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Inter-organisational communication: organisational future orientation, inter-organisational interaction quality and inter-organisational group mechanism

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Abstract

The purpose of this study is to investigate the effect of organisational future orientation and interaction quality on inter-organisational communication, and the mediating role of inter-organisational group mechanism on the relationship between organisational future orientation, interaction quality and inter-organisational communication. A questionnaire assessing the experience of organisational future orientation, inter-organisational interaction quality, inter-organisational group mechanism and inter-organisational communication was administered to 101 out of 136 humanitarian organisations delivering social services to refugee settlements in Uganda. The proposed hypotheses were tested using PLS-SEM in the SmartPLS version 3.3.0 for professionals. The paper found that organisational future orientation has a positive impact on inter-organisational communication. Inter-organisational group mechanism partially mediates organisational future orientation and inter-organisational communication whilst it fully mediates the relationship between inter-organisational interaction quality and inter-organisational communication. The findings of this research provide useful insights into the role of inter-organisational group mechanism in boosting the role of organisational future orientation and interaction quality in inter-organisational communication in humanitarian relief delivery. Hence, a high level of inter-organisational group mechanism not only improves inter-organisational communication in humanitarian relief delivery but also enhances the benefits of organisational future orientation and interaction quality for inter-organisational communication. This research is one of the limited studies that investigate the effect of organisation future orientation and interaction quality on inter-organisational group mechanism and inter-organisational communication in humanitarian relief delivery in sub-Saharan Africa.

Introduction

In the last few decades, an exponential increase in the number of disasters and their complexity has been reported, which has ultimately attracted a multitude of relief organisations. These organisations, which are involved in relief efforts, have a duty to synchronise their end-to-end activities in order to provide relief

effectively and efficiently. Consequently, to smoothen the flow of relief operations, the exchange of critical information among themselves in the humanitarian supply chain serves as a prerequisite for successful relief operations (Wankmüller and Reiner 2020; Azmat et al. 2019). Herein, the frequent exchange of accurate and timely information directly or indirectly among co-operating partners in relief delivery activities to meet the needs of disaster victims implies inter-organisational communication (Bisri 2016).

The exchange of information enables operating partners to understand the needs of disaster victims and

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organise the right response, increase timely response and undertake appropriate co-ordination among themselves (Pedraza-Martinez and Van Wassenhove 2012). It also enables the organisations to plan structured interaction and sharing of the right resources, which leads to long-term relationships (Wankmüller and Reiner 2020), goal congruence, decision synchronisation, incentive alignment and joint knowledge creation (Martin et al. 2016), besides enhancing sustainable performance (Li et al. 2019) and influencing vertical collaboration among relief organisations (Moshtari 2013). Besides, according to Siawsh et al. (2019), inefficient communication among humanitarian organisations engaged in relief operations can hinder effective and efficient co-ordination, which can lead to poor task co-ordination, increased suffering among disaster victims (John et al. 2019; Bealt et al. 2016), overlap and duplication of relief operations (Jahre and Jensen 2010), an increase in operational costs (Jabbour et al. 2019; Van Wassenhove 2006), and slow and unfair distribution of supplies (Dubey et al. 2019).

As Pescaroli and Kelman (2017) postulate, the operational environment after the occurrence of a disaster is often inherently unstable, characterised by high levels of turbulence, such as infrastructure breakdown, involving telephone lines and roads, and, at the same time, the influx of many actors with differing mandates to the site (El Khaled and Mcheick 2019). This volatile condition impairs the information transmission process and suppresses the inter-organisational information exchange effort, thus affecting the ability of the organisations to act and respond in a timely manner to the needs of the victims, the areas where relief efforts are more critical and the resources needed, leading to poor co-ordination capabilities between the various organisations (L'Hermitte et al. 2016) and wastage of resources (Nurmala et al. 2017). Thus, clarifying and increasing understanding of how humanitarian organisations may improve information's exchange among themselves amidst conditions of change is of vital importance (Bisri 2016).

Extant literature has focused on how organisations can improve communication among relief organisations through mechanisms such as information and communication technologies (ICTs) (Behl and Dutta 2019; Yang et al. 2009); trust and role clarity (Kapucu and Demiroz 2017; Awasthy et al. 2019); formal governance and detailed contracts (Gulati et al. 2012); emergency organisation, information resource and plan obstacles (Zhang et al. 2017); cognition of risk (Comfort 2007); *inter-organisational* information-sharing systems (Bharosa et al. 2009); organisational communication culture (Pechta 2013); organisational structure, co-ordination, security, politics and funding (Mairers

et al. 2005); sharing of resources horizontally, such as setting up joint distribution centres and holding joint co-ordination meetings (Pazirandeh and Maghsoudi 2018) and information-sharing, diversity of the humanitarian agencies, organisational mandates and material convergence (John et al. 2019; Suzuki et al. 2018). The above studies largely ignore the role of organisational future orientation, interaction quality and inter-organisational group mechanism as antecedents of inter-organisational communication. Yet, these factors have been inferred to lead to inter-organisational communication during relief operations by earlier scholars, such as Zhang et al. (2017) and Kapucu and Hu (2014), and to the mediating role of inter-organisational group mechanism between organisational future orientation, interaction quality and inter-organisational communication. In this sense, we contribute to filling in the gap identified in the literature by exploring how organisational future orientation, interaction quality and inter-organisational group mechanism, affect inter-organisational communication during relief delivery. To this end, we study the mediating role of inter-organisational group mechanism to explain the relationship between organisational future orientation, interaction quality and inter-organisational communication.

To test the model, we conducted a survey and collected self-administered data for analysis. The proposed relationships were then tested using partial least square structural equation modelling (PLS-SEM). Our findings indicate that organisational future orientation, inter-organisational interaction quality and inter-organisational group mechanism are significantly related with inter-organisational communication. This study shows that inter-organisational group mechanism should be considered as a conduit through which organisational future orientation and interaction quality enhance inter-organisational communication. The study is organised as follows: The next section provides a theoretical model and the proposed hypotheses. Next, the methodology section describes the research methods. The results section then discusses the findings. Finally, the paper concludes with a discussion of the implications and limitations of the current study and provides directions for future research.

Theoretical and hypothesis development

We theorise how humanitarian organisations can effectively deal with information exchange among themselves in emergency situations to create and sustain timely relief delivery. We developed a set of research hypotheses to summarise our reasoning.

Theoretical underpinning

Complex adaptive system theory (CAS) posits that organisational future orientation and interaction quality are the basis for inter-organisational group mechanism and are thus prerequisites for communication among organisations (Dooley 1997; Lewin et al. 1998; Pitt et al. 2011). Inter-organisational communication is a complex adaptive system since it reflects the main features of a CAS. Notably, a system of communicating individual agents strives to achieve their goals by addressing their concerns, but end up causing the emergence of similar collective patterns at the wider system level. Thus, this perspective assumes that organisational future orientation and interaction quality are considered first, then inter-organisational communication is possible as it involves the sharing and exchange of information among the different organisations so that they are able to synchronise their work and harmoniously work together to achieve their collective goals. CAS underpins this study because it explains the organisational future orientation, interaction quality, inter-organisational group mechanism and inter-organisational communication study variables during service delivery in a complex environment (Comfort et al. 2004; Guastello 2013).

Organisational future orientation and inter-organisational communication

According to Shumate et al. (2016) and Paulraj et al. (2008), organisational future orientation may promote inter-organisational communication, resulting in the building of stronger interactive connections during relief delivery. With such an orientation, operating partners are able to focus on information development and exchange and increase investment in collaborative competencies (Billings et al. 2019). Insofar as these communicating competencies are 'socially created', resulting from ongoing inter-organisational communication among exchange partners Dentoni et al. (2016) and are not easily tradable (Paulraj et al. 2008), they may confer durable strategic advantages on the humanitarian relief chain partners (Wankmüller and Reiner 2020; Akhtar et al. 2012). Thus, organisational future orientation on the part of humanitarian organisations provides the strategic context necessary for fostering inter-organisational communication.

Such an organisational orientation correspondingly enables the exchange parties to cultivate relational norms that promote cooperation for the achievement of mutual goals (Shumate et al. 2016). Paulraj et al. (2008) indicate that anticipated gains from mutual communication are possible because the future orientation casts a protracted shadow back upon the present, affecting current behaviour patterns (Ferreira et al. 2014). Okun (2015) advances

that operating partners that adopt a long-term orientation tend to rely on 'understandings and conventions involving fair play and good faith'. Furthermore, Dyer and Singh (1998) posit that any agreements between them are enforceable largely through group processes rather than through external arbitration or the courts. Therefore, future orientation permits communication and the exchange of information and knowledge, lowers transaction costs and enhances transaction value through strategic collaboration. On the contrary, a short-term-oriented organisation focuses on transaction cost economising can inhibit the development of relational competencies, frustrate inter-organisational communication and amplify opportunism, which ultimately dissolves relational rents (Gerdoci et al. 2016). In relation to the above argument, CAS theory posits, in uncertain operating environment, future oriented (foresight) enable organisations to search for new solutions, disseminating information, interpreting existing information to create new knowledge (Turner and Baker 2019). This is characterised by space and agents which enable creation of temporal ties, relations between the agents that are specific to future orientation context (Grillitsch and Sotarauta 2019). This study extends the CAS theory views by linking inter-organisational future orientation and inter-organisational communication as enabler of inter-organisational co-ordination debate in the context of relief delivery in developing countries. This cognitive leads to the following hypothesis:

H₁: Organisational future orientation is positively related to inter-organisational communication during relief delivery.

Organisational future orientation and inter-organisational group mechanism

Chaudhri et al. (2019) note that research into organisational future orientation completes a significant gap in the field of humanitarian relief delivery research. Organisational future orientation serves as a temporal perspective of humanitarian organisation preparedness for future operational change and positioning in the light of such change (Clarke and Ramalingam 2008; Borton 2009). Bisri (2016) indicates that the core aspects of organisational future orientation are directly linked to inter-organisational group mechanism in relief delivery. Similarly, Cannon et al. (2010) demonstrate that the long-term orientation of an organisation positively influences the group mechanisms used to co-ordinate relief activities. These group mechanisms are characterised, respectively, by mutual goals, shared values and systems and joint problem planning and problem-solving. Previous research (Maghsoudi et al. 2018) notes that

organisational future orientation is critical in forming group mechanisms for co-ordinating relief delivery activities (Wankmüller and Reiner 2020), which fosters communication among the members forming a group. Given this relationship, we posit that there exists a positive relationship between organisational future orientation and inter-organisational group mechanism in a relief delivery context. That is, a higher level of organisational future orientation is expected to increase the adoption of the group mechanism needed for co-ordinating organisational relief activities. Therefore, we hypothesise that:

H₂: Organisational future orientation will have a positive influence on inter-organisational group mechanism.

Inter-organisational group mechanism and inter-organisational communication

Akhtar et al. (2012) posit that inter-organisational group mechanisms (formal groups and formal roles) are associated with inter-organisational communication. They advance that the inter-organisational group mechanisms provide greater co-ordination benefits and lower relief delivery costs (Daft 1992). These inter-organisational group mechanisms lead, direct and make major decisions and even manage the complex relationships that characterise the co-ordination of relief operations (Akhtar et al. 2012). Balcik et al. (2010) observe that two group mechanisms are likely to be valued, i.e., a steering committee with operating partner representation and a standing team of managers of humanitarian organisations, and a decentralised relief co-ordinator. These are likely to be important in fostering communication in the context of relief operations in emergency situations. According to Adem et al. (2018), inter-organisational group mechanisms increase the information processing capacity under conditions of high environmental uncertainty, but also serve as lateral design tools to build and foster collaborative behaviours such as information exchange and organisational learning in today's increasingly complex and uncertain operational environments (Boyce et al. 2016). In addition, group mechanisms enable geographically separated organisations to share information through group platforms to improve the cost/benefit tradeoffs of communication (Al Adem 2017; Houghton 2011). Also, inter-organisational group mechanisms are widely used and can be effective top-down design tools to achieve co-ordination across operating organisational departments, as well as co-ordination across co-operating partners. Therefore, we hypothesise that:

H₃: Inter-organisational group mechanism will have a positive influence on inter-organisational communication

Organisational future orientation, inter-organisational group mechanism and inter-organisational communication

To mitigate the risks related to organisational opportunistic behaviour, as well as other unforeseeable eventualities, CAS theorists suggest that the partners must craft group systems (Turner et al. 2018). Group systems are strategies designed to encourage liaison contacts between two or more humanitarian organisations in order to efficiently co-ordinate their work in which each party's rights, duties and responsibilities are specified (Gerdoci et al. 2016; Brown 1999). They explicitly prescribe roles and obligations, determine the content of the information to be exchanged and delineate the division of activities, operational zones or settlement (Brown 1999). Thus, group mechanisms achieve mutual communication and increase their ability to handle information with different cost/benefit tradeoffs (Sidarus et al. 2019). The theoretical tradeoff is that group mechanisms help humanitarian organisations reduce lateral information processing and co-ordination costs as it is easier to find skilled human resources for handling emergency situations communication (Jensen and Hertz 2016) than when an individual humanitarian actor handles such communication individually (Akhtar et al. 2012; Balcik et al. 2010).

We argue that group mechanisms can improve inter-organisational communication by reducing the opportunistic behaviours of each organisation and in facilitating mutual trust among operating partners to share accurate operational information, which humanitarian beneficiaries need in a timely manner and frequently in order to make decisions related to their responsibility (Brugh et al. 2019). Group mechanisms that are constituted to co-ordinate temporary relief activities for problem-solving, such as ad hoc taskforces or more permanent teams that have representatives from various organisations, and formal roles responsible for collaboration across different organisations within a relief supply chain, such as lower-level liaison roles and full-time integrating co-ordinators, facilitate cohesion among operating actors.

Empirically, many studies proclaim that group mechanisms are effective in enabling organisations to minimise operational risks (Lichtenstein et al. 2006). Therefore, group mechanisms are likely to increase cohesion among co-operating partners, and CAS also posits that cohesion is positively related to mutual communication, since the success of a relationship and organisational future orientation in relief delivery rely on joint efforts of the partners. Hence, group mechanisms narrow the gap between organisations, which fosters the exchange of operational information and thereby encourages subsequent co-operation (Hagemann and Kluge 2017). In the light of this evidence, group mechanisms are expected to increase

communication among relief organisations during relief delivery in the context of Africa. Hence:

H₄: Inter-organisational group mechanism significantly mediates between organisational future orientation and inter-organisational communication

Organisational future orientation and interaction quality

L'Hermitte et al. (2016) argue that organisational future orientation is important in helping managers to have a more robust view of interactions with other organisations. Organisational future orientation is conceptualised as being a temporal perspective of humanitarian organisation preparedness for future operational change and positioning in the light of such change. This necessitates an organisation to continuously look for new solutions, create and transfer knowledge and modify its plans and ways of functioning accordingly. This helps an organisation to maintain a clear direction for action throughout and to sustain a strong identity (Reilly 1998), which is necessary to steer individuals, teams and the whole organisational system when they are exposed to unexpected and disrupting circumstances (Elfenbein and O'Reilly III 2007). The existing literature indicates that organisational future orientation is a key determinant of interaction quality between operating partners (Ryu and Moon 2009). Thus, organisational future orientation enhances interaction quality because it provides perspective and direction, assists people and teams in setting the right priorities and, ultimately, establishes a foundation for interacting with other organisations by generating trust and suppressing conflict. In addition, being future oriented enables organisations to have day-to-day interactions with operating partners for learning and acquiring new ideas and practices, and to develop skills (Linder and Foss 2018), and helps the organisations achieve long-term success (Chadwick and Raver 2015). Organisational future orientation is also a unique operational solution to problems (Aroles and McLean 2016) as it represents a way of 'fighting to survive' in a challenging relief landscape. As a result of the efforts an organisation undertakes towards building collaboration with its stakeholders, its organisational visibility increases (Jabour et al. 2019), and thus it attracts funding and mobilises resources for the implementation of its future relief activities (Strauss and Parker 2018). Furthermore, earlier works by Majewski et al. (2010) and Heaslip et al. (2012) recognise that for an organisation to respond proactively, rapidly and effectively to changes in the environment, it requires continuous interaction, and that it question how it operates and the adequacy of its interaction with others. The organisation learns from the interaction and ensures that appropriate action is taken as a result of

these experiences, and shares lessons to improve future ways of working (L'Hermitte et al. 2016) by identifying past operational successes and failures, critically evaluating these past experiences to re-evaluate and improve current practices. Sharing these lessons enables an organisation not only to create and transfer knowledge but also to improve its operations as well as the management of change and uncertainty (Janus 2016), where immediate problems are fixed, and to reconsider issues that go beyond the current relief operations (DuBois 2018). Hence, it is hypothesised as follows:

H₅: Organisational future orientation and interaction quality are positively related

Organisational future orientation, interaction quality and inter-organisational group mechanism

Antoldi and Cerrato (2020) indicate that group mechanisms, both formal and informal, increase trust among interacting partners to exchange information freely. They argue that group mechanisms mitigate opportunism among communicating organisations and improves each organisation's performance. In addition, inter-organisational group mechanisms are regarded as a means to synchronise activities, to create mutual understanding of problems and to encourage organisational commitment to make specific investments associated with information exchange for the achievement of shared goals (Kozlowski and Bell 2003). Furthermore, the existence of group mechanisms among interacting organisations facilitates joint planning and joint problem-solving (Kumar et al. 2017) and creates stable and committed relationships; thus, it is recognised as the basis for inter-organisational communication (Hagemann and Kluge 2017). Therefore, both formal and informal groups should be focused on the effective reception and exchange of information (Fu et al. 2019). CAS considers that group mechanisms develop when interacting organisations act reliably and fairly, do not take advantage of each other and are devoted to a mutual commitment (Turner et al. 2018; Nilsson 2003). Empirically, Fu et al. (2019) and Zanini and Migueles (2013) also find a positive relationship between interaction quality and informal group mechanism; likewise, Shittu et al. (2018) and Stephenson Jr. (2005) find that relief operators rely more on increased inter-agency communication, both formal and informal. Several researchers have paid attention to inter-organisational group mechanisms and their benefits from theoretical and empirical perspectives (Doessing 2018). The benefits from group mechanisms can be, for instance, a reduction of costs related to information generation and increased information-sharing. Strong empirical evidence suggests that partners are likely to engage in

extensive communication and novel information-sharing on an informal basis, which helps in coming up with a timely response to victims' needs (Saavedra and Knox-Clarkem 2015; Bisri 2016).

Therefore:

H₆: Interaction quality significantly mediates organisational future orientation, and inter-organisational group mechanism.

Interaction quality and inter-organisational communication

Melin and Axelsson (2013) propose that inter-organisational interaction quality among operating partners, which is the perceived contribution of the amount, direction and quality of work-oriented activity each operating partner puts forth towards the achievement of mutual goals, is a critical element of inter-organisational communication. The perceived inter-organisational interaction quality, based on clues from interactions, occurs explicitly (through helping others with strong ties, such as a Red Cross Society movement member, to access the necessary information to enable them to fulfil their mandate) and implicitly (through interactions with other organisations within the relief delivery chain with loose ties). The explicit interactions elicit the sharing of information and monitoring of each other's activities, which subsequently influences effective relief delivery by the organisations. Janus (2016) also argues that knowledgeable and experienced organisations may influence other organisations' experience by disseminating useful knowledge. Furthermore, such interactions among organisations provide such dimensions as links, bonds and ties, which facilitate communication among members (Shumate et al. 2016). A link implies a connection between organisational activities, such as administrative, technical and commercial ones, which are a sequence of acts directed towards a purpose (Snehota and Hakansson 1995). It is these links between organisational activities that reflect the need for the co-ordination and communication necessary for the accomplishment of these activities. Also, the interacting actors match their resources, which consequently enhances their communication effectiveness. These links create structures and communication patterns among network members. Bonds between the actors in a network allow them to acquire meaning in their reciprocal acts and interpretation to achieve co-ordination as a means of saving resources, gaining access to suitable co-operators and maintaining a certain position in the network (Snehota and Hakansson 1995). This phenomenon leads us to suggest that a positive relationship exists between inter-organisational interaction quality and inter-organisational communication. Therefore, we state the following hypothesis.

H₇: There is a positive relationship between inter-organisational interaction quality and inter-organisational communication

Interaction quality and inter-organisational group mechanism

Previous research suggests that inter-organisational interaction quality has a critical impact on inter-organisational group mechanisms (Kotzab et al. 2019; Howard et al. 2019). They suggest that operating partners in a specific sector of relief delivery adopt group mechanisms that enable them to co-ordinate their relief activities. In a similar vein, Nurmala et al. (2017) posit that interaction quality among relief responders has a direct influence on the relief delivery mechanism adopted among them, and Bealt et al. (2016) suggest that organisational efforts and group mechanisms among organisations with strong ties are antecedents of inter-organisational group mechanism. In particular, for acceptable group mechanisms, such as standing and steering committees, interaction quality has a significant impact on group mechanism outcomes (Roehrich et al. 2020) because member organisations may not have difficulty in accurately evaluating group mechanism outcomes. Hence, it is likely that the key elements of inter-organisational interaction quality, such as links, bonds and ties, are considered critical in driving the group mechanism to be used. When a humanitarian organisation is well-informed about the progress of its relief operations through its interactions (inter-agency and sectoral or operational zone meetings), this may lower the degree of uncertainty regarding its activities, which is likely to improve its performance-related outcomes like stable relations, increased administrative resources and a stronger activity link (Krackhardt and Stern 1988). This leads us to suggest that there exists a positive relationship between inter-organisational interaction quality and inter-organisational group mechanism. Therefore, we hypothesise that:

H₈: Inter-organisational interaction quality will have a positive influence on inter-organisational group mechanism

Interaction quality, inter-organisational group mechanism and inter-organisational communication

Inter-organisational group mechanisms such as a relief taskforce and a steering committee typically create a lateral organisation capability between organisations. The usage of an activity steering committee with organisational representatives is associated with several favourable interaction outcomes, including effective co-ordination and integration of relief delivery activities

(Reindorp and Wiles 2001), advanced relief budget and planning practices (Stockton 2002), large system relief monitoring (Minear 1992) and increased managerial support and funding (Grandori and Soda 1995). Two other field studies (Kozlowski and Bell 2012) describe evidence for the role of formal group mechanisms among interacting actors in increasing communication across independent operating entities. Kozlowski and Ilgen (2006) describe a case study in which a formal relief standing team mechanism is implemented after informal mechanisms (a conference, roundtable meeting) set up by interacting actors have failed to meet the need for coordination across self-autonomous organisations. The author also suggests that when self-autonomous organisations are geographically separated, groupware support in combination with a formal group mechanism improve communication cost/benefits tradeoffs. Even when the literature suggests that the central role of a group mechanism is to enable interacting organisations to improve communication among themselves, this remains anecdotal, which this study aims to confirm. Hence, we hypothesise that:

H₃: Inter-organisational group mechanism significantly mediates in the relationship between inter-organisational interaction quality and inter-organisational communication during relief delivery.

Methods

Research design, population and sample size

This study adopted a cross-sectional research design which is analytical in nature to collect and analyse data so as to establish the correlational effects on the hypotheses stated (Chih-Pei and Chang 2017). From 136 humanitarian organisations, a sample of 108 was arrived at basing on the sample size determination requirement (Hair et al. 2017) by means of power analysis that depends on the part of the model with the largest number of predictors. In line with Cohen (1988) and prior empirical studies (Kock 2018; Kock and Hadaya 2018), this study utilises a statistical power of 0.80 and a level of significance (α) = 0.05 and R^2 = 0.10. Given that the model complexity, represented by the number of independent variables in the path model, is 4; the estimated minimum sample size is 50 humanitarian organisations (Kock and Hadaya 2018). This is the minimum sample needed to achieve the statistical power of 0.80 for detecting R^2 values of at least 0.10 (with a 5% margin of error).

Sample design and procedure

We used simple random sampling to select the participating humanitarian organisations in this study. A randomised list of the humanitarian organisations that

participate in the delivery of relief services to refugee settlements in Uganda was obtained from the Office of the Prime Minister (OPM). This did not show the organisational name, but provided details on the category of service the organisation offers, the number of employees and their physical addresses. To enhance reliability and validity, we recalculated the randomised sequence of the organisation, where computer-assigned new random numbers were determined using the RAND function (=RAND ()) in MS Excel. The sample list was drawn based on the new computerised sequencing of the organisations established by sorting the organisations using the new assigned random numbers as criteria (smallest to largest), with the cut-off being the 109th organisation in the sequence. This further ensured objectivity and the mitigation of human biases in selecting participating organisations, thus enhancing generalisability of the study findings (Bryman and Bell 2015).

Instrument design

To develop the instrument, we adapted the measures for all the study variables from previously published work where reliability had been ensured. This was done to maintain study construct measurement properties where measurement quality remains an empirical concern that needs to be addressed as one moves from context to context (Barclay et al. 1995). We further refined the measurement items for the study construct by conducting in-depth interviews with 5 senior relief response managers from the leading humanitarian organisations with significant experience in their organisations' relief operations. They helped us to refine the appropriateness of the final instrument and the completeness of each study constructs measure. Additionally, senior academics with expertise in research and measurement scale development regarding clarity were consulted. Finally, we conducted a pilot study using a sample of 30 humanitarian organisations and, whilst referring to the insights gained from the pilot testing, we made further refinements to the questionnaires.

Operationalisation and measurement

In the operationalisation of each study construct, we were guided by the definition of the study construct in question (Petter et al. 2007). Basing on the extensive review of literature, we measured our study constructs with reflective measurement items. According to Diamantopoulos and Siguaw (2006), measurement items are either reflective or formative because the choice of the measurement specification determines the selection of data analysis and the assessment of reliability and validity. A confirmatory tetrad analysis (CTA) was performed to confirm the model specifications (Bollen and Bauldry

2011; Gudergan et al. 2008), and the results indicate that the measurement models for all constructs met the reflective model criteria. All the lower-order construct measurement items were developed on a six-point Likert scale (anchored in 1 = strongly disagree, 6 = strongly agree) to reduce the deviation arising from respondents' indecision and to increase the level of discrimination and reliability values (Chomeya 2010). The sub-sections detail how we operationalised the constructs.

Inter-organisational communication

Inter-organisational communication was measured with four items adapted from the published work of Olsson (2014) and Paulraj et al. (2008). The items included (1) share critical, sensitive information related to operational and strategic issues; (2) exchange such information frequently, informally and/or in a timely manner; (3) maintain frequent exchange of information and (4) closely monitor and stay abreast of events or changes that may affect both parties. These had earlier been found to be both reliable and valid ($\alpha = 0.86$; CR = 0.92; AVE = 0.66).

Organisational future orientation

This reflects a temporal perspective of humanitarian organisation preparedness for future operational change and positioning in the light of such change (Goldstein & Ford 2002; Morgan and Strong 2003). Four items were adapted from Ruvio et al. (2014) and Nestik (2017), which were all at organisational level: (1) establishes a realistic set of future goals for itself; (2) effectively ensures that all managers and employees share the same vision of the future; (3) conveys a clear sense of future direction to employees and (4) has a realistic vision of the future for all departments and employees with Cronbach's α ranged from .86 to .88.

Inter-organisational group mechanism

This refers to the structural overlays that operating partners use to accomplish their collectivities (Schopler 1987; May 2013; Ryu and Moon 2011). These include formal groups and formal roles (Brown 1999).

Inter-organisational interaction quality

Inter-organisational interaction quality is where all actors are connected to one another and the perceived contribution of the amount, direction and quality of work-oriented activity each operating partner puts forth towards the achievement of mutual goals (Dienesch and Liden 1986; Zaheer et al. 2010). Seven items were adapted from Graen et al. (1982), which include (1) the responsibility of an organisation; (2) an organisation's contribution to the quantity of solutions; (3) the efficiency of an organisation's contribution; (4) the usefulness of the

organisation's effort; (5) initiatives that an organisation takes to solve the problems; (6) the level of interaction with other organisations off the task and (7) an organisation's response to requests from other organisations for the tasks that are done together with others. These items were used by Bhal and Ansari (1996), who recommended them as reliable and valid for measuring interaction quality.

Data collection procedure and management

The data was collected with the help of a structured questionnaire to elicit responses from the humanitarian organisations selected for this study. This was intended to limit responses to alternative answers provided and to capture facts and specific information about the study variables. A sample was drawn from within each organisation that included managers such as the project/programme manager, the response manager, the logistics and supply chain manager and the disaster manager, who directly co-ordinate relief activities with other organisations. This sample frame provided an opportunity to evaluate the phenomenon of inter-organisational communication and its antecedents as the organisations handle activities with other organisations. A contact person (human resource manager [HR]) within each humanitarian organisation was identified who helped the researcher to co-ordinate the completion of the questionnaires and sending them back directly to the research team using a sealed envelope. Sometimes, however, the HR requested the researcher to pick up the filled questionnaire from the head office of the respective humanitarian organisation. In return for participation, the humanitarian organisations were given a report but no other/monetary incentives were offered for participation in the study.

After data was collected, we checked the returned instruments for careless scoring, inaccurate responses and missing instruments. Thereafter, the raw data was captured into the Statistical Package for Social Scientist data analysis programme (SPSS version 25) and screened for incorrect data entry, out-of-range values (outliers), missing values and normality as recommended by Hair et al. (2018). Tests for outliers were performed using box plots, whilst missing values in our data was determined by running frequencies for each of the items in our questionnaire. To ascertain whether our data was normally distributed, tests for normality were run using a histogram and normal p-p plots. Besides, tests on the assumption of parametric data of homogeneity were also determined using Levene's test as recommended by Field (2018). The test for outliers revealed that none existed in our data, whilst the test for normality indicated that the histogram was bell-shaped and the normal p-p plots had most observed values falling along the straight

line. Results from Levene's test to determine homogeneity revealed that all variables that showed in Levene's test were non-significant at $p = 0.05$ and the variances were stable at all levels.

Non-response bias test

According to Podsakoff et al. (2012), non-response bias occurs when the researcher is unsuccessful in obtaining information from the sampling units selected for the sample. To overcome this, both procedural and statistical remedies were adopted to alleviate any likely non-response bias problems (Cheung et al. 2017). Regarding the procedural remedies, we explained the importance of the study to the respondents, formally wrote to each invited respondent and sought approval for the study from each humanitarian organisation that participated. Statistically, we compared respondents and non-respondents using the Mann-Whitney U tests on study variables. The results in Table 1 indicate that there is a statistically significant difference between the two groups of respondents on all constructs under study, meaning that non-response bias was likely to affect our findings and the conclusions reached.

Common method bias

The fact that this study utilised data obtained using cross-sectional design raises concerns about common method bias (CMB) (Lindell and Whitney 2001). This was solved by effective questionnaire development, where items were adapted from previously published work, guaranteed respondents' confidentiality and minimised item ambiguity through pre-tests and interviews with senior academics and relief response managers. We also used the proximal separation and randomised sequence of the predictor and criterion variable items in the questionnaire (Podsakoff et al. 2003). In addition, we applied the following statistical methods: (1) Harman's single factor test (Harman 1967), whereby all research variable items were entered into a component factor analysis. The results indicated that a single factor solution does not emerge, since the maximum covariance explained by one factor is only 33.80%, which is below the 50% threshold value, suggesting that common method bias is unlikely

to affect our findings and conclusions. (2) The Kock 2015 method for testing for CMB, which is appropriate and highly recommended in PL-SEM. This involves comparing the variation inflation factor (VIF) for the lateral and vertical relationship in the study structural model, where the threshold is that each relationship VIF should be below 3.3 to rule out common method bias. The results in Table 2 reveal that all the VIF values for both the lateral and vertical relationships in the structural model are below the value of 3.3, as Kock recommends.

Measurement validation

Before assessing the structural model, measurement models were evaluated in terms of convergent validity, internal consistency, reliability and discriminant validity. The results in Table 3 reveal that convergent validity, which is the degree to which a measure correlates well with alternative measures of the same variable, is assessed by outer loadings of the manifest items and the average variance extracted from each reflectively measured construct is substantial and significantly relevant. The indicator loadings were all above 0.70 and the average variance was extracted above 0.50 for each construct as recommended by Diamantopoulos et al. (2012), suggesting that each indicator accounted for more than 50% of the variance of the underlying construct. Also, item loadings of greater than 0.70 were obtained, demonstrating acceptable manifest reliability. Finally, to assess the extent to which the item can be used repeatedly and yield consistent results (construct reliability) was assessed in terms of Cronbach's (1951) alpha coefficient and composite reliability. The results indicate that Cronbach's alpha coefficient and composite reliability scores for all study constructs were above the required minimum of 0.70, meaning that internal consistency was also established (Kline 1999).

Discriminant validity

To establish whether the independent constructs differently predicted the dependent variable, we used the Fornell-Lacker criterion (Fornell and Larcker 1981), the heterotrait-monotrait (HTMT) ratio and cross loading (Henseler et al. 2015). The results presented in Table 4 reveal that the Fornell-Lacker and the HTMT ratios for

Table 1 Non-response bias test

	IOCOMM	IOGPM	ORGFUORIENT	INTERQUAL
Mann-Whitney U	360.000	399.500	324.500	390.500
Wilcoxon W	825.000	864.500	789.500	855.500
Z	-.737	-.089	-1.315	-.234
Asymp. Sig. (2-tailed)	.461	.929	.189	.815

Grouping variable: category of humanitarian organisation

Table 2 Common method variance

Study constructs	1	2	3	4
Organisational future orientation (1)		1.571	1.707	1.669
Inter-organisational group mechanism (2)	2.194		2.044	2.218
Inter-organisational interaction quality (3)	1.814	1.520		1.859
Inter-organisational communication (4)	1.695	1.605	1.797	

Table 3 Measurement model results

Constructs	Items	VIF	Standardised item loading	Item reliability	Cronbach's alpha	rho_A	Composite reliability	Average variance extracted (AVE)
Inter-organisational group mechanism	AMGP4	1.814	0.821	0.674	.799	.799	.869	.624
	AMGP5	1.642	0.777	0.604				
	AMGP6	1.508	0.768	0.590				
	AMGP7	1.616	0.792	0.627				
Inter-organisational communication	COCM1	1.767	0.822	0.676	.748	.757	.858	.669
	COCM2	2.052	0.89	0.792				
	COCM5	1.319	0.734	0.539				
Interaction quality	INNFO2	1.593	0.783	0.613	.839	.844	.886	.608
	INNFO3	1.742	0.853	0.728				
	INNFO5	1.225	0.748	0.560				
Organisational future orientation	NTNT12	2.076	0.794	0.630	.709	.711	.838	.633
	NTNT13	2.213	0.825	0.681				
	NTNT14	1.643	0.729	0.531				
	NTNT3	1.684	0.739	0.546				
	NTNT9	1.826	0.809	0.654				

Table 4 Discriminant validity results: Fornell-Larcker criterion and heterotrait-monotrait ratio (HTMT)

Study variables	Fornell-Larcker criterion				Heterotrait-monotrait ratio (HTMT)			
	1	2	3	4	1	2	3	4
Organisational future orientation (1)	.796							
Inter-organisational interaction quality (2)	.51 ^a	.780			.651			
Inter-organisational group mechanism (3)	.62 ^a	.67 ^a	.790		.818	.808		
Inter-organisational communication (4)	.55 ^a	.52 ^a	.62 ^a	.818	.746	.651	.83	

^a Correlation is significant at the 0.01 level (2-tailed)

the main latent criteria were satisfied. The square root of the average variance extracted for each of the study variables is higher than the inter-construct correlations, whilst all the values of the HTMT for all the study variables are below the recommended threshold value of 0.85 (Henseler et al. 2015). Additionally, the cross-loading results in Table 5 show that the items load higher on their intended constructs than on the rest, indicating that all constructs in the model discriminate well. Therefore, these results support the evaluation of the structural model which test the stated hypotheses among the study constructs.

Testing for endogeneity bias

Since our study also tested a set of prescribed hypotheses, we were obliged to account for endogeneity (Basu 2020; Rutz and Watson 2019) that could arise from the omitted variable in the PLS path model. Following Hult et al.'s (2018) guidelines, we applied Park and Gupta's (2012) Gaussian copula approach, using the lower-order construct scores of the pooled sample as input. The results

reveal that neither of the Gaussian copulas is significant. Specifically, considering the inter-organisational group mechanism aspects as potentially endogenous yields a path coefficient estimates of 0.093, which is not significant (p value = 0.254). Similarly, the organisational future orientation aspects' Gaussian copula has a 0.13 estimate, which is not significant (p value = 0.291). Finally, considering the construct of inter-organisational interaction quality as potentially endogenous yields no significant copulas of 0.042 for the inter-organisational communication aspects (p value = 0.521). Hence, we conclude that endogeneity is not present, which supports the PLS-SEM results' robustness (Hult et al. 2018).

Testing for non-linear effects

In order to establish whether the stated relationships have a non-linear effect on the predictive outcome of inter-organisational communication, we introduced the quadratic effect of all the predecessor variables into the model with the assumption that a positive effect

Table 5 Cross loadings

	Inter-organisational group mechanism	Inter-organisational communication	Interaction quality	Organisational future orientation
AMGP4	0.821	0.477	0.510	0.561
AMGP5	0.777	0.494	0.521	0.447
AMGP6	0.768	0.520	0.605	0.423
AMGP7	0.792	0.519	0.466	0.524
COCM1	0.481	0.822	0.377	0.527
COCM2	0.583	0.890	0.432	0.457
COCM5	0.493	0.734	0.479	0.355
INNFO2	0.443	0.386	0.376	0.783
INNFO3	0.520	0.441	0.395	0.853
INNFO5	0.506	0.471	0.439	0.748
NTNT12	0.469	0.341	0.794	0.371
NTNT13	0.546	0.362	0.825	0.360
NTNT14	0.480	0.396	0.729	0.311
NTNT3	0.504	0.404	0.739	0.445
NTNT9	0.582	0.510	0.809	0.478

of OFO, IOGM and IQ on IOCOMM diminishes as their levels increase. We evaluated whether the non-linear effects are significant by using the 95% bootstrap confidence intervals. For their significant non-linear effects, we assessed their relevance based on their f^2 effects size, where outcomes higher than 0.005, 0.01 and 0.025 constitute small, medium and large f^2 effect sizes (Kenny and Judd 2019). The results in Table 6 reveal that the quadratic effects of OFO, IOGM and IQ have f^2 effects sizes of .081, .006 and .004 respectively, since the value f^2 effect size for OFO is .081 above the upper limit of .025, which, according to Kenny (2018), would at maximum represent a large effect size. In addition, the value effect size of .006 for IOGM represents a small effect size and has an f^2 effect size of .006, whilst an effect size value of .004 for IQ suggests a non-quadratic effect of IQ on IOCOMM, as the effect size is below the lower limit of .005, basing on Kenny's (2018) recommendation.

Table 6 Non-linearity effect results

Direct Path Coefficients	f^2	β	P	Bias-corrected bootstrap confidence interval
OFO ²	.081	.148	.006	0.054-0.257
IOGM ²	.006	.045	.502	-0.082-0.178
IQ ²	.004	.044	.516	-0.078-0.185

Key: OFO is organisational future orientation, IOGM is inter-organisational group mechanism, IQ is interaction quality

Analytical procedure for the structural model

We conducted statistical analyses using partial least squares structural equation modelling (PLS-SEM) in the SmartPLS 3.3.0 version to establish the hypothesised relationships. This is because PLS-SEM allows modelling of complex models with small samples even where theoretical support is not well substantiated, and accommodates modelling of both reflective and formative measurement models as well as the conceptualisation of lower-order models (Hair et al. 2012; Wetzels et al. 2009). Preceding hypothesis testing, multicollinearity was assessed using variance inflation factor (VIF) for the study constructs in the structural model and the predictive potential of the model using (R^2) and the relevance of the model using Stone-Geisser (Q^2), which indicates that the empirical data reconstructed the theoretical model in a substantive way, as recommended by Hair et al. (2018). The assessment of relationship significance in the model was done through a complete bootstrap procedure (with 5000 samples, with no sign changes option, and through a two-tailed test at 5% level of significance, extracting the bias-corrected and accelerated confidence interval (BCa CI) values).

Results

Descriptive statistics and inter-construct correlation

The results in Table 7 indicate that the mean and standard deviation scores were in the range of 4.60 and 4.75 and 0.53 to 0.58 for inter-organisational interaction quality, inter-organisational group mechanism,

Table 7 Descriptive and inter-construct correlation

Study variables	Descriptive statistics				Inter-construct correlation			
	Min.	Max.	Mean	Std. dev.	1	2	3	4
Organisational future orientation (1)	1.00	6.00	4.75	0.55	1.00			
Inter-organisational interaction quality (2)	1.00	6.00	4.60	0.54	.51 ^a	1.00		
Inter-organisational group mechanism (3)	1.00	6.00	4.72	0.53	.62 ^a	.67 ^a	1.00	
Inter-organisational communication (4)	1.00	6.00	4.73	0.58	.55 ^a	.52 ^a	.62 ^a	1.00

^a Correlation is significant at the 0.001 level (2-tailed)

inter-organisational communication and organisational future orientation, respectively. Having obtained the mean scores in that range implies that all the variables are practicable and are existent within the humanitarian organisations that participated in this study. Furthermore, standard deviation values for the study variables are close to zero, indicating that the study sample is likely to be an accurate reflection of the population and that the participants in this study may have had a close or similar understanding of the study variables. In addition, the results reveal that there is a significant positive association between inter-organisational interaction quality, inter-organisational group mechanism, inter-organisational communication and organisational future orientation. Establishing a significant and positive correlation among the study variables enabled us to proceed to the testing of hypotheses, as is required.

Humanitarian organisations' characteristics

The sample characteristics are shown in Table 8. The age of the organisation varied between 1 and 15 years; the number of employees varied between 1 and over 100. Overall, 27 of the participating humanitarian organisations were small with fewer than 50 employees, 42 were medium-sized with between 50 and 100 employees, whilst 22 had over 100 employees. Additionally, 30 humanitarian organisations were development-oriented NGOs, 28 fell in the service delivery category, 37 were professional and advocacy NGOs, and six were governmental organisations. In terms of location, 48 were

operating in northern and 43 were operating in the central region of Uganda. The results indicate that these organisations need to communicate with one another for timely relief response.

Individual respondents' characteristics

The results in Table 9 regarding individual respondents within these humanitarian organisations reported 52.4% male and 47.6% female respondents. The results further show that the majority of respondents in the total sample were aged between 34 and 45 (41.6%) and had worked with their organisations for 4–6 years (44.2%). The highest educational qualification among the respondents was a university degree, at 62.9%. Among the sample respondents, 32.7 to 32.3% were programme and project managers, respectively, which indicated that they were knowledgeable about inter-organisational co-ordination.

Direct hypotheses

The results in Table 10 below from the bootstrapping with 5000 samples using the no sign significant option show that most of the path coefficients are statistically significant ($p < 0.05$). Inter-organisational group mechanism and inter-organisational communication is 0.405 ($P = 0.003$, with lower and upper boundaries of the 95th BCa CI values of 0.128 and 0.661, respectively). Interaction quality and inter-organisational group mechanism is 0.474 ($p = 0.000$, with lower and upper boundaries of the 95th BCa CI values of 0.250 and 0.666, respectively). Organisational future orientation

Table 8 Humanitarian organisations characteristics

Sector	F	%	Age of org.	F	%	No. of staff	F	%	Location			
Service delivery NGO	28	27.7	1-5	5	5	1-25	20	19.8	Central	43	42.5	
Development-oriented NGO	30	29.7	6-10	16	15.8	26-50	17	16.8	Northern	48	47.5	
Professional NGO	9	8.9	11-15	19	18.8	51-75	24	23.8	Western	10	10	
Advocacy NGO	28	27.7	> 15	61	60.4	76-100	18	17.8	Total	101	100	
Government department	6	6				> 100	22	21.8				
Total	101	100	Total	101	100	Total	101	100				

Source: Analysis of quantitative data

Table 9 The individual respondent characteristics

Characteristics		F	%	Characteristics		F	%
Gender	Male	165	52.4	Position	Programme	103	32.7
	Female	150	47.6		Projects	102	32.3
Age bracket	< 33	82	26		Response	26	8.3
	34-45	131	41.6		Logistics co-ordinator	84	26.7
	46-55	84	26.7		Total	315	100.0
	56-64	17	5.4	Respondents' years of operation	3 Jan.	124	39.4
	> 65	1	0.3		6 Apr.	139	44.2
Qualification	Diploma	47	15		9 Jul.	38	12.1
	Degree	198	62.9		10 and above	14	4.4
	Master's	70	22.2		Total	315	100.0
Total		315	100.0				

Source: Analysis of quantitative data

Table 10 Direct hypothesis results

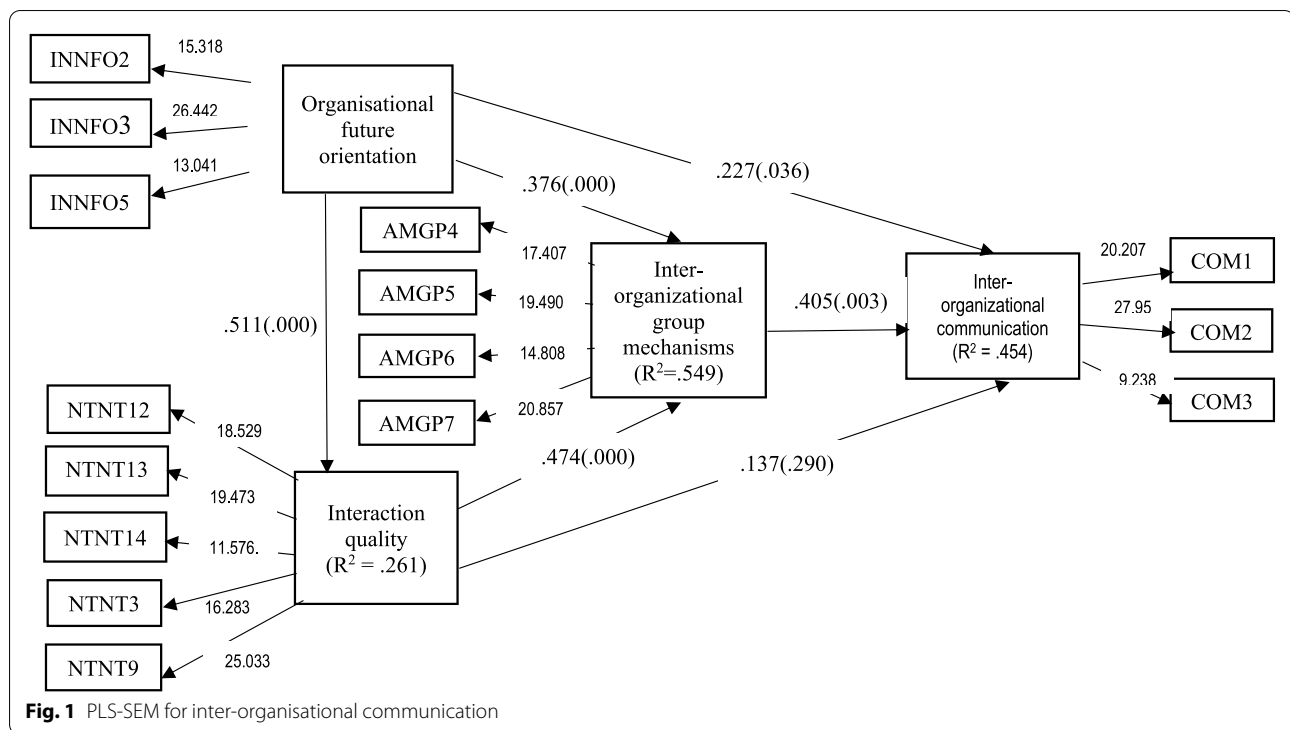
Path coefficients	f^2	VIF	β	δ	Z value	p values	Confidence intervals bias corrected
Inter-organisational group mechanism -> inter-organisational communication	.135	2.217	0.405	0.138	2.942	0.003	0.128, 0.661
Interaction quality -> inter-organisational group mechanism	.370	1.354	0.474	0.104	4.564	0.000	0.250, 0.666
Interaction quality -> inter-organisational communication	.019	1.852	0.137	0.130	1.059	0.290	−0.118, 0.385
Organisational future orientation -> inter-organisational group mechanism	.234	1.354	0.376	0.108	3.495	0.000	0.165, 0.581
Organisational future orientation -> inter-organisational communication	.057	1.668	0.227	0.108	2.098	0.036	0.006, 0.432
Organisational future orientation -> interaction quality		1.000	0.511	0.082	6.226	0.000	0.317, 0.646
R square	R^2	Adj R^2					
Inter-organisational group mechanism	0.550	0.540					
Inter-organisational communication	0.454	0.437					

and inter-organisational group mechanism is 0.376 ($p = 0.000$, with lower and upper boundaries of the 95th BCa CI values of 0.165 and 0.581, respectively). Organisational future orientation and inter-organisational communication is 0.227 ($p = 0.036$, with lower and upper boundaries of the 95th BCa CI values of 0.006 and 0.432, respectively). Organisational future orientation and interaction quality is 0.511 ($p = 0.000$, with lower and upper boundaries of the 95th BCa CI values of 0.317 and 0.646, respectively). Specifically, only the path relationship interaction quality and inter-organisational communication are not significant $\beta = 0.137$ ($p = 0.290$, with lower and upper boundaries of the 95th BCa CI values of −0.118 and 0.385, respectively). Table 10 and Fig. 1 below show the results of the structural model assessment (e.g., Sarstedt et al. 2017a). With R^2 values of approximately 0.454 for inter-organisational communication and 0.550 for inter-organisational group mechanism aspects, our analysis supports the model's in-sample model fit. Finally, we assessed the model's predictive relevance by running a blindfolding procedure with an omission distance of

seven. All the resulting cross-validated redundancy values (Q2) are 0.277 for inter-organisational communication, 0.319 for inter-organisational group mechanism and 0.149 for inter-organisational interaction quality, further supporting the model's predictive accuracy.

Mediation results

Following Cepeda-Carrión et al. (2017) recommendation, we also ran a mediation analysis. Analysing the indirect effect between these organisational future orientation and inter-organisational communication constructs via the inter-organisational group mechanism yields a significant ($p = 0.004$; 95% BCa confidence interval: [0.067–0.281]) indirect effect of 0.152, whilst the direct effect is significant. In line with Zhao et al.'s (2010) findings, this result indicates a partial (complementary) mediation, suggesting that another construct, which is not part of the model, may also serve as a mediator in the relationship between organisational future orientation and inter-organisational communication. Furthermore, this result indicates a partial (complementary) mediation



indirect effect between the organisational future orientation and inter-organisation group mechanism constructs via inter-organisational interaction quality, yielding a significant ($p = 0.001$ BCa confidence interval: [0.117-0.393]) indirect effect of 0.242, whilst the direct effect is significant. Finally, the results reveal a significant full mediation effect (indirect only) of inter-organisational group mechanism in the relationship between inter-organisational interaction quality and inter-organisational communication ($p = 0.041$ BCa confidence interval: [0.043-0.404]) indirect effect of 0.192, whilst the direct effect is insignificant (see results in Table 11 and Fig. 1). In line with Zhao et al.'s (2010) findings, this result indicates that inter-organisational group mechanism fully acts as conduit through which interaction quality relates with inter-organisational communication.

Discussion of results and conclusions

Discussion of results

Our study provides empirical insights into the joint direct and indirect effects between organisational future orientation, interaction quality, inter-organisational group mechanism and inter-organisational communication. We find that organisational future orientation and inter-organisational group mechanism have a significant effect on inter-organisational communication but inter-organisational interaction quality has no direct effect on inter-organisational communication. Further analysis of

the indirect effect of organisational future orientation and inter-organisational interaction quality by means of inter-organisational group mechanism discloses significant complementary and indirect effects (Zhao et al. 2010). We find that, as such, our study provides insights into the 'mechanism of inter-organisational communication', as coined by Thuesen (2018) and Prasanna and Haavisto (2018), which underpins the study findings.

This study finds a significant relationship between organisational future orientation and inter-organisational communication. This implies that the temporal perspective of a humanitarian organisation's preparedness for future operational change and positioning in the light of such change can enable it to create structures, forms and processes that enable it to exchange information and co-create meaning with fellow operating organisations and other stakeholders. This is because organisational future orientation allows the organisation to build itself through a set of practices that permit the identification and interpretation of changes in the environment and to drive adequate actions to ensure long-term survival and success. The findings of this study suggest that when humanitarian organisations share a realistic vision and goals, welcome new opportunities and willingly share and exchange information with other relief organisations, and that this leads to improved relief operations. This is because once they have a shared realistic vision about future relief operations, the organisations are able

Table 11 Mediation test results

	β	μ	δ	Z value	P values	Confidence intervals bias corrected
Direct hypothesis						
Inter-organisational group mechanism -> inter-organisational communication	0.405	0.405	0.138	2.942	0.003	0.128-0.661
Interaction quality -> inter-organisational group mechanism	0.474	0.482	0.104	4.564	0.000	0.250-0.666
Interaction quality -> inter-organisational communication	0.137	0.133	0.130	1.059	0.290	-0.118-0.385
Organisational future orientation -> inter-organisational group mechanism	0.376	0.370	0.108	3.495	0.000	0.165-0.581
Organisational future orientation -> inter-organisational communication	0.227	0.238	0.108	2.098	0.036	0.006-0.432
Organisational future orientation -> interaction quality	0.511	0.519	0.082	6.226	0.000	0.317-0.646
Indirect effect						
Organisational future orientation -> interaction quality -> inter-organisational group mechanism	0.242	0.251	0.072	3.385	0.001	0.117-0.393
Interaction quality -> inter-organisational group mechanism -> inter-organisational communication	0.192	0.202	0.094	2.043	0.041	0.043-0.404
Organisational future orientation -> inter-organisational group mechanism -> inter-organisational communication	0.152	0.143	0.053	2.847	0.004	0.067-0.281
Total Effect						
Inter-organisational group mechanism -> inter-organisational communication	0.405	0.405	0.138	2.942	0.003	0.128-0.661
Interaction quality -> inter-organisational group mechanism	0.474	0.482	0.104	4.564	0.000	0.250-0.666
Interaction quality -> inter-organisational communication	0.329	0.335	0.114	2.896	0.004	0.093-0.535
Organisational future orientation -> inter-organisational group mechanism	0.619	0.622	0.070	8.820	0.000	0.444-0.734
Organisational future orientation -> inter-organisational communication	0.548	0.553	0.084	6.521	0.000	0.348-0.688
Organisational future orientation -> interaction quality	0.581	0.519	0.082	6.226	0.000	0.317-0.646

to share and exchange accurate information about the needs of the victims, the resources needed and the location of victims. In addition, they engage in strategic planning processes, are committed to the common welfare of the community and work with the most vulnerable people since they are aware of the challenges and opportunities inherent in the environment. All this helps them to mitigate operational risks like late delivery and conflicts, and also to attract resources from donors to sustain their operations. This finding is in line with Shumate et al.'s (2016) and Paulraj et al.'s (2008), which show a relationship between organisations' long-term orientation and inter-organisational communication. The finding indicates that such an orientation enables the communication and exchange of information and knowledge, lowers transaction costs and enhances transaction value through strategic collaboration. The above study finding is supported by the Complex Adaptive Systems (CAS) theory which argues that, future-oriented organisation survive in a complex operating environment create ties with other organisation for sharing information related to their operations.

Second, the results reveal that organisational future orientation is significantly related to inter-organisational group mechanism. This means that the temporal perspective of humanitarian organisations' preparedness for

future operational change and positioning in the light of such change can allow the establishment and arrangement of clear ways of working together and of getting things done. This is so because organisational future orientation leverages an organisation's foresight methods and utilises its foresight processes, thus promoting practices that permit the organisation to probe into future operations. It was revealed that humanitarian organisations that are future oriented use group mechanisms like holding staff meetings and bringing groups together at the start of any relief activity to discuss relief-related matters, evaluate the quality of relief and solve problems, meet minimum relief core standards so that they are recognised and endorsed even for future relief activities. Furthermore, the relationship implies that humanitarian organisations that willingly welcome opportunities to take part in new relief operations will strive to be represented in all formal sessions that make mutual adjustments about relief activities. The reason is that when they attend both scheduled and unscheduled inter-humanitarian organisation meetings that co-ordinate relief activities, they secure information about partners that share the same vision and are able to work with them, attract strategic resources, strengthen their own long-term survival and attain sustainable success. The existing literature further supports the relationship. Lee et al. (2006)

established that organisations that are future oriented usually create strategic goals and invest resources in planning for the future. However, in order for Lee et al. (2006) to come up with such a conclusion, they studied Chinese manufacturing firms that were profit-oriented and yet this study examined non-profit organisations (NPOs) that deliver relief aid to refugees in camps. In this study, we advance that being future oriented is important in improving an organisation's group mechanism for co-ordinating its activities if it is to remain competitive and sustain its operations. This find lends support to CAS theory which stipulate that an organisation that is future oriented creates its own plans to achieve the future goals (Lewin et al. 1998).

This study results also disclose that inter-organisational group mechanism is related to inter-organisational communication. This implies that an organisation where adjustments to relief activities are made collectively is likely to communicate with other organisations. This is true because making mutual adjustments to relief activities enhances information exchange, which helps to bring about role clarity and collective responsibility for the task decisions taken. In the context of the study, a group mechanism is when sectoral members meet to discuss the relief operations, like the water, sanitation and hygiene (WASH) project carried out at the onset of relief operations in West Nile. This was intended to allocate operational zones in Bidibidi settlement, which helped both working and operating partners to share roles and create cohesion among themselves to be able to serve every victim efficiently. This study finding reinforces the views of previous scholars, Dietrich et al. (2013), who note that formal and informal group meetings, such as status review meetings, quality approval meetings and integration meetings, aid the exchange of knowledge and information between project teams. This contrasts with the works of Brown (1999), which challenge the conception of a formal group mechanism basing on the belief that it is not more effective for achieving cross-unit co-ordination outcomes than an integrator role mechanism. This study reveals that in humanitarian organisations, the use of formal group mechanisms like group meetings, bringing groups together for problem-solving and holding meetings to discuss and share roles and responsibilities is essential to sharing and exchanging accurate information promptly and frequently during relief delivery.

When we explore the effect of inter-organisational group mechanism and organisational future orientation on inter-organisational communication, we observe a complementary effect of inter-organisational group mechanism on the relationship between organisational future orientation and inter-organisational

communication (accounting for 27.74%). This means that organisational future orientation can be directly related to inter-organisational communication but also goes through the inter-organisational group mechanism. This implies that the inter-organisational group mechanism partially acts as a conduit through which organisational future orientation affects inter-organisational communication in terms of sharing and exchange of information accurately, punctually and frequently. This confirms that holding staff meetings and bringing groups together for problem-solving in an effort to implement an organisation's activities are likely to lead to the organisation sharing its vision with those stakeholders in a more realistic way. This facilitates the sharing and exchange of information, hence enables the timely performance of the organisation's mandate. When applied to the context of this study, such a finding implies that humanitarian organisations that demonstrated the possession of operational policies and guidelines also routinely shared their vision and mission with all their stakeholders such as their staff, the government and other working and operating partner NGOs. This subsequently enabled them to deliver their mandate as planned. A case in point is when staff from one humanitarian organisation which delivers nutrition services to beneficiaries revealed that their nutrition service delivery plans required them to interact continually with one another and other implementing partners during work and even after work. The essence of such interactions is to enable the staff to share information so as to understand and prepare for the work to be carried out next so as to deliver their services to beneficiaries in time. This find is in tandem with CAS theory which advance that different organisations react differently to what they have to respond in order for them to maintenance their boundaries (Lewin et al. 1998).

In line with the basic logic of human action (Segeberg et al. 2009), this study finds that the latent variable of organisational future orientation significantly affects inter-organisational interactional quality. This view finds support in Kauffman's (1993) complex adaptive theory, which suggests that organisations that are future oriented increase their level of interaction with other organisations as way of building strategies that permit them to engage with external stakeholders and inspire collaborative action through sharing and discussing their expectations and experience in disaster response, to respond to the requests and to appreciate what other relief organisations offer during relief operations. This means that the observed composite variables of "an organisation having a realistic vision for all the future responses", "effectively ensures that it shares the same vision of the future" and "ensures that the vision for the future is achievable" significantly affect the interaction quality of organisations.

A humanitarian organisation that shares the same vision with other relief organisations will appreciate and respond to the relief organisations' requests, and will always encourage the sharing of experience in disaster relief, which will boost the organisations' ability to carry out relief delivery efficiently and effectively. This is consistent with L'Hermitte et al.'s (2016) revelation that the benefits derived from working with other operating partners, discussing their relief operation expectations and appreciating and responding to their requests are essential determinants of interaction quality.

This study discovers that there is an indirect effect of organisational future orientation on inter-organisational group mechanism that is partially mediated by inter-organisational interaction quality. Also, the study results indicate that interaction quality can help organisational future orientation, leading to a better inter-organisational group mechanism. This implies that the features of complex adaptive systems can well result in the adoption of a better inter-organisational group mechanism for the co-ordination of relief delivery. In this respect, even though organisational future orientation and inter-organisational group mechanism are directly related, the effect of interaction quality on inter-organisational group mechanism might as well be indirect, implying that it could be mediated by inter-organisational interaction quality. This indirect effect of organisational future orientation through inter-organisational interaction quality accounted for 23.44% variance in inter-organisational group mechanism. This is supported in part by Villena et al. (2019) and Kożuch and Sienkiewicz-Małyjurek (2016), who reveal that an effective relief delivery group mechanism emerges from continuous interactions of future-oriented organisations.

Initially, it was assumed that previous and existing interaction quality between the operating organisations is the main source of and basis for sharing rich information among the organisations about one another or the activities they are engaged in. However, the results reveal that there is a non-significant positive relationship between inter-organisational interaction quality and inter-organisational communication. This suggests that spending a lot of time interacting with other relief organisations is not likely to bring about timely and frequent sharing and exchange of rich and accurate information among operating partners, which is necessary to enable them to manage relief-related activities. Some of the plausible reasons for such realities include the continuous fear by the dominant humanitarian organisations to lose their supremacy as the information shared may be mismanaged. Also, small humanitarian organisations continue to avoid the possibility of collaborative work and only settle for association with those that are already big and powerful

for fear of the inevitable loss of their identity. This finding has been corroborated by the studies by Kożuch and Sienkiewicz-Małyjurek (2016), Moutziz (2014) and Reddy et al. (2009), who note that challenges related to information mismanagement, resource allocation issues and ineffective communication can lead to communication and, consequently, co-ordination breakdowns. Also, earlier on Bengtsson and Kock (2000) had noted that interaction among organisations may consist of collaborative and competitive patterns that emerge as a result of business activities being conducted. Therefore, to ensure the efficacy of relief organisation action and to streamline communication as well as co-ordination processes, certain factors are proposed that can enable the organisations to work in association with one another. For instance, there is a need for an inter-organisational formal group mechanism that would spell out how the existing linkages would culminate in enhanced collaborative work. In addition, there is need to establish prominent umbrella organisations that bring together collaborating humanitarian organisations. Ultimately, this would allay the fears associated with loss of supremacy and identity. This finding adds to the CAS theory which emphasises that interacting partners follow simple rules within their local and global environments and alter the environment they respond to by virtue of their simple rules (Sherman & Schultz 1998).

The results suggest that inter-organisational interaction quality relates to inter-organisational group mechanism. This implies that an organisation that shares information and other resources with others, just as others do to it, is likely to establish a formal group that regulates such a valued behaviour. This is because reciprocal interactions enable an organisation to share with others, which helps it to benchmark and develop its own system to guide its activities. In the context of this study, this finding implies that an organisation which discusses its expectations with others in a way shares its experience in undertaking its work by always holding meetings before it begins to implement its activities. This is because through such interactions, better ways are suggested and subsequently adopted. To contextualise this finding, in emergency relief operations by humanitarian organisations, there is a forum chaired by UNHCR where country and humanitarian response directors for each implementing and working partner regularly meet once a month and discuss progress, outstanding activities along with their challenges and the areas in which they need other humanitarian organisations to bridge the funding gap. In these meetings, also, each organisation puts forward its expectations in participating in such relief operations. For example, in Rhino settlement in Arua District, Medical Team

International (MTI) had a funding gap which could not allow it to provide health services in all the existing zones and in the new ones, such as Omugo. This enabled Save the Children to raise money through its donor and to start providing health services in Omugo zone upon obtaining approval from the Ministry of Health. This funding helped MTI to upgrade Omugo health centre II to health centre IV, and also to buy an ambulance for the centre to enable handling of the expanding health humanitarian needs. This view is supported by Delmas et al. (2019) and Ponisio et al. (2017), who explain that interacting agents come up with guiding principles to ensure that opportunistic attachment and topological plasticity cannot move the system away from predictions based on power laws. Based on their findings, they propose that group mechanisms that determine organisations' interactions can be identified within a cohesive framework regardless of the type of organisational interaction.

The study established the existence of a full mediation effect of the inter-organisational group mechanism in the relationship between inter-organisational interaction quality and inter-organisational communication. This means that the inter-organisational group mechanism fully acts as a conduit through which inter-organisational interaction quality affects inter-organisational communication. An organisation that holds meetings at the start of any formal activities is able to devise ways and means through which to contact other organisations for assistance so as to deliver on their mandate. In other words, formal meetings provide an opportunity for the exchange of meaningful ideas, such as those regarding the possible funders in a bid for an organisation to secure assistance to deliver as expected. For instance, it was observed that humanitarian organisations hold meetings with the various stakeholders or implementing partners before the beginning of any relief activities. During these meetings they share information regarding their operations and challenges and make suggestions for possible continuity. In so doing, they secure opportunities that facilitate a commitment to their mandate. This indirect effect of inter-organisational interaction quality through inter-organisational group mechanism accounted for 58.35% variance in inter-organisational communication. This finding corroborates those of Kożuch and Sienkiewicz-Małyjurek (2016), who argue that information exchange among interacting organisations depends to a large extent on the organisational and interactive conditions which occur between collaborating organisations. These include, among others, communication in inter-organisational working teams and professional communication between personnel from individual organisations.

Chetty and Agndal (2008) established that, those coordinating organisations create activity links in such a way that lasting relationships that both benefit and constrain organisations evolve.

Conclusions

Drawing on our research, which provided insights into the factors influencing communication among humanitarian organisations, we conclude that these factors are organisational future orientation, interaction quality and inter-organisational group mechanisms. We also conclude that organisational future orientation has both direct and indirect effects through inter-organisational group mechanism on inter-organisational communication. However, this study established that interaction quality only goes through inter-organisational group mechanism to relate to inter-organisational communication.

Implications

The results we have obtained allow us to suggest the existence of several implications for both managers and practice. First, our finding encourages humanitarian organisations to be future oriented, and being part of the inter-organisational group mechanism with other agents in their network during relief delivery is essential for the development of better inter-organisational communication behaviour. This is specifically important with regard to interacting with one another during relief operations. In this respect, sharing feedback and information regarding needs assessments is particularly important in improving inter-organisational communication, and organisations seem to be more willing to share feedback and information than aid stocks or other supplies. There are various group mechanisms that future-oriented humanitarian organisation can use to facilitate inter-organisational communication, such as virtual pooling models, taskforces, standing and steering committees, knowledge-sharing, and inter-agency or cluster meetings. However, organisations should be aware of environmental and organisational barriers that may affect the adoption of these mechanisms, such as spillover effects, resistance to change, turf protection, cross-training of employees, or costs of developing standard interfaces or modular resources (Pazirandeh and Maghsoudi 2018).

Limitations and areas for future research

A number of limitations in this study need to be noted. First, our results are limited to the methodology used. The subjective nature of the survey data specifically impacted the measurement of study variables. Second, we measured inter-organisational interaction quality, group mechanism and communication at an organisational

level. Although we tried to capture the notion of the three constructs within the context of horizontal network interactions from the perspective of a focal organisation, these constructs actually exist in the relations between and among all organisational ties. Thus, according to Bernardes (2010), these constructs should ideally be measured among either dyadic ties or organisations co-ordinating in specific clusters. We instead studied humanitarian organisations that were actively delivering relief in the settlements in Uganda. Whilst some of these organisations commonly work in the same cluster during different relief operations, some might not even know of the other NGOs. By including a sufficiently experienced respondent from each organisation, we hoped to reveal the nature or quality of interaction, organisational future orientation, and group mechanism. Further studies may attempt to measure these constructs at a network (i.e. cluster) level and in between organisational ties. Additionally, we measured inter-organisational communication based on the metrics that we found suitable for humanitarian operations. However, humanitarian organisations have differing methods of data collection and measuring inter-organisational communication, and information is also not always accurately collected or disseminated within organisations. Future studies may investigate the extent to which the accuracy of information impacts the willingness to share or co-ordinate in further operations.

Abbreviations

B: Beta coefficient; BCa CI: Bias-corrected and accelerated confidence interval; CAS: Complexity adaptive Systems Theory; CMB: Common method bias; HOs: Humanitarian organisation; HTMT: Heterotrait-monotrait; HR: Human resource manager; IOCOMM: Inter-organisational communication; IOGM: Inter-organisational group mechanism; IQ: Interaction quality; NGOs: Non-governmental organisation; OFO: Organisational future orientation; OPM: Office of the Prime Minister; PLS-SEM: Partial Least Square Structural Equation Modelling; SPSS: Statistical Package for Social Scientist; VIF: Variance inflation factor; μ : Mean; δ : Standard deviation.

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Authors' contributions

HM conceptualised the study, reviewed literature, wrote the manuscript, collected, analysed and interpreted the data and in writing the manuscript. MM guided on the global debates of inter-organisational communication in humanitarian relief delivery and conceptualization of the study. JMN guided the theoretical debate, conceptualization and logical flow of the study. JCM guided the theoretical debate and logical flow of the study. All Authors were involved in the preparation of the manuscript. The authors read and approved the final manuscript.

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Declarations

Competing interests

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