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Technology-enhanced focus groups as a component of instrument development

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Abstract

Background—Bullying is a critical public health problem and a screening tool for use in healthcare is needed. Focus groups are a common tool for generating qualitative data when developing an instrument and evidence suggests that technology-enhanced focus groups can be effective in simultaneously engaging participants from diverse settings.

Aim—To examine the use of technology-enhanced focus groups in generating an item pool to develop a youth-bullying screening tool.

Discussion—The authors explore methodological and ethical issues related to conducting technology-enhanced focus groups, drawing on their experience in developing a youth-bullying measure. They conducted qualitative focus groups with professionals from the front lines of bullying response and intervention. They describe the experience of conducting technology-enhanced focus group sessions, focusing on the methodological and ethical issues that researchers engaging in similar work may encounter. Challenges associated with this methodology include establishing rapport among participants, privacy concerns and limited non-verbal communication.

Conclusion—The use of technology-enhanced focus groups can be valuable in obtaining rich data from a wide variety of disciplines and contexts. Organising these focus groups was inexpensive and preferred by the study's participants.

Implications for practice—Researchers should consider using technology-enhanced focus groups to generate data to develop health-related measurement tools.

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Introduction

Internet-based communication methods, including email, social media, instant messaging and online meetings are ubiquitous. These technology-based communication systems provide researchers with new ways to conduct qualitative and quantitative research, and offer several benefits for participants and researchers. In qualitative research, they can make participants more comfortable about disclosing sensitive information, give them time to provide more thoughtful responses to queries, offer them a greater sense of control over interviews, improve researchers' access to otherwise closed environments and allow participants from wide geographic regions to participate simultaneously (Mann and Stewart 2000, Egan et al 2006, Heath et al 2009, Ramo and Prochaska 2012, Hayman et al 2012, Child et al 2014, Mason and Ide 2014, Oates 2015). Online meetings can also be easier to schedule because they do not require physical space and can be cheaper to conduct than in-person gatherings (James and Busher 2006).

Internet-based focus groups were adopted by market researchers before they gained popularity in the social sciences in the late 1990s (Murray 1997, Robson 1999, Stewart and Williams 2005). While there are reports available in health and allied literature about the use of online focus groups (Gaiser 1997, Murray 1997, Stewart and Williams 2005, Watson et al 2006, Tates et al 2009, Zwaanswijk and van Dulmen 2014), most describe an asynchronous process, such as the evaluation of email threads, where group dynamics and interaction were limited (Kenny 2005). As group interaction is consistently cited as the characteristic that distinguishes focus groups from other qualitative methods (Nyamathi and Shuler 1990, Kitzinger 1994, Asbury 1995, Krueger and Casey 2015), some have challenged the description of asynchronous formats as focus groups (Kenny 2005). Still other authors have encouraged the exploration of alternative focus group methods, acknowledging that there is no single approach ideally aligned with all research investigations (Mann and Stewart 2000, Krueger and Casey 2015). Thus, there is a need for the description of newly emerging, technology-enhanced, focus group techniques.

Technology-enhanced focus groups are similar to traditional face-to-face focus groups. However, discussions take place in a virtual discussion room in which participants may or may not be able to view other group members and where they can react to comments made by the group moderator and other participants. Participants are logged into the meeting simultaneously, allowing for real-time, direct interactions among the group. Some researchers have used asynchronous technologies to overcome barriers created by differing time zones, so this technique may be useful when simultaneous interaction is inessential (James and Busher 2006).

In addition to other uses, such as exploring a research topic, gathering primary data, generating hypotheses or checking validity, technology-enhanced focus groups can be used to generate pools of items for new health-related measurement tools (Rowan and Wulff

2007, Krueger and Casey 2015). Potential items are often developed using a multi-method, reflective approach which can include reviewing existing instruments that measure the same or similar phenomena, conducting a thorough literature review, discussing with content experts the area being studied, and consulting with people who are likely to experience or who have experienced the phenomenon of interest (Rowan and Wulff 2007). Once an adequate pool of items has been developed, it can be evaluated for content validity, and then field tested and assessed for its psychometric properties. This multifaceted approach helps the researcher to develop meaningful measures that accurately and reliably assess the concept.

This paper examines the use of technology-enhanced focus groups to generate an item pool for a new youth-bullying screening tool. While bullying is a pervasive public health problem, it can be challenging to engage in qualitative research with a diverse group of healthcare and educational professionals who work with bullied young people. Geographic and scheduling challenges are major barriers to participation but they can be alleviated using technology (Tates et al 2009).

Considerations

Software is used to provide the discussion platform in technology-enhanced focus groups, as well as to record the video, audio and typed comments for later transcription and analysis. Examples include GoToMeeting, WebEx and Google+ Hangouts. Through their use, the internet becomes a 'site' for the research (James and Busher 2006).

The platform provides a virtual space for communication allowing for the generation of data created mutually between researchers and participants in partnership through language and common reflection (Prasad 2005, Rubin and Rubin 2012). As a result, technology-enhanced focus groups provide researchers with an efficient and effective method for capturing rich data concerning the concepts of interest.

Technology-enhanced focus groups enable researchers to display additional content for participants, such as consent documents, group ground rules, videos, slides or images. Participants can also type questions or comments for the group moderator or fellow participants. Important considerations include determining group size, whether to use a synchronous or asynchronous format, and whether to use video to communicate.

Sample size

Focus groups are a socially-oriented method of collecting data, assuming an individual's attitudes and beliefs are in part socially constructed (Marshall and Rossman 2011). Through group interactions, participants listen to the others' opinions, generate shared understandings, and form and share their own views. As interaction between participants, including discussion, pauses and conversational lulls, is critical to achieving the research's aims, determining the right number of participants is critical. While face-to-face groups typically consist of 7–12 participants (Marshall and Rossman 2011), technology-enhanced focus groups function ideally with a range of five to seven participants (Mann and Stewart 2000). Mann and Stewart (2000) also noted that having too many participants can create an

environment where the conversation moves too quickly, skimming over topics that may be complex and deserving of additional focus.

In our experience, having fewer than six participants seems to create too many lags in conversation while more than seven can create conversational overlap. Even though a group of six seems ideal, we would recommend obtaining informed consent and a commitment from at least one other volunteer to serve as an ‘alternate’ participant, in case there are any last-minute scheduling conflicts or cancellations.

Synchronous versus asynchronous formats

Technology-enhanced focus groups can be conducted synchronously and asynchronously (James and Busher 2006). Both methods have strengths and limitations, but to establish and maintain rigour in the study, it is important to ensure congruence between the aims of the study and its epistemological and methodological approaches (James and Busher 2006): asynchronous methods can overcome differences in time zones and are aligned with methods that draw on in-depth, narrative accounts; synchronous methods are compatible with studies that require group interaction and socially-based understandings (Mann and Stewart 2000, James and Busher 2006, Stover 2012).

Our study depended on group interaction and the processing of experiences. Therefore, a synchronous methodology was more congruent with our work than one emphasising independent, in-depth reflection.

Audio, video or both?

Video can be useful in maintaining some non-verbal communication cues absent in audio interactions. However, it also presents challenges in terms of maintaining privacy and confidentiality, storing data files, ensuring connectivity and helping introverted personalities feel comfortable enough to fully participate (Orchard and Fullwood 2010).

We chose not to use video in our study because we thought it would improve participants’ privacy, as they would be discussing sensitive issues.

Study methods

Purpose and design

The overarching purpose of the Child-Adolescent Bullying Screen (CABS) study was to develop a screening tool to identify school-age children exposed to bullying. This phase of the study used a qualitative approach to generate an item pool to be used in developing the instrument.

Sample and recruitment

We recruited to participate in two technology-enhanced focus groups a purposive sample of 12 health and education professionals with direct experience of working with young people exposed to bullying. The purpose of the groups was to generate data concerning professionals’ beliefs about and opinions of youth bullying, particularly the definition of

bullying, instruments used to measure bullying and desirable instrument characteristics. Participants were also asked after sessions to provide additional comments about the focus groups.

We initially contacted potential study participants by phone, email or face-to-face, to assess their interest in participating. We informed them of the purpose of the study, the methods and the processes that would follow. Additional contact was subsequently made with those expressing interest in participation (12 of 13 invitees, 92% response rate). None said they had concerns about the privacy or security of the group or declined to participate because of the use of technology. We ensured we made these contacts promptly, to begin building trust with participants. Details of the focus groups, documents to obtain informed consent and contact information were all provided to ensure participants had time to review materials, make informed decisions, and ask any questions that they might have before the groups. Before scheduling the focus groups and in compliance with institutional review board (IRB) requirements, a formal informed consent script was used and two Collaborative Institutional Training Initiative (CITI)-trained study personnel assisted in obtaining consent. Tables 1 and 2 provide inclusion criteria and critical elements of the process of obtaining informed consent.

We recruited a diverse group of practising professionals representing urban and rural locales as well as a range of socioeconomic statuses. Home locations included mid-Atlantic and New England states of the US. Participants were 40 to 60 years old; nine were women. We found that participants, particularly those based further away, favoured the convenience of the technology-based approach; they likely would not have been able to join the group if in-person participation had been required. Several participants had previously been involved with traditional, face-to-face focus groups.

Generating data

Interview guides were developed for use during the focus groups to ensure consistency. Study participants were made aware that conversations were being recorded for later analysis, and their rights and responsibilities were reviewed. Several days before the focus group, we emailed participants a GoToMeeting invitation containing a link, passcode and phone number that would allow them to view a common computer screen and participate in discussion. They were also shown PowerPoint slides containing discussion prompts. To ensure anonymity, participants could not see each other and only first names were used during the discussion.

Each session lasted approximately an hour. Discussions were led by one of us, using a prepared guide for consistency. As in traditional face-to-face focus groups, the role of the moderator was to lead the discussion, pose questions to the group, clarify ambiguities, ensure individual participants were heard and summarise key points (Fontana and Frey 2000). Two assistants also participated, taking comprehensive notes about participants' interactions and communications, operating recording devices and software, troubleshooting technological issues, handling environmental conditions that could influence the quality of recordings and serving as contacts for participants while the study was in progress (Ruff et

al 2005, Krueger and Casey 2015). Table 3 outlines roles and responsibilities for those using technology-enhanced focus groups.

Methodological issues

As with all research, there are important methodological considerations to address when conducting technology-enhanced focus groups. We found several challenges specific to the online environment, including establishing rapport without face-to-face contact, addressing the lack of non-verbal communication, incorporating verbal phrases indicative of active listening, and minimising distractions and outside noises.

Establishing rapport

Rubin and Rubin (2012) described the ‘conversational partnership’, in which researchers and participants develop a relationship that unifies the realities of each person to create a deeper understanding of the topic at hand (Glaser and Strauss 1967, Corbin and Strauss 2008). This method recognises that while individual participants have distinct interpretations of their experiences, they also may add to collective understanding of the phenomenon under study. Critical to the development of conversational partnerships is the ability to establish rapport with participants; trust is foundational to establishing rapport (Marshall and Rossman 2011).

While the need for rapport and techniques for its establishment are similar in traditional face-to-face and technology-enhanced focus groups, it is particularly important online to ensure that participants are engaged. Our team used a variety of methods to accomplish this. Initially, we ensured that interactions to obtain informed consent were conducted in a timely fashion, as agreed on with the individual participants. At the beginning of the focus group sessions, rapport was further established by having all members introduce themselves using only first names for privacy. They provided information about their professional role, setting, time working in their respective fields and the general demographic characteristics of the youths they served. The group moderator called on each participant, to be certain that all voices were heard and all members were engaged with the conversation. Working to create a sense of shared experience and collective understanding helped the group to feel connected to the common purpose of the study, enhancing the richness of the research.

Loss of non-verbal communication

One notable challenge when using technology-enhanced focus groups is the loss of some forms of non-verbal communication present in face-to-face meetings (Table 4). While both ‘chronemics’ (the use of time, such as in the pacing of speech or the presence of pauses) and ‘paralinguistic’ (tone, speech, pitch and volume) clues are retained in online focus groups, some important forms of nonverbal communication are lost, including proxemics (use of space), haptics (use of touch) and kinesics (posture, gesturing and facial expressions) (Novick 2008). Our experience is consistent with the experiences of those conducting phone interviews about sensitive topics – the loss of proximity to our participants may have made them more comfortable in discussing uncomfortable or emotionally distressing situations (Mealer and Jones 2014).

The loss of visual cues that would have indicated to participants that we were actively listening was challenging. However, it also gave us the opportunity to use more paralinguistic cues – for example, using phrases such as: ‘That is an important point’, ‘Thank you for sharing that with us’ and ‘Please continue’ to convey understanding and encourage the participants (Smith et al 2009, Mealer and Jones 2014). The moderator could guide the discussion when needed, using statements such as: ‘Thank you for that. What do others in the group think?’, as well as conduct frequent verbal check-ins with participants, ensuring they were still comfortable and did not have an unstated opinion.

Extraneous noise

Active listening and attention to the flow of the discussion were critically important to our ability to understand changes in tone, voice inflections and pauses when participants were gathering thoughts. The avoidance of extraneous noise was vital to this and we requested that participants find a quiet, private space from which to log into the focus group to ensure that we were not distracted. We encouraged participants to face their telephones or computer microphones, to try to speak clearly and deliberately, and to slow down their speech, to ensure that our recordings would capture their ideas (Seitz 2015). In addition, we situated our group moderator and recorders in different rooms using different phones and recording equipment, to prevent feedback that might render portions of the recording difficult to hear.

Ethical considerations

Informed consent

We identified several important ethical considerations during the study. First, obtaining informed consent was different than with traditional face-to-face focus groups. As soon as potential participants expressed interest in participating, we provided them with a standardised email describing the study and asked them to respond to indicate their continued interest. Several days before the study, we emailed participants a reminder with calendar details of the focus group. On the day of the study, before the focus group, each participant received an additional reminder describing the elements of consent and had a follow-up telephone conversation with two trained research assistants.

Once each participant had completed this process, the focus group could begin. The moderator explained to the participants that they were free to leave the discussion at any time if they chose to withdraw and could do so by simply closing their browser and hanging up their phone. At the end of the group session, participants were again reminded that the proceedings had been recorded and would later be transcribed and analysed. Tables 1 and 2 contain critical elements of the informed consent process and examples of informed consent document language.

Confidentiality and data security

Protecting privacy and confidentiality are important concerns. To minimise the risk of a breach, we ensured that participants were aware that group conversations were private and should not be repeated outside the group, asked participants to refrain from using their real names, used a secure, meeting platform, and stored data on a secure institutional server.

Identifying information, such as names and email addresses, was not stored with study data, to avoid identification of the participants' comments.

Data handling, including the storage of recordings and transcriptions, were also concerns. We stored recordings on a secure institutional server that met the standards of our IRB until transcription and analysis were complete. Laptops and personal devices were not used to store study materials to prevent their loss or theft.

Technical considerations

Before beginning our focus groups, we conducted a test, recording short pieces of regular office conversations, to ensure that voices with different qualities would be understandable on our recordings. To prevent the potential loss of data if our primary recording device failed, we used a second, password-protected recording device as a back-up method. After one focus group, a brief weather-related power outage caused us to temporarily lose access to our meeting platform. However, our secondary recording prevented us from losing data.

While it is difficult to prepare for these unexpected issues, ensuring participants have ready access to several methods of contacting the recorder can prevent groups from being disrupted and data from being lost. Those serving as recorders should have their email applications in full view so that participants are certain to have direct access to them when needed.

We also recommend contacting your transcriptionist before conducting technology-enhanced focus groups, to ensure that the recording format provided by the chosen meeting platform is compatible with their transcription software. Conducting a brief test using the technologies will ensure a smooth process following conduct of the focus groups.

Conclusion

Technology-enhanced focus groups were an effective way to generate data for an item pool for a new youth bullying instrument. The participants – education and healthcare professionals who work with bullied young people – supported this approach. We could recruit a more diverse group of participants using this method, and organising the group was uncomplicated and inexpensive.

Future researchers may consider the use of technology-enhanced focus groups, if the participants and subject matter are amenable to the format.

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TABLE 1

Participant inclusion criteria central to technology-enhanced focus groups

Element	Rationale
Access to the internet (broadband capabilities desirable)	Broadband capabilities ensure that the participants will not experience a time lag between: » What they hear being discussed and what they see on the screen. » What different participants see at a given point in time.
Specific software requirements and/or the willingness to download necessary software	Many electronic platforms require specific software programs, which are generally free to download. Participants should be sent the appropriate download URL in advance and asked to test their connectivity
Access to a telephone - either with unlimited long-distance service or the willingness to pay for the call - if the participant does not have a microphone on their computer	As most focus groups are at least an hour long, long-distance connectivity could be costly. If unlimited connectivity is rare in particular locales, researchers should consider reimbursing participants
A private, quiet place in which to participate	To help ensure the confidentiality of others as well as to improve the quality of the recordings
Acceptance of invitation to participate	Participants can be sent a brief email stating the study's general purpose and why they are being asked to participate, as well as asking them to indicate their interest in participating or to be contacted to receive more information

TABLE 2

Informed consent components useful in technology-enhanced focus groups

Element	Rationale	Suggested consent language
Depending on the study's criteria and institutional review board (IRB) standards, determine whether informed consent is best obtained by mail, email or phone	Consent forms can be posted or emailed. The forms then need to be scanned, signed and returned by post, email or fax »If faxed, the researcher must ensure that delivery is private. »Electronic signatures do not satisfy the documentation requirements.	When consent is obtained by phone, an IRB-approved standardised script should be used
If using video, note that confidentiality is limited	While this is true in face-to-face focus groups, participants may be less aware that they are visible to each other in video	'Although every reasonable effort has been taken to ensure confidentiality in the conduct of this electronic focus group, it cannot be guaranteed'
If using personas or other social identities (avatars), note this in the consent document	Use of personas helps protect confidentiality but is only useful if participants' cameras are not in use	'Participants will be asked to select a personal persona to help protect confidentiality. The researchers will make every effort to protect this information, as they would with real identities'
Note that there is a risk of third-party interception when transmitting data across a network	The investigators need to use a secure platform/software, approved by their IRB, when conducting focus groups. However, even this approach is not completely risk-free	'Confidentiality will be kept to the degree permitted by the technology being used. However, there is always some risk regarding the interception by a third-party when data is sent using the internet. Your conversation also may be automatically backed up on your own institutional server'
Note that data may be held longer than the estimated study period	Institutions may automatically back up data; the frequency and length of storage may be difficult to discern	'It is possible that copies of data may exist on backups or server logs for an indefinite period beyond the scope of this research'
Security protections of all identifiable or coded data transmitted over the internet	Depending on the level of risk, standard security measures such as secure socket layer (SSL) encryption usually suffice in ensuring that responses and IP addresses cannot be traced back to individual respondents	'Encryption is being used to help ensure the privacy of your responses and IP addresses'

TABLE 3

Technology-enhanced focus groups: preparation pearls

Phase	Responsible individual(s)	Consideration
Initial study planning	Principal investigator (PI)	In designing the study, assess institutional review board (IRB) policies regarding audio-taping and videotaping
	PI, research team, tech consultant	Assess platform security and ensure adherence to all IRB requirements
	PI	Plan for IRB-approved secure transfer of audio files to the CITI-certified transcriptionist. Consider using encrypted flash drives, encrypted email and so on
	PI, research team	Plan for IRB-approved secure data storage of focus groups, digital audio and video files, and digital transcriptions
	PI, research team, tech consultant	Participant inclusion criteria should include access to appropriate technology - consider the needed bandwidth, screen resolution, supported browsers, access to proprietary products being used, camera, and so on
Focus group pre-planning	Research team designee, transcriptionist	Determine the audio file format needed by the transcriptionist (for example, MP3, WAV, DSS or MP4)
	Research team designee	Ensure that a CITI-certified team member can convert the audio files to the appropriate format
	Research team designee	Select a quiet, private setting; assess the likelihood of ambient noise from adjoining rooms
	Research team designee	Test recording quality in the rooms/setting where focus group activities will be conducted
Focus group pre-planning	PI, research team	Determine the content of PowerPoint slides to be shown to the participants
	PI, research team designee, tech consultant	Plan to use a dual recording system. Ensure that there is adequate distance between devices, to eliminate the possibility of unwanted feedback
	PI, research team	Devise plan in case of technology failure
Several days before the study	Research team designee	Double check/update participant list of phone numbers they will be calling from as well as personal mobile phone numbers to be used in case of technology failure
	Research team designee	Ensure participants can connect using the computers and/or phones to be used during the group
	Research team designee	Conduct a 'dry run' to increase participants' comfort with group procedures and technologies
	Research team designee	Have participants disable their computers' pop-up blockers if necessary
	Group moderator and facilitator	Practice using real-time troubleshooting features that will not disrupt the group, such as embedded chat or instant messaging
Day of study	Research team designee	Ensure all devices are fully charged and that power cords are available. Have a small power pack available in case of power outage
	Research team designee	Ensure that the chosen setting is still quiet, with no adjacent construction, loud class activities and so on
	Research team designee	Ensure that the moderator and facilitator have access to the PowerPoint presentation
During study	Group moderator	Initiate the study with a 'voice check' of all participants; ensure that everyone can hear each other
	Group moderator	Instruct participants in the use of the 'chat box' feature available on most conferencing platforms to post questions or indicate if they are having technical difficulties.
	Group moderator	Speak clearly and deliberately. Ensure participants can understand

TABLE 4

Non-verbal communication forms and technology-enhanced focus group strategies

Non-verbal communication form	Examples	Focus group strategies
Chronemics	Use of time: pacing of speech, use of pauses	Allowing for longer pauses than in typical conversation, statements encouraging group reflection, 'Let's reflect on that together for a moment'
Paralinguistic	Use of tone, speed, pitch, volume	Use of tone, pitch, and volume to convey emotions and ensure audio levels that can be recorded to capture nuanced discussion
Proxemics	Use of space: distance between participants, leaning in	Use of verbal cues indicating attention to the speaker: 'Please continue...'; 'Hmm... good point.'
Haptics	Use of touch, such as a hand on a shoulder to offer comfort	Use of verbal statements indicating support. 'That must have been difficult for you to remember - thank you for sharing it with us.'
Kinesics	Use of posture, gestures, facial expressions	Requests for verbal affirmation of what we cannot see. 'Mary, it sounds like discussing this has been difficult for you; am I hearing you correctly?' 'It seems that the group agrees on this point. I can't see you nod, so I will ask you to verbally affirm that this is the case. Are there other opinions?'