strangers. Their attitudes and behaviors regarding their anxiety, uncertainty, reaction to these strangers and mindfulness to the multicultural background may affect their perceived communication effectiveness. How an individual identifies the group they are in is impacted by the communicative culture, which has positive effect on their satisfaction [10]. AUMT may serve as a bridge to connect and understand the relationships between fitness participants' perceived communication effectiveness and their satisfaction with the fitness programs in a multicultural setting.

Materials and methods

Study setting

A Functional 45 Fitness Training (F45) program was selected because the program has been growing fast globally in the last decade. One part of the cultural diversity comes from the F45 site as chosen with multi-culture in nature for this study, another part comes from the F45 fitness program itself as it has been operated globally with the participants from all over the world to follow the same instructions and participate in same training sessions. The F45 program was founded in 2012 and officially registered in 2013 [47]. According to F45 official website, there are about 1,760 studios and 45 countries in the world, with an average of 250 new openings per year globally [47]. This expansion attests to the multicultural fitness training approach utilized by the F45 program as claimed by the Global Head of Sales for F45 Luke Armstrong [48]. The success of F45 program relies on delivering premium customer service every single day, where the trainers are in the front line who consistently interact and communicate with customers and deliver the services face to face.

During each F45 fitness training session, there are two trainers, one is the lead instructor who does the demonstration, while the other "talker" introduces the structure of each training session and the instructions for each workout. Their performances are valued and followed the standardized workout script format mainly in five steps: 1) warm salutation, introduce trainers and inquire about new participants and their injury history; 2) introduce workout name, explain timing/rest/sets/laps and do demonstrations; 3) divide participants into groups and assign them to their initial workout stations; 4) guide the participants to follow the workout demonstrations from the televisions to do warm-up, training, and cool down; and 5) interact with the fitness participants and assist them when help or additional

instruction is needed until the whole training session ends. Based on the daily standardized operation model, the training sessions and content of communication are controlled for all fitness participants.

Participants

The aimed population of this study was those from the fitness centers that served a multicultural population of fitness participants. The convenient sample site – F45 site was from the Midwest region in U.S.A. with a diverse multicultural participant base, which is located in a university setting and also allows the community citizens to participate in their fitness programs. The results and research findings are intended to be used in the population which are global universities and multicultural communities. G*Power (version 3.1.9.4) was utilized to calculate the sample size for this study, as the parameters were set up as: 1) F tests for test family; 2) MANOVA global effects for statistical test; 3) 0.5 for large effect size. Given the scenario of this study, the *a priori* test showed that the needed sample size should be at least 86, where the actual power would be at least 0.952. For post hoc analysis, given 95 participants recruited for this study, the power of this study would be at least 0.972, which proved the sufficiency of the sample has been collected.

In this study, nationality and language are the two major sources leading to the cultural diversity. In terms of nationality, participants were classified into two groups: domestics and internationals, where the domestic participants included White American, Black or African American, American Indian or Alaska Native, Asian American, Hispanic or Latino, native Hawaiian or other Pacific Islanders, while the internationals refer to the non-U.S. citizens, such as the individuals who are originally from China, Indonesia, Thailand, Costa Rica, Dominican Republic, Australia, and the Netherlands. Regarding language, since the trainers in F45 site are domestic athletic trainers and speak English for fitness training communication, the first-language cohort in this study refers to the participants who speak English as the first language. For those whose first language is not English, such as Chinese, Spanish, Bahasa Indonesia, Thai, Dutch, and Amharic, they are considered as non-first language participants. Both nationality and first language were assessed by participants' self reporting.

Measures

The Fitness Communication Effectiveness Evaluation Scale (FCEES) questionnaire was developed with three parts: *Communication Effectiveness Scale* (CES), *Customer Satisfaction Scale* (CSS), and a short demographic survey. The FCEES was developed in English language with a Likert scale that ranged from 1 to 6-point responses (where 1 was strongly disagree, 2 disagree, 3 slightly disagree, 4 slightly agree, 5 agree, and 6 strongly agree). Demographics (e.g., gender, nationality and first language) were also obtained, which were used as control variables.

Communication effectiveness

Communication effectiveness was measured by CES which was adopted from Mukherji and Jain's study of multicultural communication effectiveness in a business setting. The CES was developed based on the application of AUMT. Modifications of CES were referred to AUMT.

Anxiety was measured by six items via fitness participants' worriedness (3 items) and their self-concept (3 items). The fitness participants who scored high in this factor are more worried when they communicate with others and would like to manage their self-esteem to avoid biases and decrease their anxiety [31]. This reveals the efforts that fitness participants take to manage their anxiety to be between their maximum and minimum threshold. They were phrased as "I am worried about …" and "I am open-minded …".

Uncertainty was accessed by attributional confidence, where the higher score, the greater the attributional confidence [31]. In this study, uncertainty was measured by eight items via the degree of fitness participants' attributional confidence when they communicate with fitness trainers regarding their interaction as well as seeking for help, feedback and encouragement. This indicates the efforts that fitness participants take to manage their uncertainty with trainers to be between their maximum and minimum threshold. It was phrased as "I am confident to …".

Reaction to strangers refers to an action that an individual tries to decrease uncertainty and anxiety through interacting with strangers who have similar culture or background with themselves and cultivating interdependent relationships with the strangers [31]. In this study, reaction to strangers was measured by 10 items via fitness participants' willingness to understand others' background, pay attention to others' cultural and change their communication style in order to better interact with strangers. It was phrased as "I am willing to …".

Mindfulness implies an individual being open to new information and recognizing that others may have different perspectives. It refers to an individual's ability to interpret information using the frame of strangers' reference and try to avoid communication barriers [31]. In this study, mindfulness was measured by four items which were phrased as "I am mindful of …".

Consumer satisfaction

Alexandris and Palialia's CSS was adopted to measure fitness program participants' satisfaction [49]. Five factors were measured: facilities/services, individual/psychological, relaxation, social, and health/fitness.

Facilities/services were measured by five items. Minor modifications were made on the measures of service regarding "the instructors are friendly" "the instructors give helpful advice". In this study, "trainers" was utilized instead of "instructors", as it is how the sampled fitness participants call their mentors in the content of their fitness program. The measures of facilities regarding "the facilities are well designed/clean/attractive" stayed the same as Alexandris and Palialia's CSS. Fitness participants who scored high on this factor would view this fitness program having attractive, well-designed, and clean facilities, and the staff being friendly and helpful [49].

Individual/psychological factor was measured by six items. Minor modifications were made to fit the content of the sampled fitness program in this study. The phrase in Alexandris and Palialia's CSS, "exercising in the centre …", was replaced with "exercising in the F45 program …". The rest of the statements remained the same. Fitness participants who scored high on this factor would view exercising in the F45 program as being interesting, intellectual, and giving a sense of involvement [49].

Relaxation was measured by three items. Same as Individual/psychological, minor modifications were made. Only the phrase "the programmes …" was replaced with "the F45 program …". Fitness participants who scored high on this factor would view participating in the F45 program as a way of relaxing and moving away from the daily responsibilities [49].

Social factor was measured by three items. Same as above, only the phrase "exercising in the centre…" was replaced with "exercising in the F45 program …". Fitness participants who scored high on this factor would view participating in the F45 program as a way of socializing and making new friends [49].

Health/fitness was measured by three items. Same as above, only the phrase "the programmes …" was replaced with "the F45 program …". Fitness participants who scored high on this factor would view participating in the F45 program satisfied their health and fitness related needs and expectations [49].

Data collection

The research protocol for this study was approved by the Western Michigan University Human Subject Institution Review Board (HSIRB) to ensure protection of study participants. The FCEES survey was designed and distributed online via survey software Qualtrics. A recruitment email was sent out by the F45 fitness program manager to F45 participants based on the membership lists. Completion of the online survey acknowledged participation consent. The first survey was sent out on May 4, 2020. A reminder email was sent out one week later, May 11, 2020. Recruited participants were classified into two groups: domestic (n_d=66) and international (n_i=29) for nationality, first language (n_f=63) and non-first language (n_n=32) for language, which includes participants who were or are currently registered in the F45 program (See Table 1). The useable responses collected were from 23 males and 72 females. Their age ranged from 18 to 63 years (M=32.93 and SD=11.677).

Table 1: Participant demographics.

	Type	Frequency	Percentage, %
Gender	Male	23	24.21
	Female	72	75.79
Occupation	Student	46	48.42
	Faculty/Staff	41	43.16
	Community member	8	8.42
Membership type	Day pass	14	14.74
	Semester pass	81	85.26
Participation frequency	1–2 days	28	29.47
	3–4 days	42	44.21
	5 or more days	25	26.32
Most frequent F45 participation	Cardio	43	45.26
	Strength	45	47.37
	Hybrid	7	7.37
Language	First language	63	66.32
	Non-first language	32	33.68
Nationality	Domestic	66	69.47
	International	29	30.53

Data analysis

FCEES evaluation

Given that items in the CES and CSS were edited for the purposes of this study to make them more specific to the specific study purpose and sample, both validity and reliability of the revised CES and CSS were examined.

FCEES validity

To maximize FCEES survey administration, execution, and responses, the physical layout and item content (stem and

response scale) for all parts (demographic information, communication effectiveness, and customer satisfaction) were judged by five experts (three full-professors and two fitness program managers). The expert review consisted of multiple passes until no new changes were suggested to make sure the overall survey was accurate, and the flow of the survey was smooth. Additionally, six F45 participants were invited for a pilot study to pre-test the content validity. Feedback and recommendations from these participants related to survey design were discussed among the experts. Modifications and revisions of these items were made accordingly. The analysis was proceeded based on previous structural analysis of these assessments [31, 49].

FCEES reliability

Cronbach's alphas were calculated to assess the internal consistency of each CES and CSS theoretical constructs [31]. In this study, unit weighted item composites were calculated for each construct (dimension) in the CES and CSS. As previously notes there were 28 items comprising four constructs in the CES and 20 items making up five constructs in the CSS. Cronbach's alpha internal consistency estimates for each construct are presented in Tables 2 and 3 along with construct descriptive statistics.

CES and CSS analyses

Following univariate analysis focusing on establishing the legitimacy of the linear model assumption, parallel two sets of MANOVA analyses were used to compare culture groups among the dependent variable vectors. The culture groups were represented by nationality group (domestic/international) and language group (first language/non-first language), respectively. The dependent variable vectors are CES unit weighted scales (anxiety, uncertainty with trainers, reaction to strangers, and mindfulness) and CSS unit weighted scales (facilities/services, individual/psychological factor, relaxation, social factor, and health/fitness). The first set of MANOVAs tested for nationality group differences and language group differences on the CE variable vector, separately. The second set of MANOVAs examined nationality group differences and language group differences on the CS variable vector, respectively.

Additional attempts were conducted on independent variables, such as gender, membership type, participation frequency, to compare group differences among the CE and CS variable vectors, separately. IBM SPSS Statistics 27.0 (IBM Corp., Armonk, NY, U.S.A) was utilized for the data analysis.

Table 2: CE and CS item descriptive statistics and construct scale reliability.

Item of the construct		n	M	SD	Cronbach alpha
Communication effectiveness					
Anxiety	AN1	95	2.85	1.584	0.785
	AN2	95	3.03	1.574	
	AN3	95	3.20	1.541	
	AN4	95	5.32	0.775	0.825
	AN5	95	5.03	0.905	
	AN6	95	5.08	0.871	
Reaction to strangers	RS1	95	5.19	1.014	0.862
	RS2	95	4.98	1.101	
	RS3	95	5.09	0.888	
	RS4	95	5.07	1.064	
	RS5	95	5.05	1.056	
	RS6	95	5.00	1.031	
	RS7	95	5.31	0.876	
	RS8	95	5.27	0.721	
	RS9	95	5.11	1.026	
	RS10	95	5.14	1.088	
Uncertainty to trainers	UT1	95	5.14	1.038	0.901
	UT2	95	5.13	0.959	
	UT3	95	5.16	0.915	
	UT4	95	5.01	1.057	
	UT5	95	5.41	0.869	
	UT6	95	4.80	1.172	
	UT7	95	5.18	0.945	
	UT8	95	5.35	0.809	
Mindfulness	MF1	95	5.01	1.106	0.850
	MF2	95	4.69	1.264	
	MF3	95	4.72	1.048	
	MF4	95	4.45	1.261	
Customer satisfaction					
Facilities/Services	FS1	95	5.61	0.641	0.880
	FS2	95	5.43	0.753	
	FS3	95	5.29	0.861	
	FS4	95	5.34	0.752	
	FS5	95	5.23	0.831	
Individual/Psychological	IP1	95	5.48	0.742	0.896
	IP2	95	5.24	0.896	
	IP3	95	5.00	1.082	
	IP4	95	5.32	0.816	
	IP5	95	5.14	0.985	
	IP6	95	5.47	0.742	
Relaxation	RL1	95	5.13	0.902	0.860
	RL2	95	5.23	0.973	
	RL3	95	5.29	0.898	
Social	SC1	95	4.87	1.132	0.882
	SC2	95	4.71	1.157	
	SC3	95	4.67	1.207	
Health/Fitness	HF1	95	5.59	0.692	0.878
	HF2	95	5.53	0.770	
	HF3	95	5.39	0.903	

Table 3: CE and CS construct descriptive statistics.

		M	SD	Skewness	Kurtosis	KMO	Bartlett's test	
							Chi-square (df)	p-Value
Age		32.93	11.677	0.898	−0.029			
Communication effectiveness								
Anxiety	I am worried about… (3 items)	3.03	1.310	0.084	−0.948	0.651	88.373(3)	<0.001
	I am open-minded to… (3 items)	5.14	0.734	−0.744	0.398	0.721	103.237(3)	<0.001
Reaction to strangers	10 items	5.12	0.663	−0.991	1.861	0.810	498.498(45)	<0.001
Uncertainty to trainers	8 items	5.15	0.750	−1.226	2.030	0.803	497.564(28)	<0.001
Mindfulness	4 items	4.72	0.975	−0.997	1.239	0.753	170.740(6)	<0.001
Customer satisfaction								
Facilities/Services	5 items	5.38	0.635	−1.331	2.527	0.723	319.494(10)	<0.001
Individual/Psychological	6 items	5.28	0.719	−1.356	1.912	0.834	365.282(15)	<0.001
Relaxation	3 items	5.22	0.818	−1.355	1.800	0.679	141.325(3)	<0.001
Social	3 items	4.75	1.048	−0.727	−0.239	0.729	153.771(3)	<0.001
Health/Fitness	3 items	5.50	0.711	−2.217	5.945	0.685	200.252(3)	<0.001

KMO=kaiser-meyer-olkin measure of sampling adequacy; bartlett's test=bartlett's test of sphericity.

Roy's Largest Root multivariate test statistic was selected given that it has greater statistical power than other multivariate tests (e.g., Wilk's lambda) in designs with moderate sample size. In this study, for a factor with more than two levels, then LSD (Least Significant Difference) post-hoc test was applied to seek higher power, since few planned comparisons were needed.

Results

Sample and variable description

Before initiating the parallel MANOVAs, the assumptions of normality of each construct were checked via the skewness and kurtosis values (See Table 3). The Shapiro-Wilk tests indicated that the assumptions of univariate normality were rejected in all variables, except for anxiety. However, deviation away from normality was not severe (skewness and kurtosis value generally < |3.0|). Due to the lack of univariate normality, multivariate normality was not assumed. However, the MANOVA tests are robust to deal with the data without sever violation of the normality assumption. A critical assumption for the validity of the MANOVA is the equality of covariance matrices. This assumption was checked with the Box test for both DV vectors: CES and CSS were found to be tenable for each vector (p=0.105 and p=0.621, respectively). Each FCEES survey was completed independently by each participant.

Communication effectiveness (CE)

A series of MANOVA tests were conducted on culture groups (nationality group and language group) for the CE variable vector. Additional independent variables (e.g., gender, membership type, and participation frequency) were attempted to reveal the group differences on CE. The results showed that there were significant main effects for nationality (*Roy's Largest Root*=0.243, F_{exact}=4.328, p=0.001) and language (*Roy's Largest Root*=0.200, F_{exact}=3.555, p=0.006), respectfully, but no significant main effects for gender, membership type, and participation frequency (See Table 4). Either nationality group or language group, these two factors indicate significant differences exist in communication effectiveness culture groups.

So as to minimize the chance of making a type II error, LSD post hoc analyses for nationality group (domestic/international) and language group (first language/non-first language) were provided for each of the CE constructs to determine the stability of the emergent finding. Univariate tests for nationality group (See Table 5) indicated that domestics scored significantly higher than internationals on reaction to strangers (M_{diff}=0.462, F=10.804, p=0.001) and uncertainty (M_{diff}=0.589, F=14.152, p<0.001); First language participants scored significantly higher than non-first language participants on reaction to strangers (M_{diff}=0.456, F=11.106, p=0.001) and uncertainty (M_{diff}=0.556, F=13.175, p<0.001), respectively. No other CE constructs were noted with significant differences for these two culture groups.

Table 4: MANOVA findings for CE and CS.

	Roy's largest root	F (exact statistic)	p-Value	Partial eta squared	Observed power	Box's test of equality of covariance matrices	
						Box's M	p-Value
Communication effectiveness							
Nationality	0.243	4.328	0.001	0.196	0.956	19.611	0.253
Language	0.200	3.555	0.006	0.166	0.905	25.891	0.063
Gender	0.093	1.663	0.152	0.085	0.553	24.927	0.091
Membership type	0.119	2.113	0.071	0.106	0.674	17.924	0.432
Participation frequency	0.043	0.757	0.583	0.041	0.261	33.901	0.412
Customer satisfaction							
Nationality	0.398	7.078	<0.001	0.285	0.998	35.976	0.004
Language	0.264	4.697	<0.001	0.209	0.970	29.545	0.025
Gender	0.198	3.527	0.006	0.165	0.902	45.322	<0.001
Membership type	0.161	2.869	0.019	0.139	0.822	38.854	0.005
Participation frequency	0.072	1.285	0.278	0.067	0.436	53.146	0.017

Customer satisfaction (CS)

A series of MANOVA tests were also conducted on culture groups (nationality group and language group) for the CS variable vector. Additional independent variables (e.g., gender, membership type, and participation frequency) were also attempted to identify the group differences on CS. The results revealed that there were significant main effects for nationality (*Roy's Largest Root*=0.398, F_{exact}=7.078, p<0.001), language (*Roy's Largest Root*=0.264, F_{exact}=4.697, p<0.001), gender (*Roy's Largest Root*=0.198, F_{exact}=3.527, p=0.006), and membership type (*Roy's Largest Root*=0.161, F_{exact}=2.869, p=0.019), but no significant main effect for participation frequency (See Table 4). Same as CE, either nationality group or language group, these two factors indicate that significant differences exist in customer satisfaction culture groups.

Post hoc analyses for the nationality group, language group, gender group, and membership type group for each of the CS constructs. Univariate tests for nationality group (See Table 5) showed that domestics scored significantly higher than internationals on facilities/services (M_{diff}=0.489, F=13.561, p<0.001), individual/psychological factor (M_{diff}=0.413, F=7.086, p=0.009), relaxation (M_{diff}=0.428, F=5.830, p=0.018), social factor (M_{diff}=0.932, F=18.959, p<0.001), and health/fitness (M_{diff}=0.673, F=22.066, p<0.001), respectively. For the language group, the results showed that first language participants scored significantly higher than non-first language participants on facilities/services (M_{diff}=0.480, F=13.821, p<0.001), individual/psychological factor (M_{diff}=0.329, F=4.618, p=0.034), relaxation (M_{diff}=0.406, F=5.499, p=0.021), social factor (M_{diff}=0.708, F=10.679, p=0.002), and health/fitness (M_{diff}=0.521, F=12.826, p=0.001), respectively; For gender group, the results showed that female participants scored significantly higher than male participants on individual/psychological factor (M_{diff}=0.622, F=14.981, p<0.001), relaxation (M_{diff}=0.555, F=8.681, p=0.004), and health/fitness (M_{diff}=0.452, F=7.522, p=0.007), respectively; For membership type group, the results showed that semester pass participants scored significantly higher than day pass participants on facilities/services (M_{diff}=0.413, F=5.299, p=0.024), individual/psychological factor (M_{diff}=0.519, F=6.584, p=0.012), relaxation (M_{diff}=0.702, F=9.604, p=0.003), and health/fitness (M_{diff}=0.700, F=13.059, p<0.001), respectively.

Discussion

In the past two decades, fitness program participation has expanded from developed countries (e.g., America and European countries) to other countries in the world, especially in Asian-pacific region [13, 14]. Some of the fitness industry's larger players (e.g., Fitness International LLC, CrossFit, and F45) have been developing their business in the global marketplace, which leads to strategical considerations to standardize their programs in order to fit participants' fitness needs and adjust the cultural diversity around the world. Though the studied population was from a selected university site, the participants were from the whole community and their ages ranged from 18 to 63 years, which can

Table 5: Univariate tests on CE constructs and CS constructs.

		Mean difference	Mean square	F	p-Value	Partial eta squared	Observed power
Communication effectiveness							
Nationality (domestic -international)	Anxiety Worry	−0.456	4.188	2.480	0.119	0.026	0.344
	OpenMind	0.191	0.731	1.364	0.246	0.014	0.212
	Reaction to strangers	0.462	4.303	10.804	0.001	0.104	0.902
	Uncertainty	0.589	6.982	14.152	<0.001	0.132	0.961
	Mindfulness	0.103	0.216	0.225	0.636	0.002	0.076
Language (first language-non_first language)	Anxiety Worry	−0.366	2.844	1.669	0.200	0.018	0.248
	OpenMind	0.185	0.730	1.362	0.246	0.014	0.211
	Reaction to strangers	0.456	4.410	11.106	0.001	0.107	0.910
	Uncertainty	0.556	6.560	13.175	<0.001	0.124	0.949
	Mindfulness	0.212	0.950	1.000	0.320	0.011	0.168
Customer satisfaction							
Nationality (domestic -international)	Facilities/Services	0.489	4.816	13.561	<0.001	0.127	0.954
	Individual/ Psychological	0.413	3.437	7.086	0.009	0.071	0.750
	Relaxation	0.428	3.707	5.830	0.018	0.059	0.666
	Social	0.932	17.497	18.959	<0.001	0.169	0.991
	Health/Fitness	0.673	9.114	22.066	<0.001	0.192	0.996
Language (first language-non_first language)	Facilities/Services	0.480	4.897	13.821	<0.001	0.129	0.957
	Individual/ Psychological	0.329	2.296	4.618	0.034	0.047	0.566
	Relaxation	0.406	3.508	5.499	0.021	0.056	0.641
	Social	0.708	10.642	10.679	0.002	0.103	0.899
	Health/Fitness	0.521	5.760	12.826	0.001	0.121	0.943
Gender (male -female)	Facilities/Services	−0.239	0.995	2.511	0.116	0.026	0.348
	Individual/ Psychological	−0.622	6.735	14.981	<0.001	0.139	0.969
	Relaxation	−0.555	5.365	8.681	0.004	0.085	0.830
	Social	−0.379	2.502	2.307	0.132	0.024	0.324
	Health/Fitness	−0.452	3.556	7.522	0.007	0.075	0.775
Membership type (DayPass – SemesterPass)	Facilities/Services	−0.413	2.040	5.299	0.024	0.054	0.625
	Individual/ Psychological	−0.519	3.209	6.584	0.012	0.066	0.719
	Relaxation	−0.702	5.882	9.604	0.003	0.094	0.866
	Social	−0.573	3.926	3.673	0.058	0.038	0.475
	Health/Fitness	−0.700	5.852	13.059	<0.001	0.123	0.947

homogeneously represent a broader population in similar settings such as the global universities and multicultural communities. The F45 program examined in this study is one of the worldwide standardized fitness programs utilized by many industry players every single day. The cultural diversity was investigated via whether fitness participant's nationality (international/domestic) or language (first language/non-first language) was the same with the trainers. It is noted that there is limitation that only one type of first language (English) was checked, English has been considered as a global communication language, which represents a major group of participants across the world. For those non-first language participants, they all can speak and understand English to some extent, which ensures the survey response bias. Above all, the generalizability of this study findings was confirmed.

The AUMT [22, 32] asserts that anxiety and uncertainty have direct effect on effectiveness of communication change [29]. Individuals can effectively communicate if they can well manage their anxiety levels and accurately predict others' attitudes and behaviors [17]. In a multicultural

setting, the results of this study indicated that culture was a significant variable on communication effectiveness between fitness participants and their trainers, where culture diversity in this content refers to the differences between domestics and internationals as well as between first language and non-first language participants, respectively.

The results revealed that, to achieve effective communication, domestics and/or the first language participants are more willing to manage their uncertainty between the minimum and maximum thresholds, which are within their control to sufficiently predict others' behavior and feel comfortable to interact with, eventually leading to higher communication effectiveness [28]. Moreover, communication effectiveness also requires an individual with the ability to manage their reaction to strangers [22]. In terms of reaction to strangers, domestics and/or the first language participants are also more willing to understand others' background, pay attention to others' culture and change their communication style in order to better interact with strangers, which enables them to adjust to new environment and potential culture differences [17]. The results of this study did not reveal such effects that internationals and/or non-first language participants had any difference with domestics and/or first language participants regarding their anxiety levels and to what extent they were open and able to predict others' attitudes or behaviors. Therefore, in a multicultural fitness setting, it requires fitness managers and trainers to pay additional attention to these internationals and/or non-first language participants to reach corresponding communication effectiveness comparing with domestics, especially on their uncertainty and reaction with strangers.

Gender differences in communication have been examined in many studies [33, 50]. It has shown that females and males possess different sociolinguistics subcultures which can affect the ways how they communicate and how they interpret their communication [33]. Previous studies showed that females often experience higher level of anxiety than males in both foreign language and native language communication settings [33, 50]. An individual's anxiety about communicating with strangers gradually decreases as time goes by [33]. However, this study did not show the gender differences of communication effectiveness. This finding differs from previous studies which may be due to the fact that culture diversity might weigh higher in such variation.

Regarding customer satisfaction, internationals and/or non-first language participants often have lower satisfaction comparing with domestic and/or the first language participants. The internationals and/or non-first language participants have lower satisfaction on facilities/services, individual/psychological factor, relaxation, social factor, and health/fitness. Therefore, in a multicultural fitness setting, it requires fitness managers and trainers to pay additional attention to these internationals and/or non-first language participants to reach corresponding customer satisfaction comparing with domestics, specifically on facilities/services, individual/psychological factor, relaxation, social factor, and health/fitness aspects.

Studies showed that customer satisfaction is often linked with customer loyalty and has significant impact on it [6, 9, 11, 41]. Fitness participants who purchase long term membership (semester pass) are often considered as having higher loyalty comparing with short term ones (day pass). In a multicultural setting, long term fitness participants showed higher customer satisfaction, specifically in facilities/services, individual/psychological factor, relaxation, health/fitness aspects (not in social factor), which will continue strengthening their loyalty to the fitness programs. Then their loyalty will in turn enhance their satisfaction to their fitness programs with continued participation and involvement.

Though no gender difference in communication effectiveness was found in multicultural fitness setting, male participants presented lower customer satisfaction, especially in individual/psychological factor, relaxation, and health/fitness (not in facilities/services or social factor). Therefore, in a multicultural fitness setting, it requires fitness managers and trainers to pay additional attention to these male participants to reach corresponding customer satisfaction comparing with females, specifically on individual/psychological factor, relaxation, and health/fitness aspects.

Cultural diversity has been examined mainly through nationality and language in this study. It is worth noting that culture is a complex social phenomenon with dynamic system of collectively constructed meaning that shapes cognition, behavior, and social organization, while diversity is about embracing the otherness of others. Therefore, the true understanding of cultural diversity demands critical reflexivity, systems thinking, and relational humility, which is an ongoing process of navigating complexity. In fact, cultural diversity denotes the coexistence of distinct cultural systems within a shared social space. From a objective aspect, it encompasses language, religion, customs, generations, etc.; from a subjective aspect, it includes values, beliefs, worldviews, and identities, etc. As cultures and languages are closely intertwined, it is not surprising that difficulties and confusions can occur among people with different cultural backgrounds [27–30]. For instance, even speaking same language (e.g., English) or from one nation, the circumstances that people have different levels of language accents and/or originally come from different regions may lead to considerable confusions and misunderstandings during their communications. In the context of multicultural fitness setting, though this study tried to capture the overall cultural diversity via nationality and

language two major aspects, the complexity of grouping issues still exits and cannot warrant cultural differences. Future studies may consider multi-dimensional approaches to access cultural diversity.

Conclusions

The findings of this study suggested that, in a multicultural setting, being highly aware of fitness participants' uncertainty and reaction to strangers can help fitness program managers and trainers improve their communication effectiveness with participants. With fitness participants' higher satisfaction with facilities/services, individual/psychological factor, relaxation, social factor, and health/fitness aspects, it would lead to continuation of the fitness participation with satisfaction.

As globalization continues and the cultural diversity extends to fitness settings, the ability to achieve effective communication and satisfy diverse fitness customers' needs has been a global challenge. The present study served as an attempt of the FCEES to explore communication effectiveness with fitness participants and their satisfaction in a multicultural setting. FCEES was composed of the revised multicultural *Communication Effectiveness Scale* [31] and fitness center *Customer Satisfaction Scale* [49] adopted for a multicultural fitness setting. This kind of research endeavor has a promising future and it could be more focused on broader diverse populations and other languages. Confirmatory Factor Analysis may be utilized to examine the structure of communication effectiveness model and customer satisfaction model. Structural Equation Modeling may be applied to investigate the detailed relationships between communication effectiveness and customer satisfaction regarding culture differences. Linkage variables between fitness participants and trainers may be added to study on the two-way communication effectiveness. Assessing cultural diversity requires mixed-method approaches to capture demographic, relational, and structural dimensions, etc. Additional quantitative and qualitative combined approaches, such as social network mapping, ethnography, and narrative analysis, may be considered to help group culture diversity in order to minimize the outcome biases of this study.

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Informed consent: Completion of the online survey acknowledged participation consent.

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