Dimensions of social barriers to effective collaborative working in construction supply chain

Titus Ebenezer Kwofie*, Clinton Ohis Aigbavboa and Zanele Sally-Sue Matsane

Sustainable Human Settlement and Construction Research Centre, Faculty of Engineering and the Built Environment, University of Johannesburg, South Africa
Email: teeagk@yahoo.co.uk
Email: caigbavboa@uj.ac.za
Email: zmatsane@cut.ac.za
*Corresponding author

Abstract: Collaborative working (CW) has emerged as a key innovative procurement concept adapted to construction projects in an effort to improving performance, ameliorating the fragmentation and adversarial nature associated with traditional models in project delivery. In spite of the concept gaining increasing acceptance in the global construction industry, several studies have highlighted social barriers that hinder effective CW in construction supply chain. However, growing interest in improving effective CW in construction has not been matched by empirical knowledge that captures the understanding of the social behaviours behind the social barriers. Using an exploratory research design on three case studies, this study revealed personal cognitive domain, behavioural and environmental factors as the dimensions of social barriers to CW in construction supply chain. By understanding these dimensions, stakeholders and practitioners can better evolve approaches tailored at improving the social environment of CW in construction supply chains.

Keywords: construction supply chain; collaborative working; CW; social barriers.


Biographical notes: Titus Ebenezer Kwofie is a Postdoctoral Research Fellow (PDRF) at the University of Johannesburg, South Africa. He is a Lecturer at the Department of Architecture, Kwame Nkrumah University of Science and Technology in Kumasi, Ghana. He is an Architect by profession and holds a PhD in Construction Management with research interest in housing, managerial efficiency and project communication effectiveness.

Clinton Ohis Aigbavboa is a Professor in the Construction Management and Head of Sustainable Human Settlement and Construction Research Centre, Faculty of Engineering and the Built Environment, University of Johannesburg, South Africa. He publishes on construction procurement, housing and sustainable development. He is currently the Vice Dean of the Faculty of Engineering and the Built Environment at University of Johannesburg, South Africa.

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1 Introduction

Improving the fragmentation, socio-cultural environment, economic viability and performance of the construction sector has emerged as an important factor towards ensuring effective collaborative working (CW) in construction businesses and project delivery. Effective CW is essential to the success of project delivery and well as the performance of construction businesses within the supply chain (Tamburro and Wood, 2014; Chan et al., 2010; Davis and Walker, 2009; Song et al., 2009; Xu et al., 2005; Xue et al., 2005). Even though CW has gained enough acceptance and increasing popularity in construction supply chain (SC), it has become evident to stakeholders and practitioners of the many varied barriers the CW concept faces within construction arena. Barriers as used here refers to the varied hindrances and challenges to the effectiveness of CW in SC that may take either managerial, organisational, financial, social, technological, individual and cultural forms (Khurana et al., 2011; Cicmil and Marshall, 2005; Fawcett et al., 2008). In the wake of the notable challenges and barriers to the concept, Shelbourn et al. (2007, 2012) intimated that the industry is still constantly developing innovative means to ensure implementation of CW in the sector. However, Erdogan et al. (2012) and Eriksson (2010) highlighted the fact that, technical issues are not the main hindrances to CW but also social barriers which are embedded in the social behavioural dimension of people and organisational factors posing significant hindrances and challenges to effective CW in construction businesses and project delivery. The social behavioural dimension refers to the observable actions, attitudes, perceptions and cognitive intent behaviours that originate from the social environment of persons or organisation (Wilson and Chatterton, 2011).

This notwithstanding, Senescu and Haymaker (2009) have suggested that, the improvement in CW and practices can bring tremendous improvement to the architectural, engineering and construction sector as well as to businesses directly related to construction processes. However, given the social behavioural nature of construction process, tasks, formal and informal relationships and performance, it can be argued that a clear knowledge and understanding of the social dimensions behind the barriers that militate against effective collaboration is critical towards actions and intervention likely to trigger these perceived improvements. Even though, the social barriers to effective CW and practices in the construction industry is well acknowledged (Cicmil and Marshall, 2005; Erdogan et al., 2012; Khurana et al., 2011; Eriksson, 2010; Fawcett et al., 2008), understanding the social dimensions behind these barriers is yet to be acknowledged and measured empirically. The significance of such a measure is embedded in the theoretical assertion that, by understanding the nature of behaviours and dynamics behind social barriers, a more pragmatic approaches and interventions can be adopted to engender improvement in effective collaboration in the sector. Social barriers here refers to barriers
that are created by the culture, communal orientation through persons’ or people’s behaviour or influence of environmental factor (Knunara et al., 2011; Fawcett et al., 2008; Kelly, 2011; Cicmil and Marshall, 2005).

The construction industry globally, has been noted as a key social and economic activity sector which is highly dependent of effective collaboration to achieve its goals but facing varying degrees of social barriers (Pala et al., 2012; Love et al., 2010; Davis and Walker, 2009; Rahman and Kumaraswamy, 2008; Xue et al., 2007). However, the understanding of the social dimensions of barriers to effective CW and practices in lacking, this study has sought to fill this knowledge gap by exploring the social dimensions of the barriers to effective collaboration in construction businesses and project delivery. The relevance of this study is that, the knowledge generated will be significant in influencing current stage of play in the social dimension of the barriers to effective CW towards improving relationship, performance, team and managerial effectiveness. This benefit is premised on the fact that, with the evidence of emerging changes in many facets of construction businesses, project delivery and organisations, relationships among collaborative parties in the delivery of construction projects have consequently become more critical for the success of the project (Pala et al., 2012).

2 Literature: the social cognitive theory

The social cognitive theory has been one that has extensively been employed to explain human psychosocial functioning in social behaviours (Wood and Bandura, 1989; Bandura, 2001; Stajkovic and Luthans, 2003; Pajares et al., 2009). However, human social behaviour is traditionally depicted as being shaped and controlled either by environmental influences or by internal dispositions (Wood and Bandura, 1989; Bandura, 2001). The social cognitive theory posits that, human functioning derives from the causal relationship between psychological factors, behaviours and situational (environmental) factors and these operate as interacting determinants that influence each other bidirectionally (Wood and Bandura, 1989; Pajares et al., 2009; Stajkovic and Luthans, 2003). However, this causal interactions in the theory has been simplified to denote cognitive factors, personal factors, and the external environment as depicted in Figure 1.

In this causal structure depicted in Figure 1, behaviour, personal factors and external environmental events operate as interacting determinants that influence each other bidirectionally. However, Wood and Bandura (1989) stressed that the degree of causal influence of the three factors is not in any way equal in direction and not simultaneous. From a reflection of the above assertion, it is argued that social situations which emerge or evolve often as a person’s behaviour is a function of the situation that is borne out of a function of a person or cognitive factors of behavioural dispositions (Bandura, 2002). In this regard, it is asserted that, in social psychology, the behaviour intentions and any social context, is one of the critical factors that determine behaviour actions and outcome (Wood and Bandura, 1989). The person in here refers to the self-regulated factors that are under the cognitive control and this forms their behaviour in a situation (Bandura, 2001). Likewise, it is said that, persons self-regulate their behaviour by relying on cognitive support and manage relevant environmental cues and factors (Cooper, 2000; Bandura, 2001). Drawing on this, the assertion is that, personal factors relate to perceptions and attitudes towards CW goals, orientations and dimensions. The Behaviour here refers to
day-to-day function, task and goal-directed behaviour in respect of the dimension of the CW whereas the environmental factors relate to organisational systems, subsystems and processes that exist to support and have direct or indirect impact on the function, task and goal-directed behaviour outside one’s personal cognition and behavioural disposition in the CW or practices. It should be acknowledged that environment is a broad concept which can encompass, social, cultural, political, economic, physical and psycho-social (Cooper, 2000). In the context of this study, it must be noted that, the focus of the environmental factors as posted by the social cognitive theory was on the social dimension of environment.

**Figure 1** Schematisation of the relations among behaviour, cognitive and other personal factors and the external environment

From this fact above and drawing from the construction environment and the behavioural nature of CW, ensuring effective collaboration outcomes in construction SC heavily rely on understanding and overcoming the dimensions of social barriers. Erdogan et al. (2012) revealed that, social barriers are high among the notable challenges affecting effective collaboration in construction SC and these are perceived to be borne out of persons’ behavioural dispositions or environmental influences or both.

Khurana et al. (2011) revealed that one major challenge to effective collaboration in SC was barriers to information sharing. In this, Khurana et al. (2011) identified individual or group barriers and socio-cultural barriers among the key barriers inhibiting information sharing in CW and practices. The socio-cultural and individual or group barriers originate from behaviour and actions borne out of personal or group behavioural dispositions and environmental factors (Khurana et al., 2011). Spekman et al. (2002) revealed that shared culture, improved relational interactions, trust are secured behavioural and personal factors that when improved will overcome social barriers in collaborative SCs. Skjoett-Larsen et al. (2003) and Lejeune and Yakova (2005) all identified confidence, trust and mutual interdependence as central effective collaborative SC. It can be suggested that, all these factors are embedded in the personal, behavioural and environmental domain of the social cognitive theory. However, other studies have revealed technical, organisational, financial and managerial barriers as others that affects effective collaboration in construction SC (Kohli and Jensen, 2010; Pala et al., 2012). However, it has been revealed that Social factors such as interdependence, intensity, and trust are significant elements in effective collaboration and are consequential in maintaining relationships (Cassivi, 2006; Sheu et al., 2006). Against this, Sheu et al. (2006) empirically attested that, lack of sound social factors embedded in the behavioural dimensions of CW and practices have negative impact on relationships and implementation of technical factors in a SC.
This study focuses on the dimensions of the social behavioural barriers inherent in CW and practices in construction project delivery and businesses.

2.1 CW and human and business environment

CW and practices have typically been perceived not to be tightly non-traditional procurement structure and thus have a high propensity to thrive in more open and less class oriented cultures, behaviours and business environment (Kelly, 2011; Mignot, 2012). CW and practices are perceived as the precursor for ameliorating the fragmentation and adversarial nature of the construction environment and across the various project life cycle (Xu et al., 2005; Xue et al., 2005, 2010). Xue et al. (2010) defined CW and practices as an act of working jointly together of project stakeholders, participants and different organisations for the efficient and effective actualisation of project goals and product outcome. To this end, Xue et al. (2010) further intimated that, the development of CW and practices as an emerging non-traditional procurement are from a working relationship and delivery systems viewpoints. The context of this, it is argued that business environment factors and human behaviours are the two critical areas that affect effective and efficient CW and practices in construction projects delivery and business (Xue et al., 2010, 2005; Cicmil and Marshall 2005; Xu et al., 2005).

Against this, it is evident from plethora of literature that, the construction project business environment is typically characterised by adversarial relationships, fragmented operation processes, a lack of genuine cooperation over time, and complexity (Cicmil and Marshall, 2005). Thus, changes and improvement in business culture, behavioural orientations, attitudes and strategies are key to improving this seemingly obvious situation (Xu et al., 2005; Xue et al., 2010). Likewise, attitudes and behaviours factors of related individuals and groups involved in project environment such as trust, incentives, conflicts, mutual respect, tensions, etc. have increasingly been cited as being very influential barriers to effective CW and practices in construction SC (Wong et al., 2005; Diallo and Thuillier 2005; Leung et al., 2004; Phua and Rowlinson, 2003). From a reflective mood and critical appraisal of extant literature, it can be asserted that, to ensure an improvement in the business environment in construction collaborative practices, it is important to rigorously pursue the understanding of the social dimensions underlining the behaviours that are embedded in the social barriers of the construction business environment and CW and practices.

2.2 Postulating the dimensions of social barriers to effective CW

Increasingly, though studies into social barriers in construction CW has been determine to be very relevant and gained interest among researchers (see Phua and Rowlinson, 2003; Cheung et al., 2003; Leung et al., 2004), it is well noted that, an inquiry into the dimensions of social barriers is almost non-existent. Notable studies seem to posit that the social barriers to effective CW and practices in construction businesses and project delivery are embedded in the behavioural domain (Cheung et al., 2003; Leung et al., 2004). However, it can be contended that, the dimensions of the social barriers to effective CW and practices in construction project delivery is more than just the behavioural dimensions. Cooper (2000) argued that, social actions are often influenced by the cognitive intentions and the environmental context (Cooper, 2000). Likewise, it
can be said that, social barriers lie in the social cognitive domain which are exhibited or typified in the personal, behavioural actions and the environmental influence (Cooper, 2000; Pajares et al., 2009; Stajkovic and Luthans, 2003). This is because by drawing on the social cognitive theory, the personal, behavioural and environmental factors offer a bidirectional triadic relationships meaning that an action can be either of the three, two or all in a given context. Hence this study postulates that, the dimensions of social barriers to collaborative practices may exist from the personal, behavioural and environmental domain as posited by the social cognitive theory.

3 Study methodology

It is well acknowledged that studies into behavioural disposition that are socially oriented are very dynamic and often evolving exerting difficulty in its prediction, identification and on large-scale. Hence, many studies exploring behavioural dispositions in acknowledging this have traditionally adopted an exploratory approach using case study(ies) (see Ward, 1993; Westwood, 1993; Briscoe et al., 2001; Gorse and Emmitt, 2005; Fawcett et al., 2008; Cicmil and Marshall, 2005). Hence, in ensuring theoretical validity, the research design adopted was mainly qualitative approach involving a semi-structure questionnaire interview as this kind of inquiry is well noted for its appropriateness in exploring contents and themes by studying a phenomenon or problem in-depth on a smaller scale (Yin, 2013; Creswell, 2009; Fellows and Liu, 2008). The study adopted three cases of major projects using CW as the main procurement and SC in three major states (Gauteng, Free State and Mpumalanga) in South Africa. The three cases were a hospital project, social housing project and university project. Electing to use the case study approach stems from the fact that, the projects adopted CW as the main procurement route which is the focus of this study and by so doing, it allows for gaining particular understandings or insights into contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident (Creswell, 2009; Yin, 2013; Fellows and Liu, 2008). The collection of the primary data consisted of the use of interviews structured around the three main factors of the social cognitive theory as the main themes (personal, behaviour and environment) (Klenke, 2015). By so doing, the structured questionnaires for the interviews sought to identify the dimensions of social barriers experienced in the CW on the three case projects adopted that are due to personal, behaviour and environment (context) of the project and the project team.

The primary data from the interview was analysed using content analysis which included transcribing and coding the interviews thereby establishing the basis for the content of the three main dimensions (i.e., under personal, behaviour and environment themes), interpretation and representation (Taylor-Powell and Renner, 2003; Creswell, 2009). A total of 25 experienced persons were interviewed across all three project case studies from the three states. By following the main domains of the social cognitive theory, the interviews were conducted by respondents drawing on their experience in CW to highlight the social barriers they encounter in their projects there were involved that were due to their own personal factors or orientations, behavioural factors and those that occur as a results of the influence of their working or organisational environment. The interview was conducted from 12th September to 25th October, 2016 with each respondent spending averagely, 20 minutes. The interview started from Gauteng in
September and ended in Mpumalanga State on October, 25th, 2016. The interviews were conducted during working hours on the respective construction site of the three selected case study projects. To aid the analysis of the qualitative data gathered from the interview, the five main steps suggested by which included transcribing of the audio interviews, organising and preparing the transcripts, iterative re-reading of the transcripts, coding of the transcripts and generating themes was used as a guide. In this study, the coding was manually done by colour coding largely because the volume of data from the 25 transcripts was considered manageable (Creswell, 2009). Creswell (2009) recommended that, where theory or prior formulation is being examined in a study, a preliminary qualitative codebook should be adopted for coding the data following the prior determined themes of the theory. Hence, the study followed this approach focusing on the three main themes prior identified. By following a systematic iterative re-reading and coding of the transcripts, a profound understanding of each interviewee’s viewpoint was attained allowing for the extraction of issues and generation of the emergent patterns relating to the themes of personal, behavioural and environmental factors across the three selected cases studies. The emerging facts under the themes were further categorised into primary themes supported by participant quotations. The interview protocol has been added as Appendix.

4 Results and findings

4.1 Background information of respondents

Table 1 presents the summary of the typology of respondents interviewed as well as their average years of experience. It is clear to note that the average years of experience of the various categories of respondents were above ten years except for Construction manager which was eight years. Even with an average years of experience of eight years can be considered as reasonably good and acceptable for a senior managerial role in CW. Likewise, for most respondents being above averagely ten years of experience could suggest that, they have reasonably adequate experience to contribute to the study and thus likely to offer credible and acceptable responses. Also from the cluster of projects under consideration in the three cases (Hospital, university and social housing), it could be asserted that, by drawing on their experiences, the findings are more likely to come from a cluster of project typologies that are more likely to be a fair representation of reality in CW in the industry.

4.2 Results of the dimensions of social barriers in CW

The empirical material captured (through content analysis) a number of instances which were evidence of the three dimensions of social barriers to CW and practices. Overwhelmingly, behavioural dimensions were dominating in terms of counts. This results is presented in Table 2. From a cursory overview of the findings, it can be suggested that the dimensions offered by the interviewees in relation to social barriers in CW and practices in construction business and project delivery could be seen to be in congruence with existing knowledge expressed in literature in other sectors such as manufacturing, production and service delivery. Additionally, the findings also reveal
intriguing revelations that are peculiar to construction business environment and further reinforce that social barriers are real in construction CW.

### Table 1

<table>
<thead>
<tr>
<th>Job title</th>
<th>Responsibilities</th>
<th>Average years of experience</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project manager</td>
<td>Coordinate production, liaison to subcontractors and source out materials and construction process</td>
<td>13 years</td>
<td>2</td>
</tr>
<tr>
<td>Site agent</td>
<td>Facilitate all activity on site, including people, machines, subcontractors</td>
<td>19 years</td>
<td>2</td>
</tr>
<tr>
<td>Supply and install subcontractor</td>
<td>Supply and installation of specialist work, including: plumbing and drainage; mechanical components; electrical components; aluminium glass; ceiling and partitioning</td>
<td>12 years</td>
<td>5</td>
</tr>
<tr>
<td>Foremen</td>
<td>Oversee wet trades and specialist trades, quality of production, supervise housekeeping, safety on site and strict adherence to programme.</td>
<td>14 years</td>
<td>7</td>
</tr>
<tr>
<td>Labour-only subcontractors</td>
<td>Supervise labourers undertaking: brickwork, paving and plastering.</td>
<td>13 years</td>
<td>8</td>
</tr>
<tr>
<td>Construction manager</td>
<td>Coordinate project information, programmes, monitor results of concrete, compaction, liaising with professional team</td>
<td>8 years</td>
<td>1</td>
</tr>
</tbody>
</table>

Total case study interviewees: 25

Note: Field data.

### 4.3 Concurrence of findings with theory and relevance to CW in project delivery

It should be noted that the main theoretical premise for the study was based on the social cognitive theory in which it was postulated that, the typologies of social barriers that could exist in CW and practices in construction business and project delivery are likely to be in the form of personal, behavioural and environmental factors. The theory of social cognitive behaviour posits that, in any context, there is an interplay of personal, behavioural and environmental factors that influences triadic cognitive disposition and outcome (Wood and Bandura, 1989). By applying it to the dimensions of social barriers, the summary of findings here in presented in Table 2, show enough evidence of personal, behavioural and environmental dimensions of the social barriers in CW in construction business and project delivery. It can further be suggested that, from their experiences accounted, behavioural dimensions were dominating. A plausible explanation for this findings could thus be said that indeed, teamwork, CW, managerial and performance actions are more embedded in the behavioural domain where participants are induce by their personal cognitive abilities, cultural orientations and contextual factors to their behaviours and psychology (Bennett-Levy, 2003; Bennett-Levy et al., 2004).
Table 2  Dimensions of social barriers to CW and practices

<table>
<thead>
<tr>
<th>Dimensions of social barriers to collaborative working</th>
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<tbody>
<tr>
<td><strong>Personal dimension</strong></td>
</tr>
<tr>
<td>Lack willingness to share information (19)</td>
</tr>
<tr>
<td>Fear of penalty for sharing information with others (15)</td>
</tr>
<tr>
<td>Inability to integrate into team work and often unwilling to participate (6)</td>
</tr>
<tr>
<td>Unwillingness to accept new ideas and resistance to change (8)</td>
</tr>
<tr>
<td>Unwillingness to undergo training for fear of being laughed at or mocked by colleagues (14)</td>
</tr>
<tr>
<td>Being overwhelmed by volume of work to be done (4)</td>
</tr>
<tr>
<td></td>
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</table>

Note: *Figures in parenthesis ( ) stands for number of times (counts) the identified social barrier appeared in the interview among the various respondents.

To this end, it can be affirmed that, these dimensions herein exposed by this study cannot be overlooked if significant strides are to be made in improving relationships, performance and effectiveness in CW as a sure alternative procurement model for construction businesses and project delivery. Hence, by distinguishing the dimensions of social barriers to CW, it affords stakeholders and practitioners to focus their efforts and interventions in ameliorating these typologies of social barriers. The theoretical insights provided by the findings can thus be considered very useful for practitioners in fashioning out methods, approaches and interventions aimed at culling and controlling the occurrence of these barriers or understanding their potential influence to effective CW in construction SC. Such control measures and interventions could be target at mitigating specific dimension of social barriers than being generic as in previously when these dimensions were not exposed.
5 Discussion of findings

The exploratory evaluation on the dimensions of social barriers in CW and practices in construction project delivery as summarised in Table 2 reveals ones with are in congruence and consistent with body of knowledge in manufacturing, production and service delivery sectors. Likewise, it also further brought to light some dimensions which are unique to construction collaborative SC.

The empirical insights captured a number of personal dimensions of social barriers to construction CW and practices. Evidence from the findings, it was clear that, notable personal dimensions of social barriers related to unwillingness to share information, being afraid to share information due to possibility of being penalised, not accepting new ideas and training. The prevalence of personal dimensions of social barriers in construction SC could be summed up by one quote from the interview saying:

“…. sometimes it becomes very frustrating to progress because people are just unwilling to talk and share the needed information and corporate for no reason….[Site Agent].”

It has been argued that, the effectiveness of the CW and practices is highly dependent on the social interpersonal dimensions of interactions (Pala et al., 2012; Xue et al., 2005). Cursory evidence seems to suggest that personal behaviours form a major barrier and inhibitor to CW in SC as noted by Briscoe et al. (2001). In the light of this it can be said that, interpersonal dimensions of social barriers in SC is not only common to manufacturing, production and service delivery sectors. Khurana et al. (2011) revealed that, barriers originating from individuals or work groups are very common in manufacturing SC and key among these barriers is unwillingness to share information. However, it can be asserted that, effective interpersonal behaviour is a key enabler of CW in SC. It is also the building block for healthy relationship among SCs (Pala et al., 2012; Xu et al., 2005; Rahman and Kumaraswamy, 2008). Against this, it can be stressed that, the revelation of this dimension of social barriers in collaboration working though is in congruence with happenings in SC in other sectors, it is important for stakeholders in the construction sector needs an urgent attention to deal with this in order to harness the full benefits of CW. This is because, construction project delivery project is interdependent, information dependent and rely on the cooperation of participants. Hence, if persons in CW are not willing to share information and cooperate, any investment on collaborative communication technology may not yield adequate results. However, a study by Constant et al. (1994) suggested that, individuals’ attitude towards information sharing and cooperation in a SC can be enhanced if they feel happy in their working environment and organisation. This suggests that, personal dimensions of social barriers can plausibly be influenced by the organisational factors and environment they work in.

Within the context of CW in construction environment, it can be contended that, the importance of behavioural dimensions have repeatedly been cited as a precursor to successful outcomes and performance (Ankrah et al., 2009). Here in this study, trust, excessive rivalry, cultural orientation, lack of commitment dominated the behavioural dimensions of social barriers to CW in construction project delivery. This was echoed in a typical statement by one of the interviewees as:

“….sometimes it is impossible to trust and rely on people working with you as they behave as if they are in competition and have things to hide… [Project Manager].”
Experiences of trust breakdown and cultural incompatibility have overly been reported and acknowledged in construction SC (see Cicmil and Marshall, 2005; Cheung et al., 2003; Ankrah et al., 2009). Likewise, several studies have professed ways and models of improving this situation in construction project delivery (see Rahman and Kumaraswamy, 2008; Xue et al., 2005). The emergence of this findings here suggest that, trust and cultural issues still permeate the social barriers in the behavioural dimension in construction CW. It can be said that trust is an essential factor in culling and improving the adversarial nature of the construction SC environment through relationship building. Cicmil and Marshall (2005) revealed that social interactions in CW can be improved through building trust. Fawcett et al. (2008) further intimated that, human behaviour (embedded in cultural diversity, functional conflicts, competing goals, lack of commitment, non-transparency and lack of trust) is often accounted as the primary root of most frustrations in SCs. Hence, the ability of SCs to be successful is dependent on how they adopt strategic means and approaches to mitigate the occurrence of behavioural social barriers.

The study have also given evidence of environmental factors dimension of social barriers in CW in the form of poor reporting procedure, lack of rewards and recognition, lack of support systems and varying values. It further prove that indeed, construction collaborative SCs suffer from the effect of the environmental social systems that exist. Xue et al. (2010) intimated that, business environment play effective role in CW. In this regard, if success is to be made, collaborative environmental culture and strategy must be adopted to change the adversarial relationship and fragmented operation processes in construction project delivery. This will aid in harnessing the full benefits of CW which is touted to offer enhanced performance over traditional SC systems. The evidence of the social environmental barriers was succinctly expressed by the statement made by one of the interviewees as:

“…..it is often very frustrating sometimes not knowing who to report, where to go to or who to deliver to in the construction process…[Supply Subcontractor].”

This clearly suggest that there is the need to improve procedure. Protocols and structures in CW. Xue et al. (2010) further revealed that, environmental uncertainty, behavioural complexity, and cultural diversity often aggravate the complexity of CW and thus more effort is needed for improvement. With the exposition given, it is clear to understand that the dimensions of the social barriers in CW in construction business and project delivery cannot be overlooked and thus attention must be given to these dimensions.

6 Conclusions

There are plethora of studies alluding to the evidence of social barriers in CW and practices in constructions. However, there is apparent gap in these studies is their failure to profess the dimensions of these social barriers. This study has been undertaken primarily in an effort to bridge this notable gap in knowledge regarding the dimensions of social barriers experienced in CW and practices in construction business and project delivery. Hence, this study through the application of the social cognitive theory and an exploratory qualitative design using interview in selected three project case studies has revealed the gamut of the dimensions of social barriers in construction CW and practices.
The empirical insights from the study show evidence of personal cognitive dimensions of social barriers in CW which are depicted by ‘Lack willingness to share information’, ‘Fear of penalty for sharing information with others’, ‘Inability to integrate into team work and often unwilling to participate’, ‘Unwillingness to accept new ideas and resistance to change’, ‘Unwillingness to undergo training for fear of being laughed at or mocked by colleagues’ and ‘Being overwhelmed by volume of work to be done’. Likewise form the environmental dimensions, ‘Lack of efficient reporting procedure and chain of command’, ‘Unfair and not well structured conflict resolution mechanism’, ‘Lack of recognition, rewards and commendations for doing things very well and exceptionally’, ‘Lack of support, encouragement and motivation to innovate and use new technology’ and ‘Varying values, cultural and linguistic environment’ were identified. From the findings, it can be concluded that, behavioural dimensions were dominant and also, there is enough evidence to suggest that, there is an interplay of the three dimensions of social barriers in CW and practices in construction business and project delivery.

It can be affirmed that the dimensions of social barriers are real in CW and practices in construction project delivery and thus cannot be overlooked if improvements in collaborative SC is to see improvement and effectiveness. There is widespread consensus among practitioners that understanding the nature of social barriers in CW is sine-qua-non to identifying appropriate measures to improving the social dispositions in construction SCs. In this respect, construction industry stands to benefits from the findings of this study towards improving CW and practices.

7 Limitations and further studies

It is important to highlight the limitations of the study to allow for the findings to be applied and generalised in context without any violation and misapplication. From the position of the social cognitive theory, the three main dimensions are said to be bi-directional and influence each other. However, in this study, this dimension was not explored as the main focus was to explore the dimensions of the social barriers in CW. Against this, the knowledge herein generated will be enriched if further studies seek to explore the bi-directional nature of the influences of these dimensions of social barriers on each other. Likewise, it is important to note that, several studies have highlighted the perceived influence of social barriers to CW and other forms of construction SC. It will thus broaden the horizon of this study is further studies are undertaken to explore this direction.

The authors are again well aware of the limitation of the use of case study as the main research approach (see Yin, 2013; Creswell, 2009). Due to the limitation in extensive generalisation of the findings inherent from case study research design, it recommended for further studies to explore the extent of occurrence of theses dimensions on construction SCs in an extensive survey in order to enhance theoretical validity and triangulation of the knowledge generated here. Also, one area worth acknowledging as the limitation of the study is the consideration of culture as part of social barriers. On this, there is seemingly lack of consensus as other works see culture as a separate barrier while others consider as part of organisational barriers. Likewise other studies consider it as part of social barriers (see Khurana et al., 2011; Fawcett et al., 2008; Cicmil and Marshall, 2005; Kelly, 2011). It must be acknowledged that, this study perceived and
considered culture as a broad concept in collaborative barriers and thus must be considered separately in detail. Hence, further studies are recommended to explore the cultural dimensions of barriers to CW in construction SC.

References


Dimensions of social barriers to effective collaborative working


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## Appendix

### Table A1  Dimensions of social barriers to CW and practices (interview protocol)

<table>
<thead>
<tr>
<th>Dimension of social barriers</th>
<th>Sub theme</th>
<th>Source of respondents</th>
<th>Total (25)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personal dimension</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack willingness to share information</td>
<td>Communication</td>
<td>SA (2), PM (2) LS (6), FM (6), SS (3)</td>
<td>19</td>
<td>76</td>
</tr>
<tr>
<td>Fear of penalty for sharing information with others</td>
<td>Communication</td>
<td>SA (1), PM (2) FM (5), SS (3), CM (1), LS(2)</td>
<td>15</td>
<td>60</td>
</tr>
<tr>
<td>Inability to integrate into team work and often unwilling to participate</td>
<td>Cooperation</td>
<td>PM (1), SA (1), FM (2), SS (2)</td>
<td>6</td>
<td>24</td>
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<tr>
<td>Unwillingness to accept new ideas and resistance to change</td>
<td>Innovation</td>
<td>PM (2) FM (4), CM (1), LS(1)</td>
<td>8</td>
<td>32</td>
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<tr>
<td>Unwillingness to undergo training for fear of being laughed at or mocked by colleagues</td>
<td>Cooperation</td>
<td>SS (4), SA (1), PM (2) FM (4), CM (1), LS(2)</td>
<td>14</td>
<td>56</td>
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<tr>
<td>Being overwhelmed by volume of work to be done</td>
<td>Coordination</td>
<td>SS (2), SA (1), FM (1)</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td><strong>Behavioural dimension</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excessive rivalry among participants and teams</td>
<td>Competition</td>
<td>CM (1), LS(3), PM (2) SS (3)</td>
<td>9</td>
<td>36</td>
</tr>
<tr>
<td>Reluctance to take instructions due to cultural orientation</td>
<td>Cooperation</td>
<td>FM (6), SS (3), CM (1), LS(2), SA (2), PM (2)</td>
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<td>64</td>
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<tr>
<td>In ability to use existing laid down methods and modalities</td>
<td>Protocol</td>
<td>PM (1), FM (7), SS (4), CM (1), SA (1)</td>
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<td>56</td>
</tr>
<tr>
<td>Fear of embarrassment for acting, doing task and sharing information wrongly</td>
<td>Communication</td>
<td>FM (3), SS (3),</td>
<td>6</td>
<td>24</td>
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<tr>
<td>Lack of know-how and commitment to use existing technology for tasks and function</td>
<td>Innovation</td>
<td>CM (1), LS(3), PM (2) SS (3), LS (1), SA (2)</td>
<td>12</td>
<td>48</td>
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<tr>
<td>Competing diverse goals, missions and priority</td>
<td>Competition</td>
<td>LS(3), PM (1), CM (1), SS (4)</td>
<td>9</td>
<td>36</td>
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<tr>
<td>Lack of commitment from participants</td>
<td>Commitment</td>
<td>FM (6), SS (4), CM (1), SA (2), LS (5)</td>
<td>18</td>
<td>72</td>
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</tbody>
</table>

Notes: PM = project manager, SA = site agent, CM = construction manager, SS = supply sub-contractor, LS = labour sub-contractor, FM = Forman.
<table>
<thead>
<tr>
<th>Dimension of social barriers</th>
<th>Sub theme</th>
<th>Source of respondents</th>
<th>Total (25)</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
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<td>Sometimes giving more or less information than required</td>
<td>Communication</td>
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<tr>
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<td>FM (1), SS (2), LS (1)</td>
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<tr>
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<td>CM (1), LS(5) SS (5), LS (5), SA (2)</td>
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<tr>
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<td>SA (2), SS (2), LS(3), FM (4), CM (1)</td>
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