Does Bio-Demographic Diversity Influence Team Innovation through Participation Safety Climate and Team Reflexivity?

Maznah Abdullah, Mohammed Quaddus

Abstract—Bio-demographic diversity which refers to age and gender of members in a team, has been frequently identified to influence team innovation directly. As the theories expanded, bio-demographic diversity was suggested to influence team innovation via psychosocial trait and interaction process. This study examines those suggestions, in which psychosocial trait and interaction process were operationalized as 'participation safety climate' and 'team reflexivity' respectively. The role of team reflexivity as a mediator to participation safety climate and team innovation was also assessed. Due to a small number of teams involved in the study, data were analyzed by using a PLS-graph. While the results show only gender is significantly related to the participation safety climate, which in turn influences team reflexivity and team innovation, there is no statistical evidence that team reflexivity mediates the impact of participation safety climate on team innovation.

Keywords—Bio-demographic diversity, participation safety climate, team innovation, team reflexivity

I. INTRODUCTION

BIO-DEMOGRAPHIC diversity represents the characteristics of team-members which are immediately observable and categorized, such as age and gender [1]. Bio-demographic diversity is one of dimensions commonly studied to understand the composition of team. A team is said to be heterogeneous in bio-demographic background if a team is composed by team members with diverse ranges of age and gender, and vice-versa. Bio-demographic diversity was usually studied as team-level antecedent [2],[3] to team innovation [4-6] and team effectiveness [7-10]. Much of the researches have focused on its direct relationship with team performance [11],[12]. For example, age has been hypothesized to influence team innovation, because it signifies the knowledge and experience that gained by employees over time through their career progress [13]. Thus, age diversity is assumed to trigger varieties of knowledge and experience which improve the quality of decisions in team which enhance team innovation [14-16]. With regard to gender, there were mixes of findings. While [17] found that mixed-gender teams reported higher levels of creativity than the groups with single gender, some authentic studies reveal that single-gender teams were more efficient and accurate at solving multiple choice problems compared to gender-heterogeneous teams [18-20].

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Up to date, a direct relationship between bio-demographic diversity and team innovation is still being argued as inconclusive [1],[21-23]. Recently, [24] have highlighted that researchers should not be too preoccupied on detecting a direct relationship between antecedent factor and team innovation. Instead, they advocate researchers to demonstrate how and why those factors affect team innovation. In reality, team innovation does not result linearly from the antecedent factors [25]. Rather, literatures suggest that bio-demographic diversity could influence team innovation through 'psychosocial trait' and 'interaction process', which can be described by variables of 'team innovation climate' for the first and 'team reflexivity' for the latter — see [6],[26],[27],[28].

While bio-demographic diversity has been empirically examined to influence team innovation, literature suggests a relationship between bio-demographic and one of the team innovation climate dimensions i.e. participation safety climate, which in turn enhances team reflexivity. This notion has also been conceptually highlighted in a qualitative study by [29]. Based on the literatures, this study proposes and examines that bio-demographic diversity might influence team innovation by impacting participation safety climate, which in turn influences team reflexivity to cause team innovation. This study expects that bio-demographic diversity is related to the participation safety climate which describes a situation where team-members feel comfortable and non-threatened to be reflexive. When team-members are reflexive, it tells that they are actively involved in the discussion by reviewing their team's objectives, strategies, methods and working effectiveness, which then would result high team innovation. This study therefore tests the hypotheses that bio-demographic diversity is related to participation safety climate, which in turn determines the level of reflexivity in a team as a concomitant of team innovation. In addition to that, the theories postulating the mediating role of team reflexivity were also tested.

II. CONCEPTUAL THEORY

Innovation involves an initiation or discovery of an idea, technology, or process that is new to the organizational setting, which is then followed by the development and implementation of the idea [30-33]. To be regarded as innovation, an idea does not have to be completely unique or distinctive to others. It is simply, as long as it is new to a department [34]. An idea which is adopted from the outside of a department or an organization [32],[35] is also considered as an idea for innovation. The scope of innovation also covers a new small-scale idea which is developed or adopted to improve daily work processes and work designs [36].

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Generally, two key elements have been widely accepted to be included when defining innovation: (a) the generation of new idea which is literally known as creativity, and (b) the implementation of the idea [30],[37-41]. Creativity is a subcomponent of innovation which only refers to idea generation, whereby innovation refers to both elements i.e. creativity and implementation. However, the terms creativity and innovation are often used interchangeably in previous studies [42].

Fig. 1 below depicts a part of a heuristic framework by [6], which emphasizes that team outcomes were influenced directly and indirectly by team composition, through team psychosocial trait and interaction process. Psychosocial trait has been renamed by [28] as 'emergent states', and defined as a 'construct that characterizes properties of the team that are typically dynamic in nature and vary as a function of team context, inputs, processes, and outcomes' (pp.357). Generally, emergent states concern about the condition of a team which is likely to change according to the team's context. Team process was defined by [28] as 'members interdependent acts that convert team inputs to outcomes through cognitive, verbal, and behavioral activities directed toward organizing task work to achieve collective goals'(pp.357). Team processes describe team interactions which are necessary for team innovation [26],[28],[43]. They further explain that in an input-process-outcome (I-P-O) framework, team process is viewed as a mediating mechanism that link team composition and emergent state with team outcomes. Both of emergent state and team process are not impervious to team input [28].

These concepts have been supported and proposed by many scholars—for example, [24],[27],[43], to be applied in team innovation research. Furthermore, the theories of team effectiveness are applicable in team innovation research, as [6] highlighted that team innovation is one of the dimensions for team effectiveness. Specifically to diversity research, it has been asserted that variations in the demographic and social composition of teams affect group cohesion, processes and ultimately influence team innovation [44]. The need to understand how different dimensions of team diversity could affect group process and performance has also been emphasized [45].
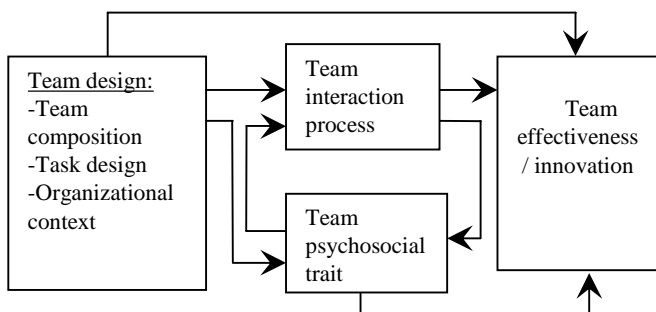

Fig. 1 The main part of heuristic model of team effectiveness (adapted from [6])

In a reflection on the above theories in team innovation research domain, team innovation climate has been suggested

by [46] as a variable to describe psychosocial trait/emergent state, whereas team interaction process could be explained by understanding team reflexivity variable [27].

Team innovation climate is a social psychosocial variable that explains the conditions in a team [46] that is related to innovation. The concept of team innovation climate has been generally defined as shared perceptions at a team level of the extent to which the conditions in the team support and facilitate innovation [47]. Team climate is said to explain team innovation directly [48],[49]. Numerous studies have demonstrated that work environment and social climates can foster or impede innovation and creativity at work [50-53]. [46] proposed a four-factor model of work group innovation climate – vision, participative safety, climate for excellence and support for innovation. The climate which is being considered in this study is 'participation safety'.

Participation safety climate describes a condition in team which is non-threatening and team members trust each other. [46] asserts that this climate is combination of two elements i.e. participation and safety. This climate describes a condition in a team which motivates team-members involvement in decision making within interpersonally non-threatening environment. Climate is important as it is one of the factors that motivate team members to bring in critical issues during the discussions [27],[54].

Team reflexivity is defined as 'the extent to which group members overtly reflect upon, and communicate about the group's objectives, strategies (e.g. decision-making) and processes (e.g. communication), and adapt them to current or anticipated circumstances' [55, pp.3]. Basically, it refers to the extent to which team members discuss task-related issues as well as their working effectiveness. Questioning, analysis, planning and learning are the main behaviors that embedded in team reflexivity [56]. It is a task process which describes the extent of interactions among team members in accomplishing their team's goal [57]. Discussions on task-related issues as well as team effectiveness are the interactions captured in a team reflexivity variable [58]. As an interaction process variable, it is expected to mediate the relationship between diversity and team outcomes [24],[28],[45].

III. HYPOTHESES

In correspond to the heuristic model by [6], this research hypothesizes that, bio-demographic has indirect impacts on team innovation through psychosocial and team interaction process. Thus, in the following, this research justifies how bio-demographic diversity might influence team innovation through psychosocial and interaction processes, which in this research are operationalized as 'team participation safety climate' for the former, and 'team reflexivity' for the latter. All the hypotheses were illustrated in Fig 2.

Firstly, bio-demographic diversity was suggested to be related to participation safety climate. This suggestion was based on the literature which says that bio-demographic variables will only enhance social behaviors among team members [59], but not directly toward team tasks.

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Bio-demographic homogeneity is positively observed to generate similar work attitude, but does not stimulate work-related communication among team members [60]. Similar attitude about work thus, is more advantageous for general social relationships because it improves social relations, trust, communications, and cohesiveness within the group [61],[62].

Since literatures apparently suggest that bio-demographic homogeneity is more contributing to a social relationship among team members, this research therefore suggests that bio-demographic homogeneity has a direct effect on team's participation safety climate, in which team members feel unthreatened and comfortable in team discussions. This suggestion is based on several relevant theories. For example, [63] highlights that employees usually comfortable to work with people who are similar to themselves [64], because they communicate with people of similar characteristics to them to form similar thoughts [44], thereby increasing communication effectiveness and team cohesion [1]. Similarly, theories in the social categorization [65], similarity-attraction paradigm [66] and homophile literature [67] emphasize that individuals who work with others who are similar to them will feel high sense of belonging, that strengthen their group identity. This research suggests that similar thoughts and high cohesion in homogeneous bio-demographic team will evolve to form participation safety climate which influences the likelihood of team members to feel comfortable and secured to participate in the discussion, even voicing out dissenting ideas. Thus, the first two hypotheses were developed as follows:

H1a: Age diversity is negatively related to team participation safety climate.
H1b: Gender diversity is negatively related to team participation safety climate.

Team participation safety is a dimension of team innovation climate which can be categorized as an emergent state that transmit the team-factor effects into team's interactions [28]. Since the outcomes of participation safety climate such as active participation, views sharing, ideas arguments, and open discussions are the components of team reflexivity, this research suggest that participation safety climate will in turn, influences team reflexivity. It is based on the fact that team reflexivity is more likely to happen in a team with environment which is harmless for team members to participate actively in the discussions. Similarly, [46] argued that participation safety climate encourages employee to be more participative in decision-making, which in turn stimulates team reflexivity that is characterized with interaction and communication among team members. Psychological safety climate is important for team reflexivity, as [68] assert that a climate with trust and social support characteristics stimulates task-related communication among team members. Without a safety climate, team members tend to act in habitual ways that hold back reflection, because they fear of threat and potential humiliation [54].

H2: Participation safety climate is positively related to the team reflexivity

Furthermore, team reflexivity has been regarded as a key process in team innovation [69-72], because it equips teams with the element of self-reflection and self-awareness which are important in finding better solutions to the problems they are facing. Past research shows that those groups that constantly review their thinking will find new ways of looking at situations and are more likely to be adept at problem solving [73],[74], which sparks new ideas generation and implementation. In a similar vein, team innovation is predicted as more likely to happen in a reflexive team, because reflexivity results a better communication and ideas sharing as team members constantly express their views on problems [75]. Furthermore, team participation safety climate has been postulated to influence team innovation directly. Therefore, another three hypotheses were developed as follows:

H3: Team reflexivity is positively related to team innovation.

While the relationships between participation safety climate and team reflexivity has been hypothesized in the above, this research suggests that the impact of participation safety climate on team innovation is mediated by team reflexivity. This is based on the theories which advocate that team-factors and psychosocial traits may influence team performance indirectly through interaction processes — see [6],[26],[27],[28]. Team reflexivity is one of team interaction processes which has been proposed as a variable that converts team's property and conditions into outcomes [28]. Similarly, a study by [58] found that team reflexivity is a variable between diversity and team performance.

Furthermore, there are evidences that demonstrate a relationship between the participation safety climate and team innovation directly. Team innovation was observed to increase when team-members perceive their work environment is safe for them to participate in decision making and voice their dissenting ideas openly [76],[77]. However, a study by [4] shows a weak relationship between participative safety climate and innovation. They justify that the weak finding might be due to avoidance of team members to argue and criticize each others' ideas in order to maintain the safety climate in their team thus. Their justification corresponds to [78] who highlights that intra-group safety hinder independent thinking which inhibits innovation. Thus, further hypothesis was developed as follow:

H4: Team reflexivity mediates the impact of team participation safety on team innovation.

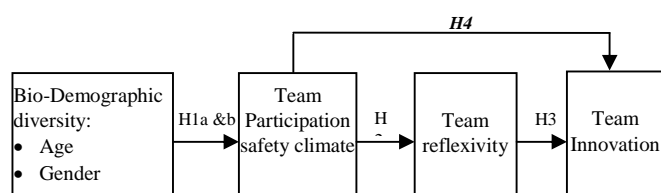All of the above hypotheses are illustrated in the Fig.2 below.

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Fig. 2 Hypothesized direct and indirect relationships in this study
Note: H4 is the hypothesis including the mediator (mediating hypothesis)

IV. METHOD

A. Sample and Procedure

The sample is comprised of 188 Innovative Creative Circle (ICC) in Malaysian organization. ICC was introduced based on the concept of Quality circle (QC), which is categorized as a parallel team by [6] or a problem solving team by [79]. As there is no database which lists out parallel teams in Malaysia, sampling frame is not available for this research. Thus, this research uses a convenient sampling to choose the research sample from the population of study. The samples were based on the list of parallel teams (ICC) that participated in the ICC National Convention organized by the Malaysia Productivity Corporation (MPC).

Initially, the MPC's list provides 178 ICCs from 89 organizations from 4 main economic sectors in Malaysia. Based on the contact information provided by the MPC, all the ICC coordinators from the 89 organizations were contacted via email for research invitation. Objectives of the research were made clear. Out of 89, only 43 organizations responded to the email and agree to participate in this research. To increase the number of teams from each organization, this research acts pro-actively. On top of the list of ICC that participated in the convention, each coordinator from 43 organizations was requested to suggest this research with few more ICCs from her/his organization that are reasonable to become respondents. Information such as team's name and total number of team members in each team was requested. Finally, complete information of 249 ICCs was obtained from only 33 organizations. Other 10 organizations did not provide the requested information, thus assumed to withdraw from this research.

The 249 packs of envelopes in which each of it contains questionnaires equivalent to the team size and one questionnaire for the team's departmental manager were prepared. To facilitate the distribution process, a team's name was labeled on each envelope. They were mailed to the ICC coordinators in quality department of each organization, who then distributed the packs of questionnaires to a leader of each ICC. All questionnaires were enclosed with a support letter from the MPC. Each team leader was provided with the guidelines of how to administer the questionnaire. The coordinators also were made clear about that, so that they know how the questionnaires should be coordinated which facilitates a follow-up process with every team.

Finally, a total of 229 team-based questionnaires were returned to the researchers, and keyed in into SPSS software.

However, only 188 team-based questionnaires were identified to be usable, which reflects a usable response rate of 75%. The other questionnaire sets from 51 teams were rejected because they were not returned together with the questionnaires from their departmental managers who justify their teams' innovations, thus totally incomplete and cannot be used for further analysis.

To determine the response rate sufficiency for this research which uses Partial-Least Square (PLS) as an analysis tool, this research follows suggestions of [80].

They suggest that sample size should be ten times of the two possibilities, whichever is greater: 1) measurement items in the most complex formative latent construct, or 2) the measurement items in the most complex dependent construct, with the largest number of independent constructs impacting it. Since this research does not have formative latent construct, possibility number 2 is applied: the most complex dependent construct is team reflexivity with six measurement items. Thus, the minimal response rate required is 6 times 10, which is equal to 60 teams. Therefore, the responses from 188 teams are sufficient enough for this research.

B. Construct Measurement

1. Bio-Demographic Diversity

Age and gender diversities were measured by using 'entropy index' which has been suggested by [81],[82],[83] to be used for categorical data.

2. Participation Safety Climate

Since we had access to the teams on the condition that the survey should be as short as possible, participation safety climate was measured by using four items [84] which were shortened from the Team Climate Inventory (TCI) by [85] to cater the needs of researchers to use fewer items in a survey. The items were: 'Members in this team have a 'we are in it together' attitude', 'Team members keep each other informed about work-related issues in the team', 'Team members feel understood and accepted by each other', 'Team members put real attempts to share information throughout the team'.

All items in this study were scaled from 1 (strongly disagree) to 6 (strongly agree). The six-point instead of seven-point Likert scale was used for all the statements in this research, to be pre-caution to the problem of 'not sure' or 'do not know' responses [86] which are apparent in Asian people [87]. Additionally, [88] suggest the middle alternative should be omitted in order to avoid central tendency.

3. Team Reflexivity

Team reflexivity was measured by 6 items by [70], a short version which was based on the original measurement by [69]. The shortened version was chosen due to the restriction by the MPC that requires questionnaire does not use too many questions which can possibly interrupt their customers' business operation. The last two items which were originally negatively worded were turned into positive. This is based on the fact that negatively worded items are confusing for respondents from East-Asia [89]. Furthermore, it has been reported to affect factor structures [90],[91] and weaken the reliability of scale [92],[93]. Examples of items are: 'My team

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often reviews its objectives', 'The methods used by my team to get the job done are often discussed', 'We regularly discuss whether the team is working effectively together', 'In this team, we modify our objectives in light of changing circumstances', 'My team strategies always changed', 'The way decisions are made in this team always altered'.

TABLE I
ITEM RELIABILITY

Latent construct	Measurement item	PLS loading
Team reflexivity (REFLX)	DaREFLX	0.9032
	DbREFLX	0.9030
	DcREFLX	0.9280
	DdREFLX	0.8923
	DeREFLX	0.7879
	DfREFLX	0.6877
Participation safety climate (PSAFE)	DaPSAFE	0.9396
	DbPSAFE	0.9312
	DcPSAFE	0.9303
	DdPSAFE	0.9402
Team Innovation (INN)	AaINN	0.8924
	AbINN	0.8924
	AcINN	0.9133
	AdINN	0.9182
	AeINN	0.9078
	AgINN	0.8440
	AfINN	0.8827

4. Team Innovation

In measuring team innovation, there is a need to consider both elements of idea generation and idea implementation [26],[94], as well as a quality of the innovation [47],[95]. The first three items were adapted from [47],[76] that cover ideas generation and implementation elements. The items are: 'This team generates many new ideas, methods, or procedures to improve work-related problems in this department', 'This team always consider new and alternative methods and procedures to improve work-related problems in this department', and 'This team implements new ideas that improve work-related problems in this department'.

Whereas for the quality of innovation, four items have been adapted from [47] that cover four aspects: magnitude, radicalness, novelty and benefits. Magnitude describes departmental managers' perception on how great the positive consequences resulted from the innovation made by a team. Radicalness explains the impact of the innovation on the present situation. Novelty tells to what extent the innovation is new to the department, and finally benefit describes how much the innovation has been beneficial to the department. The items are: 'This team implements new ideas that have positive consequences for this department', 'This team implements new ideas that change the present situation', 'This team generates very unique ideas', and 'This team implements changes that benefit this department'.

C. Data Aggregation

Since the unit of analysis for this research is at a team level, individual Likert-data for team participation safety climate and team reflexivity in each team were aggregated to get a

response value at a team level. The Likert-scale data which were responded by departmental managers to measure team innovation does not involve in this process, because they are measured based on the responses from only one manager of each team. Please note that, the age and gender data were also not aggregated because the diversity of each team was computed based on the compilation concept, not aggregation [96].

Before the mentioned data were aggregated, the data should display a sufficient agreement among team members [97],[98]. This agreement was checked through the $R^*wg_{(j)}$ index for multiple items [99].

$R^*wg_{(j)}$ is the index of within-group agreement for multiple items [99]. $R^*wg_{(j)}$ is calculated by comparing the observed variance on a set of items in a group to the variance that would be expected if the group members would respond randomly. $R^*wg_{(j)}$ is sufficient to represent satisfactory agreement if the average value is .70 or higher [99],[100]. The $R^*wg_{(j)}$ index was computed in the SPSS syntax, guided by the syntax code formulation by [101]. The average of agreement indexes of each team for the participation safety climate and team reflexivity respectively show 0.7810 and 0.7637, which are above than the required cut point.

V. DATA ANALYSIS AND FINDINGS

Since the sample size for this study is only 188 teams which are considerably small for the analysis through covariance-based Structural Equation modeling (SEM), the Partial-Least-Square approach was used. Data were analyzed by using the PLS-Graph software, following the two-stage process as detailed by [80],[102],[103]. The first stage is the measurement model assessment, which focuses on the examination of item reliability, convergent validity and discriminant validity on the indicators used to measure the latent constructs. The second stage is the measurement of structural model, which focuses on the hypotheses testing by examining the path coefficient (B), statistical significance of t-values and mediating test analysis.

A. Assessment of the Measurement Model

1. Item Reliability

Table I below presents results on the reliability of every item used for latent constructs in this study. Item reliability loading value indicates how well each measurement item is related to their corresponding construct. Based on [104],[105],[106], items that loaded below 0.6 were considered enough to explain the reliability. The lowest loading value in the table I is 0.6877, thus all the items load sufficient value for each construct.

2. Convergent Validity

Convergent validity is evaluated based on internal consistency and average variance extracted (AVE). Internal consistency reflects the reliability of a construct [80],[104]. [105],[107] explained that 0.7 indicates acceptable value for internal consistency, whereas for average variance extracted, a minimum of 0.50 is sufficient [104]. Table II shows the results of internal consistency and AVE generated from the PLS for

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the all latent constructs in this research. All internal consistency and AVE values were higher than 0.70 and 0.50 respectively; thus meet the requirement.

3. Discriminant Validity

Discriminant validity assesses the degree of each construct differs from the others [80]. This is to ensure that the measurement items of the constructs did not share variances with measurement items of other constructs more than their corresponding constructs. To examine the discriminant validity, cross-loadings were executed at construct and item level.

At the construct level, discriminant validity was examined by comparing the square root of the AVE to the correlation between constructs. Discriminant validity is fulfilled if the square root of the AVE is larger than the correlation between constructs [80]. The item can be discarded from the model if it does not conform to this requirement. For cross loading at the construct level, all the AVEs which are in bold in table III were shown to be higher than between-construct correlation values; thus all the constructs are different from others.

At the item level, the cross loading matrix of items within a construct (shown in columns) should be greater than the loading of any other item within the same column [80],[108]. In table IV, there are two items relatively load lesser cross loading values than their corresponding values in their construct column. These items are DeREFLX, and DfREFLX. Thus, these two items were discarded from further analysis, and the item-level cross loading was run again without those two items. Table V displays the 2nd run cross-loading values and were observed to cross-load into their respective constructs distinctively. Therefore, the item-level discriminant validity is passed without those two items.

B. Assessment of the Structural Model (Hypotheses Testing)

Hypotheses 1(a & b) through 3 predict direct relationships, whereas hypothesis 4 predicts mediating relationship. Hypotheses 1 through 3 were tested based on the results presented in the table VI below. All direct hypotheses were supported except for the 1a and 1b. Hypothesis 1a demonstrates a negative relationship as it was anticipated, but the t-value was low for the relationship to be considered as significant. The hypothesis 1b which anticipates for a negative relationship between gender diversity and participation safety climate was not supported, because the t-value for the relationship shows a significant relationship but in a contrary direction to its hypothesis. Instead of a negative relationship as hypothesized, the statistic shows a significant positive relationship.

Hypothesis 4 requires an examination of the mediating role of team reflexivity in the relationship between participation safety climate and team innovation. To examine this, three steps by [109] were followed. The results were summarised in table VII and illustrated in Fig.3 below.

TABLE II
CONVERGENT VALIDITY

Latent construct	Internal Consistency	AVE
Team Innovation (INN)	0.965	0.798
Participation safety climate (PSAFE)	0.965	0.875
Team reflexivity (REFLX)	0.941	0.730

TABLE III
CONSTRUCT-LEVEL CROSS LOADING

	Participation safety climate	Team Reflexivity	Team innovation
Participation safety climate	**0.935**		
Reflexivity	0.8587	**0.931**	
Team innovation	0.3666	0.3633	**0.893**

TABLE IV
ITEM-LEVEL CROSS LOADING (1ST RUN)

	Participation safety climate	Team Reflexivity	Team innovation
DaPSAFE	0.9396	0.7959	0.3322
DbPSAFE	0.9317	0.8062	0.3399
DcPSAFE	0.9298	0.7677	0.3196
DdPSAFE	0.9401	0.8398	0.3770
DaREFLX	0.7958	0.9033	0.3456
DbREFLX	0.7904	0.9030	0.3221
DcREFLX	0.8287	0.9281	0.3642
DdREFLX	0.7794	0.8924	0.3185
DeREFLX	0.5905	0.7879	0.2557
DfREFLX	0.4690	0.6876	0.1967
AaINN	0.3594	0.3655	0.8979
AbINN	0.3169	0.3239	0.8942
AcINN	0.3130	0.2989	0.9110
AdINN	0.3272	0.3182	0.9173
AeINN	0.3340	0.3186	0.9063
AfINN	0.3199	0.3390	0.8451
AgINN	0.3139	0.2946	0.8782

TABLE V
ITEM-LEVEL CROSS LOADING (2ND RUN)

	Participation safety climate	Team Reflexivity	Team innovation
DaPSAFE	**0.9396**	0.7959	0.3322
DbPSAFE	**0.9316**	0.8062	0.3399
DcPSAFE	**0.9298**	0.7677	0.3196
DdPSAFE	**0.9401**	0.8397	0.3770
DaREFLX	0.7958	**0.9367**	0.3456
DbREFLX	0.7904	**0.9388**	0.3221
DcREFLX	0.8286	**0.9474**	0.3642
DdREFLX	0.7794	**0.8975**	0.3185
AaINN	0.3594	0.3655	**0.8978**
AbINN	0.3168	0.3239	**0.8942**
AcINN	0.3130	0.2989	**0.9110**
AdINN	0.3272	0.3182	**0.9173**
AeINN	0.3340	0.3186	**0.9063**
AfINN	0.3199	0.3390	**0.8451**
AgINN	0.3139	0.2946	**0.8782**

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Firstly, a relationship between the antecedents and mediator should be demonstrated, which has been tested in hypothesis H2 as significant (β=.85, p<.01). In step 2, a relationship between the antecedent (participation safety climate) and the consequence (team innovation) was tested without the presence of team reflexivity, and found as significant (β=.36, p<.01). In step 3, the mediation effect of the team reflexivity was demonstrated by regressing the relationship between participation safety climate and team innovation with the presence of team reflexivity variable. When the team reflexivity variable was added into the equation, the beta value and the significance level for the main relationship between participation safety climate and team innovation, declined from .36 (p<.01) to .21 (p<.05). Additionally, a direct relationship for team reflexivity and team innovation became non-significant ((β=.183, p<.01). The non-significance in step 3 between the mediator and team innovation indicates that team reflexivity does not mediate the effect of participation safety on team innovation.

TABLE VI
T-VALUE FOR DIRECT HYPOTHESES

Hypothesis	Path coefficient	t-value	Result
1a: Age diversity → PSAFE	-0.0710	0.8993	Not supported
1b: Gender diversity → PSAFE	0.1350	1.6949 *	Not supported
2: PSAFE → REFLX	0.8590	37.6943 ***	Supported
3: REFLX → INN	0.3630	5.8175 ***	Supported

One-tailed: *p<0.05,**p<0. 025, ***p<0.01
PSAFE: participation safety climate, REFLX: team reflexivity, INN: team innovation

TABLE VII
THREE STEPS MEDIATING TEST RESULT

	Step1	Step2	Step3
	Team Reflexivity	Team innovation	Team innovation
Participation safety climate	0.8590 (37.6943) ***	0.3670 (5.1220) ***	0.2100 (1.7022) *
Team reflexivity	-	-	0.1830 (1.5587) ns

One-tailed: *p<0.05, **p<0. 025, ***p<0.01
ns: Not significant
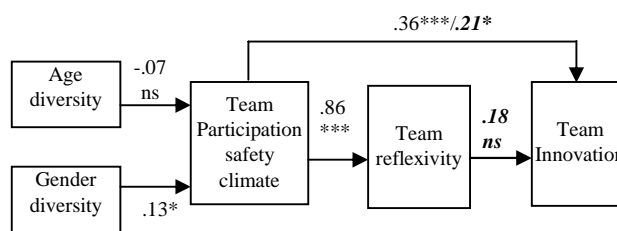Value in bracket is the t-value.

Fig. 3 Findings illustration
Note: Number above the arrows represent standardized coefficient (betas). Betas in bold and italic are based on the results including the connecting mediator.

VI. DISCUSSIONS

This research examines how bio-demographic diversity may influence team innovation through its relation with psychosocial trait and interaction process: in this research, psychosocial trait and interaction process were operationalized as 'team participation safety climate' for the former, and 'team reflexivity' for the latter. Firstly, this research examines a direct relationship between bio-demographic variables (age and gender diversity), participation safety climate, team reflexivity and team innovation in direct sequences. Finally, examination was furthered to investigate if team reflexivity mediates the effect of participation safety climate on team innovation.

For direct hypotheses, not all hypotheses were supported. In the test for direct hypotheses 1a, age diversity shows a negative relationship as it was hypothesized with participation safety climate, however not statistically significant to be considered valid. The negative direction of the relationship indicates that the more similar the age of team members, the better will be the safety climate in a team. However, results show that the non-threatening climate for active participation among members in team was not significantly influenced by the age homogeneity among team members. Even though this finding does not correspond to the hypothetical literature, to somewhat, it corresponds to a qualitative study by [29] which reported that respondents did not give strong responses when asked about how age diversity contributes to team innovation.

For the hypothesis 1b, a test for a relationship between gender diversity and participation safety climate was not supported, because the t-value for the relationship shows a significant relationship but in a contrary direction to its hypothesis. Instead of a negative relationship as hypothesized, the path coefficient value shows a positive. It indicates that the more diverse the gender of team members in a team, the higher will be the participation safety climate. The results suggest that the participation safety climate will increase as the gender diversity does.

The reason for a positive relationship between gender diversity and participation safety in this study could possibly due to the large percentage of teams which were dominated by male team members that involved in this study: 90 percent were male and only 10 percent were female. Most of the teams were male-dominated. Consequently, the results indicate that a team mixed with female team members has better

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participation safety climate, compared to a team with all male. Based on several theories, this notion is sensible if male behaviors were considered. For example, [110] states that men are usually competition-oriented and aggressive [111-114], even at a very young age [115],[116]. On top of that, men were less cooperative [117],[118] like to argue particularly with their same gender type [119] and prone to involve in hypercompetitive situations [115]. If a team were participated by only men, a team climate might become too much competitive and uncooperative, which will certainly make team members do not feel comfortable, free and unthreatened to voice out or argue ideas. Thus, a team mixed with female team members could result better participation safety climate, because women's behavior might bring a balancing effect on the uncooperative and high competition climate in team. This is because women behaviors are different to men. Women were literary mentioned to have more tendencies in maintaining relationships [110] and less aggressive [111-114]. Furthermore, most research [117],[118] found that women are usually display more cooperative behavior than men and do not favor too much competitive situations [115]. Women's cooperative behavior is reflected in their open communication, where they listen better than men in conversations [120],[121] and willing to give other speakers to dominate the conversation [122].

The hypotheses 2 and 3 which anticipate direct relationships between participation safety climate and team reflexivity, as well as team reflexivity and team innovation were supported. The results propose that participation safety climate in team will enhance team members' reflexivity, and therefore roots for team innovation. Even though the results show a significant relationship between participation safety climate, team reflexivity and team innovation, there was no statistical evidence to show that team reflexivity mediates the safety climate impact on team innovation. It indicates that participation safety climate in a team could directly influence team innovation.

This research therefore concludes that, only gender diversity could strongly influence participation safety climate, which in turn might cause team reflexivity and team innovation in sequence. While gender diversity is imperative for the participation safe climate in a team, but the safe climate does not ensure high team reflexivity to happen. Specifically, the safety climate alone was strong enough to influence team innovation.

Therefore, based on the above discussions, two main implications for the parallel team manager were highlighted in this paragraph. Firstly, gender mix of team members would influence team participation safety climate, which is important to enhance team reflexivity and sequentially cause high team innovation. Despite of many literatures that suggest gender homogeneity for better social relationships among team members, it should be highlighted that too high composition of male would lessen participation safety climate in a team. Thus, by mixing male with female members in a team could enhance the climate. Secondly, even though participation safety climate in a team might not cause team innovation

through team reflexivity, there is statistical evidence that participation safety climate is directly related to team reflexivity. On the whole, an effort to make sure that optimum participation safety climate to evolve in a team is necessary as it would increase the possibility of team reflexivity and in turn cause high team innovation in turn.

This research however has limitations, where the variables of team participation safety climate and team reflexivity were measured by using a short version due to the request from the participating organizations that the questionnaires should not be so lengthy, which could interrupt their employees' working hour. Therefore, it is recommended the future research to use full version questionnaires, which could measure the two variables more accurately, thus influence the results for mediating role of team reflexivity. Since this research did not find a significant relationship between age diversity and participation safety climate, it is suggested that future study to explore, to which psychosocial trait that age diversity could be related with.

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