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A Sense of Fellowship: Mindfulness Improves Experienced Interpersonal Benefits and Prosociality in A Military Aviation Unit

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ABSTRACT

Objective: Explore how personnel in a military aviation unit experienced personal as well as interpersonal aspects concerning their participation in a group-based four-month MBT programme.

Background: mindfulness-based training (MBT) have been used as a personal stress management tool in stressful working environments, including military aviation. There is little knowledge about the interpersonal mechanisms involved when engaging in MBT.

Method: Adhering to Grounded Theory (GT), we conducted post-intervention interviews with 42 programme participants. We selected 30 interviews with evidence of interpersonal effects for in-depth analyses to build a theoretical model of the pathways through which interpersonal effects might develop.

Results: The majority of the interviewees (30/42 = 71%) experienced significant interpersonal effects from MBT. The in-depth analyses revealed an increase in the common theme “Sense of Fellowship” (SOF). SOF comprised three primary change processes: “Attention to others,” “Self-observation” and “Reflection.” In addition, five behavioral changes emerged: “Direct communication,” “Increased patience,” “Decreased anger expression,” “Calmness,” and “Acceptance.” Finally, four contextual factors appeared to have particular importance for the development of SOF: “Plenary sessions,” “Sharing experiences,” “Doing something new together,” and “Sitting in silence.”

Conclusion: These findings indicate that MBT has prosocial effects in a military aviation setting, and the constructed model contributes theoretically by suggesting how these psychosocial effects may arise and develop.

Introduction

The dangers inherent in flying are evident, but a long-term systematic commitment to safety in aviation communities has transformed it into a highly reliable activity. This is not due solely to improvements in systems and checklists. A key factor in this development has been the communities’ commitment to focused team training and a shared belief that strong relationships and collaboration abilities among crewmembers are vital components in managing errors (Burke et al., 2003; Wiener et al., 2010). Crew Resource Management

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(CRM) programmes that enhance awareness of the interpersonal aspects of flight operations have been made available (Wiener et al., 2010). However, the current CRM programmes do not specifically delineate the ways or methods for improving relationship quality or prosocial behavior. Upgrading these aspects of the CRM programmes seems particularly important because ensuring harmonious teams in aviation is becoming more challenging as workloads become larger and organizations comprise teams of increasingly diverse demographic, socioeconomic, and cultural backgrounds (Ricucci, 2018). One type of training that has recently been suggested as a complementary element to current CRM approaches is mindfulness-based training (MBT) (Broome, 2011; Velázquez, 2017).

Mindfulness-based Training

In working contexts, mindfulness has been defined as “a state of consciousness characterized by receptive attention to and awareness of present events and experiences, without evaluation, judgment, and cognitive filters” (Glomb et al., 2011, p. 119). Mindfulness-training refers to all activities aimed at improving the level of mindfulness (Baer, 2003). Mindfulness-based training (MBT) varies substantially in content and duration, but many are inspired by the standardized eight-week Mindfulness-based Stress Reduction programme (MBSR; Kabat-Zinn, 1994) consisting of a combination of meditation exercises and theoretical lectures (Kabat-Zinn, 1994). MBTs for working populations are typically delivered on-site in group settings as a method of stress-reduction (Eby et al., 2019). The individual effects of work-based MBT on individual workers’ stress levels have been investigated (Eby et al., 2019), while the possible prosocial benefits of these interventions has been largely overlooked. This may be a crucial omission as a systematic review of 163 meditation studies found that the effect sizes in four studies of social measures were much larger than those of individual outcome measures (Sedlmeier et al., 2012). Another systematic review of 26 studies of mindfulness-based interventions also found significant increases of a medium effect size on subjectively perceived compassion and empathy toward others (Kreplin et al., 2018), but the authors warned that the causes of such effects were unclear due to the differential designs of the previous studies. Only one of the included studies found prosocial effects from MBT programmes without an emphasis on relationship enhancement in their theoretical curriculum (Khaddouma et al., 2016). We could only find two scientific studies addressing the use of MBT in an aviation setting (Meland, Fonne et al., 2015; Meland, Ishimatsu et al., 2015). One study tested a 12-month long MBT in a military fighter aircraft cohort (Meland, Fonne et al., 2015). Another study tested a four-month MBT on a military helicopter unit. Although the authors of these studies commented on the potential social effects of the interventions, this was not their primary aim, and they did not apply rigorous qualitative methods that could shed light on the potential pathways through which such effects might develop.

Despite the methodological shortcomings in the field and the lack of research in aviation contexts, there are preliminary indications that engaging in MBT may produce interpersonal gains and facilitate prosociality, but the underlying mechanisms remain elusive. Furthermore, since MBTs are both time-demanding and resource-intensive, it is important to investigate how all the potential benefits of MBTs may be facilitated and boosted in the workplace beyond being used as a mere stress reduction tool. In order to inform the future implementation of MBT in an aviation setting, a first step would be to explore whether the

participants experience prosocial benefits, and secondly, to produce a framework to suggest how such effects might arise, develop and be strengthened. The purposes of this study were therefore: 1) to investigate without any prompts in this direction whether prosocial benefits were present or prominent among military aviation personnel after they attended an MBT programme at their workplace; 2) if so, to develop a framework of the change processes underlying the benefits experienced.

Methods

The study was approved by the Norwegian Committee for Medical Research Ethics (Ref: 2011/169). Since this area of study is underdeveloped theoretically, we applied a Grounded Theory (GT) method (Corbin & Strauss, 2008) specifically designed for the generation of an initial hypothetical or theoretical understanding of an unexplored area (Henwood & Pidgeon, 2003). We capitalized on the rare opportunity afforded by access to personnel at a military helicopter unit (N = 53) during a prolonged period in which there was a high workload during their preparations for redeployment to an aeromedical mission in a conflict area. Participation was voluntary, and all the participants provided written informed consent prior to their participation. To avoid confirmation bias concerning the prosocial effects, the stated purpose of the interviews was “to gain a better understanding of the experiences of MBT in a military aviation unit.” Workers who declined participation at recruitment (n = 3) were excused from the data collection procedures but otherwise followed the MBT programme like the other participants. Eight participants were not available during the two weeks of the interviews, and thus, the response rate was 79% (42/53).

Data Collection

The data were collected five months after the intervention period during a two-week period at the squadrons' home base. All the interviews were conducted face-to-face by the same interviewer (E.H). During the first part of the interview, the participants were invited to speak freely about their experiences with the MT. The interviewer used a semi-structured interview guide during the latter part of the interview based on a Norwegian version of the Five Factor Mindfulness Questionnaire (Dundas et al., 2013). The interviewer had no prior participant contact and was not involved in the programme's development. The interviewer did not at any point prompt the participants to speak about social or interpersonal effects. The interviews ranged in duration from 30–90 minutes (mean 45 min, SD 15 min) and were audio recorded, transcribed and coded by three trained research assistants

Coding and Analysis

According to Corbin and Strauss (2008) GT procedures, the 42 transcribed interviews were independently coded (with intercoder agreement of >80%). We identified the main categories and chose the thematic focus (i.e. experiences of prosocial effects of MBT) based on the high level of reoccurrence in the interviews. We performed further analyses only on the focused sample of 30 individuals with statements that related to interpersonal effects. We conducted axial coding of the focus area (i.e. to relate the categories to one another and discover connections and differences between the categories). Through

selective coding, a core category (i.e. fellowship) emerged, and we developed a model supporting the core category (see [Figure 1](#)). We used MAXQDA (VERBI, Germany, version 11) for the analysis.

Participants

The participants consisted of the flight crew ($n = 19$) and the aircraft technicians ($n = 13$), with a mean age of 32 ($SD = 8$) years (range: 20 years to 50 years), and with a mean working experience in military aviation of 11 years ($SD = 5$) (range: two years to 26 years). Seventy per cent were married or living with a partner, and 45% had one or more children.

The Intervention

The MBT intervention was inspired by the guidelines for the eight-week Mindfulness-Based Stress Reduction programme (MBSR; Kabat-Zinn, 1994). However, in order to fit the unit's schedule, the intervention period was extended to four months with theoretical lectures every other week and 25-minute daily meditations on workdays, instead of the weekly lectures and 45-minute daily meditations used in the standardized MBSR. The content of the theoretical lectures was also adapted to fit a high-performance environment and the current context. For example, MBT was linked to mental preparations used in elite sports, and examples relevant to aviation were used. The intervention began with a 10-hour comprehensive weekend session, followed by daily plenary MBT practice from 08.05–08.30 a.m. during workdays, and a 1-hour theoretical lecture followed by focus groups every other week. In these focus groups, the participants were invited to share personal experiences and challenges related to participation in the programme. In the daily plenary training sessions, the participants alternated on a weekly basis between sitting meditation and a sitting¹ body scan. To increase MT practice time, we encouraged the participants to carry out everyday activities that they usually did on autopilot more mindfully (e.g., working out, talking, listening, eating, walking, driving, etc.). Two MBT instructors led the intervention, both with a minimum of 10 years of personal meditative practice and a formal accreditation as an MBT instructor from the Scandinavian Center for Awareness Training (www.scat.no). The participants' partners were also offered MBT. For further details on the intervention, see (Meland, Fonne et al., 2015). During the first month of the intervention, the participants received guidance during their daily meditations through prerecorded programmes played via loudspeakers. For the remaining two months, the participants sat together in silence doing the MBT exercises without external guidance with an alarm clock to keep the time. They discussed interpersonal aspects when relevant in the focus groups, but the instructors did not emphasize any of these aspects in any of the intervention components (i.e. the theoretical lectures, meditations or audio guidance).

Results

Central Theme

Thirty of the 42 (71%) interviewed participants reported several interpersonal and prosocial effects of the intervention. We based our results on these 30 participants' reports. Overall, when referring to the experience of prosociality and interpersonal effects, the participants

Change Process of Mindfulness

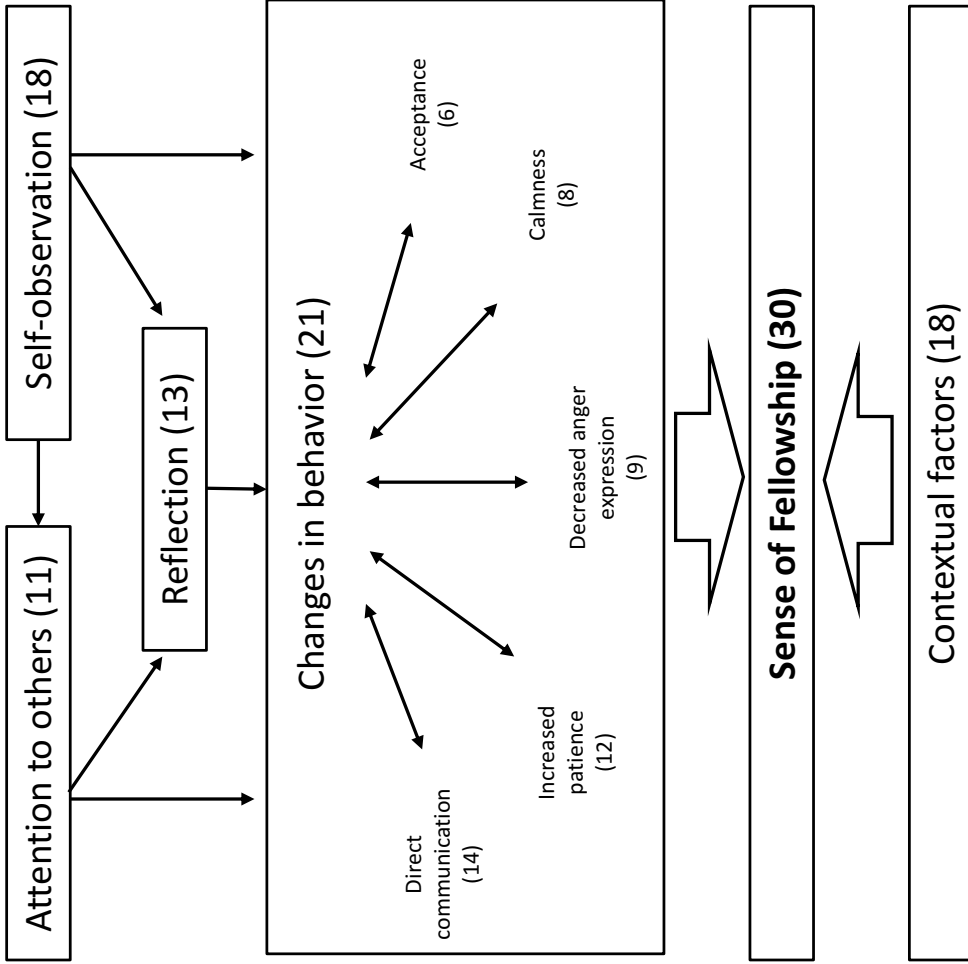


Figure 1. The Grounded Theory (GT) model of the processes facilitating an increased sense of fellowship in a Norwegian military aviation unit participating in mindfulness-based training (MBT). The numbers in brackets () denote the number of participants referring to a given category.

used words such as increased unity, trust, cooperation, rapport, openness, and connection. We found that the term that best captured these reports was “a sense of fellowship” (SOF) as further explained below. We illustrate our proposed model in [Figure 1](#), and [Table 1](#) contains a collection of examples of participant reports on the different components of the model.

Underlying Themes

The participants differed in their explanations as to why MT increased their sense of fellowship (see [Table 1](#)). However, three primary change processes, supported by four behavioral changes, and four contextual components appeared to be central in the experiences of increased SOF (see [Figure 1](#)).

Primary Change Processes

Three primary change processes emerged as important to the development of SOF in the unit.

1) *Increased self-observation*: Eighteen participants reported that an increased awareness and knowledge of their personal thoughts and feelings led to improvements in their social skills and attentiveness to others. 2) *Increased attention to others*: Although it was disturbing at times, 11 participants reported that becoming aware of, and perceptually attuned to, others was a fundamental ability that improved their relationships with others. 3) *Increased reflection*: While elaborate thinking also was reported to be somewhat problematic at times, 13 participants reported that such increased consideration of one’s own and others’ experiences, actions, and behaviors had helped them to respond in more adaptive ways during social encounters.

Behavioral Changes

We identified five distinct changes in behavior that seemed to facilitate SOF in the group. 1) *More direct communication*: Fourteen participants reported that an improved ability to openly share opinions, feelings, and needs during social encounters had helped them to improve their relationships with others. 2) *Increased patience*: Twelve participants reported that an improved capacity to stay composed and tolerate delay improved their relationship with others. 3) *Decreased anger expression*: Nine participants reported that their tendency to express less anger in social situations was important to the quality of relationships. 4) *Increased calmness*: Eight participants explicitly reported that an ability to remain relaxed and composed in situations in which they previously had been tense or agitated was helpful in their relationships with other people. 5) *Increased acceptance*: Six participants emphasized that applying a more accepting attitude toward oneself and others, instead of being critical or intolerant, had improved the quality of their relationships.

Context

We identified four contextual factors that seemed to be important to the development of fellowship in the unit: 1) plenary sessions; 2) sharing experiences; 3) doing something new together; and 4) sitting together in silence.



Table 1. Summary of the interview data.

FELLOWSHIP

- Our work environment has become, if possible, even better. We talk more openly about problems ... seem more socially committed and try to solve problems as a group (P53).
- We became closer, regardless of the group we belonged to [i.e., technical, operational, or administration] ... People have gotten to know each other more deeply and the MT sessions really created new bonds between us all (P6).
- We became more aware and attuned to ourselves and the people around us ... we became much more connected, and now [after the MT intervention], we can easily solve difficult problems among ourselves (P48).
- The MT has made me feel safer among others and has given me a confidence that I can act in appropriate ways even when things are at their most difficult (P24).

PRIMARY CHANGE PROCESSES

Self-observation (18):

The ability to be consciously aware of personal emotions, behaviors, and thoughts.

- After the daily MT sessions, I could more easily sense what I was feeling. This has made it easier for me to convey my feelings, but also to understand what others feel ... this [self-observation] has really brought me closer to and improved my relationships with others (P71).
- I have become more observant of what I am thinking and feeling before I act in daily life (P44).
- By turning on my senses, MT made me see myself and my colleagues as human beings ... and not as machines (P48). I have become aware of times when I am inattentive. This awareness decreases the chance of reacting and acting in automatic and habitual ways, especially toward others (P53).
- I see people in a different way now. I see them more, and I see them in detail ... how they behave, how they act, and what they are trying to communicate ... and I have realized how much information actually is non-verbal (P37).

Attention to others (11)

The ability to be aware and perceptually attuned to the messages and behaviors of others.

- By being really perceptually attuned to others, you catch the essence of what they are saying. You pay attention to how they express themselves and behave or don't behave. Then, I can better figure out the underlying reasons for what they are saying or doing ... and what their needs are (P34).
- I can sit down and just listen to people ... I just turn toward them and really listen when they are talking (P53).
- I have become aware of the fact that it is not good to focus on other things when you have a conversation with other people ... it makes them feel less important and is a bad way of communicating (P6).
- I became more sensitive and aware of coworkers disrupting conversations ... I also became a bit more judgmental and irritated by coworkers who I felt stressed themselves unnecessarily (P4).
- I have started thinking about what I say to others ... thinking more about how I feel and what signals I am sending. This really improved my relationships with my colleagues (P43).
- I think MT made us see things more deeply, but without losing perspective (P48).
- Before the project period, it was difficult to gather all my thoughts. They were just spinning around, and I could act somewhat out of control. I act more rationally now (P24).
- I have started to think more in difficult situations. This has enabled me not to let things escalate into conflicts (P66).

(Continued)

Table 1. (Continued).

<p>FELLOWSHIP</p>	<p>CHANGE IN BEHAVIOR</p> <p>Direct-communication (14) A tendency to be assertive and open when approaching others, including increased consistency between body and language.</p> <p>Increased patience (12) A capacity to stay composed and tolerate delays without giving in to impulsiveness.</p> <p>Decreased anger expression (9) A tendency to act in a friendlier and more compassionate way.</p> <p>Calmness (8) An ability to remain relaxed and at ease in situations where one previously experienced tension and excess arousal.</p> <p>c) Acceptance (6) A tendency to value and apply a more accepting attitude toward oneself and others, and not to be overly critical or judgmental.</p>
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- ... it is easier to be open toward one another after the (MT) course ... there is more room to discuss negative things and how to change them. This has really increased trust and honesty (P53).
- After the MT, I am better at saying things I think, and I say them earlier ... I don't say everything that comes to mind, but it can be negative things I want changed. The good thing is that I also remember to give positive feedback and compliments to people near me, not just think I should do it (P5).
- I am better at filtering the stuff that comes out of my mouth. For instance, I am more conscious when I get caught in an argument. I am more factual, and I don't just say the things that are on my mind (P4).
- I have become more aware that it is smart to think before you react - especially to something people have said or done. I remind myself to wait a bit so I can have a chance to think ... not only when I am angry, but also when I am eager. I have understood that bursting out with what I think is not always the smartest thing to do ... not if I want other people to listen to me (P36).
- People at the squadron seem to be able to work better together as a group. They listen to each other more, instead of instantly trying to find counter-arguments and start discussions (P66).
- I believe this shift [toward becoming more patient] developed as a result of being aware of the tendency for my mind to wander during daily life ... and my increased ability to focus and just keep observing instead of merely reacting like I always used to do ... with no conscious awareness whatsoever (P53).
- I have become nicer toward people ... before, I tended to have a blunt and even hostile attitude toward my younger colleagues, but not anymore ... I have started to care more about them (P59).
- It is a lot easier for me to not just "fire up" during a discussion ... I can take a step back and reflect upon what is occurring [...] (P70).
- What feels really good is that we [at the squadron] don't have that many angry outbursts anymore, but at the same time, people seem to have become more involved and committed to their work (P36).
- I can see MT has made me calmer in daily life, which has really helped me to become more patient and tolerant toward others (P55).
- ... many seem calmer and I think we use our time in the right places instead of stressing. I think that is really great, because when I see that the tense people who surround me every day are now able to relax, it makes my shoulders more relaxed, too (P47).
- We have gotten to know one another. We are still just as ambitious, but people don't seem as stressed after taking 10 minutes [of meditation] almost every morning (P24).
- The more difficult a situation is and the more temperament and feelings people express, the more I feel I can stay calm (P66).
- I think I became more accepting through MT ... when I regularly practice being observant of myself in the MT exercises, I experience a large effect both toward myself and in how I relate to the people around me (P70).
- I try not to let other people's attitudes toward certain people influence what I should think. Instead, I try to be open and take time to get to know people (P53).
- I try not to judge myself and other people so negatively ... not immediately. Generally, I try to be more positive toward things, not to be so pessimistic (P26).

(Continued)



Table 1. (Continued).

FELLOWSHIP	
CONTEXTUAL FACTORS	
Plenary sessions	
Sharing experiences	
Doing something new together	
Sitting in silence	
<p><i>The project as a whole has created a coherence between us. We have spent a lot of time together doing the exercises. We received the same basic information, did the same training, and were given the opportunity to discuss and share our experiences in groups throughout the intervention. That was important, and this combination has made us all more open, and I feel safer and more confident around my colleagues (P37).</i></p> <p>() denotes the number of participants referring to a theme</p>	
	<p><i>- It helps a lot to have MT at work [and not at home] ... the meditation creates a routine and fellowship which has created big changes at work (P19).</i></p> <p><i>- Hearing that others were not only experiencing the training as easy and beneficial, but also challenging, created a mutual understanding between us (P2)</i></p> <p><i>- It is like you meet your colleagues in a new way, because we had something totally different to talk about, and this [doing something new] turned into some sort of fellowship (P68).</i></p> <p><i>- The experience of being completely silent together is really special, because in some way, you become really united by it. We have developed more respect for one another, but without talking more. (P6).</i></p>

Table 1: Example of the participant reports of the different processes facilitating an increased sense of fellowship in a Norwegian military aviation unit participating in a four-month mindfulness-based training intervention.

Discussion

The purpose of this study was to explore whether prosocial benefits were present or prominent among military aviation personnel after attending an MBT programme at their workplace. If so, we wanted to develop a framework of the change processes underlying these experiences. Centrally, we found that the majority (71%) of the interviewed participants reported that they experienced an increased SOF due to the MBT programme. This is a considerable proportion of the participants, since no specific weight was put on prosocial enhancement in the programme, and since the post-programme interviews did not contain any prompts to talk about the social aspects. Our findings therefore support the existing theories and reviews of the research suggesting that MBT interventions have effects beyond the individual (Good et al., 2016; Kreplin et al., 2018; McCown, 2016; Sedlmeier et al., 2012). Apart from one study included in these reviews (Khaddouma et al., 2016), all the studies had tailored their curriculum in some way to include more interpersonal aspects. Thus, our study extends the previous findings to suggest that there might also be interpersonal gains from MBT programmes even in the absence of such modifications.

Based on our initial analysis, we constructed the common theme “A sense of fellowship” (SOF) and identified five paths through which SOF developed in the unit during and after the MBT intervention. Our findings and their prevalence present an argument for the use of MBT in aviation contexts not only to reduce stress and promote stress resilience (Meland, Fonne et al., 2015; Meland, Ishimatsu et al., 2015) but also as a means of improving prosociality and interpersonal relationships. By offering an initial framework for understanding aspects of some of the social mechanisms involved during and after MBT, it may be helpful to guide future implementations of work-based MBTs in aviation and other work-related contexts. One practical implication of our findings is that, when aiming at improved interpersonal benefits, a good strategy would be to ensure enough time for practice together in group sessions rather than individual practice. The need to expand on the theoretical curriculum to include interpersonal aspects may not always be necessary.

Primary Change Processes

Becoming more attuned to others was one of the primary processes that seemed to improve SOF in our sample. Improvements in concentration and sustained attention are a common effect of MBT (Tang et al., 2015), although this may not be specifically tied to the meditative activities (Jensen et al., 2012). If this attentional attunement is characterized by an open and non-evaluative attitude, it is regarded as fundamental to empathic cognition and behavior (Trautwein et al., 2014) and as the first step to understanding the needs of others (Deci & Ryan, 2002). Attending to fellow workers’ needs has previously been identified as an important marker of high-quality relationships in work contexts (Dutton & Heaphy, 2003) and giving the right social support at the right time (Jones et al., 2019). The results from a longitudinal analysis using questionnaire data from four time points over 15 months supported the prediction that a need-supportive work climate was positively related to the

level of mindfulness and occurred through the satisfaction of the basic psychological needs of autonomy, competence and social support (Olafsen, 2017).

Becoming more perceptually attuned to oneself was another primary change process leading to an increased SOF in our sample. This is in line with studies showing that being attuned to oneself can help people overcome their barriers of self-knowledge (Carlson, 2013). Specifically, being aware of one's own internal state, biased thinking, and likes and dislikes can facilitate the development of positive relationships. Improved reflection was the third primary change process leading to SOF in our sample. This may seem counter-intuitive, as a main aspect of mindfulness is to maintain awareness of experience as it unfolds, without superimposing meta-cognition or reflection (Kabat-Zinn, 1994). However, this may simply reflect differences in definition. We described "reflection" as "a more thorough thinking and consideration about one's own and others' experiences, actions, and behaviors." In other words, according to our description, "reflecting more" does not involve story building, interpretation or superimposing meaning to social situations. Instead, the way we categorized the reflection items in the interviews involved aspects of balancing information, re-perceiving, seeing things again more deeply from a different perspective and non-judgmentally. The participants (see Table 1) underscored that their capacity to use online situational information "here and now" to make informed evaluations of how to best respond in social encounters had improved. This echoes the findings in Shonin and Van Gordon (2015) qualitative study of the individual effects of MT in white-collar managers. The managers reported that MBT developed their ability to view situations with equanimity and perceptual distance. Moreover, the three primary change processes worked in concert. Being more attentive to oneself and the "here and now" in a non-judgmental way enabled Shonin and Van Gordon's participants to see social situations and other people's needs more clearly, which seemed to lead to less biased content of reflection and more functional responses in social situations.

Behavioral Changes

The most frequently described behaviorial change of relevance to SOF in our current sample was the perceived increase in "direct communication" at the unit. Referring to the participants' reports (Table 1), this involved becoming more honest and constructively assertive during social encounters. On the one hand, being assertive may expose an individual to a variety of negative responses from others, such as anger, disappointment and frustration (Ball et al., 1994), but a lack of assertiveness may restrict individuals' behavior repertoire in social situations and can increase parasympathetic nervous system activity (Gross, 2002). On the other hand, the participants may have become more accepting and open to difficult feelings, leading to a reduced fear of negative responses from others. MBT may have created a more secure environment, allowing for the expression of assertive behavior without triggering unnecessary negative responses in others. Indeed, a trusting and secure environment has been associated with more honest communication in the workplace (Carmeli & Gittell, 2009). Nonetheless, this should not be regarded as a trivial finding, as having the courage to be assertive and communicate in a direct and honest way in critical situations is highly valued in aviation (Wiener et al., 2010).

We found that the other four behavior changes were closely linked to the stress-reducing effects of the intervention. Stress, inattentiveness and hostile feelings are well-known

barriers to performing caring and compassionate behaviors (Block-Lerner et al., 2007; Jazaieri et al., 2016). The stress-reducing effects of on-site MBT interventions have previously been found in aviation environments (Meland, Fonne et al., 2015; Meland, Ishimatsu et al., 2015) and in other work contexts (Eby et al., 2019). An increased ability to stay relaxed, attentive and composed may have a direct beneficial effect on social encounters, as people naturally conceive angry, impatient or excessively judgmental individuals as threatening or unfriendly (Staugaard, 2010). Because providing social support also can be demanding (Jones et al., 2019), fatigue or depleted energy levels may have been a barrier to providing social support, which was reduced along with the general stress-reducing effects of MBT. In other words, reduced stress may be a mediator for prosociality. Better sleep was mentioned by some participants and is yet another possible mediator or explanation for our findings because sleep deprivation has been associated with reduced sensitivity to social cues (Killgore et al., 2017). Although MBT has been shown to improve sleep in some groups (Winbush et al., 2007), a test of a similar MBT programme in an aviation unit did not show any significant pre-post changes in the quality or length of sleep (Meland, Ishimatsu et al., 2015).

Self-compassion also seemed to be a foundation for an increased SOF (Table 1). Similarly, self-compassion scores in students have been associated with higher scores on questionnaires measuring compassion for others (Neff & Pommier, 2013). On the same note, students scoring high on self-criticism were more hesitant to accept compassion from others due to a fear of being compassionate to oneself (Gilbert et al., 2011). This opens the possibility that prosocial behavior had been prevalent at the unit prior to the intervention, but that the workers had not been responsive due not only to stress or inattention, but also possibly to a lack of self-acceptance and compassion.

Context

A prominent finding in the current study was how the group-based format of the MBT intervention seemed to have played an important role in the development of SOF. Even meditating individually in a group created a shared experience and shared paths throughout the intervention. The participants felt that a sense of novelty was added to some of their daily routines together, bolstering interest and motivation, which may be related to a classical effect known as the Hawthorne effect (benefits from introducing novelty). The benefits of doing MBT in a group setting are consistent in the qualitative literature. Two meta-syntheses of qualitative studies of MBT show that group support, inspiration and normalization from group members were among the most important experienced factors for beneficial outcomes from MBT (Cairns & Murray, 2015; Wyatt et al., 2014). A multilevel meta-analysis demonstrated that across 59 MBSR groups, the Group factor explained approximately 7% of the effects of MBSR on an index of general distress, but 0% of the changes in medical symptoms (Imel et al., 2008). In comparison, a meta-analysis of 16 mediation studies of MBSR demonstrated that the increase in perceived attentiveness also explained about 7% of the primary outcomes in these studies (Gu et al., 2015). McCown (2016) underlined that mindfulness is something we learn *together*. He summarized the relational outcomes of MBT as a nonhierarchical, non-instrumental type of “Friendship.” This resonates with our findings and the rich descriptions of how “doing something together” and “sharing experiences” made the participants feel happier, closer, and more

connected. In other words, the group processes tied to MBT may be as important as the changes in individual capacities (e.g., attentiveness).

While group effects could be gained through a range of interventions with a plenary design, the current study points to a few contextual characteristics that may be specific to MBT. Sitting in silence and doing mental training activities systematically in synchrony is not a common ingredient in interventions. Thus, it has been postulated that in group-based MBT, the many peaceful faces, postures, gestures and sounds of calm breaths during and after the sessions may spread throughout the group, helping everyone to remain or regain emotional balance (McCown, 2016). Anthropologists and sociologists have theorized that social rituals such as marching, singing and dancing together may produce positive emotions that weaken mental and social boundaries between the individual and the group (Haidt et al., 2008). One study showed that students who were led on a walk around campus in-step in groups of three cooperated more in subsequent group economic exercises compared to groups who were led to walk normally (Wiltermuth & Heath, 2009). Although their study involved gross motor movements, similar effects may play a part when sitting in silence and doing mental activities. This should be tested further in future studies.

Moreover, our findings add support to the theory that when thoughts and feelings with emotional content are seen as transient events and are viewed non-judgmentally as advocated and trained in MBT and other contemplative traditions, they tend not to trigger the same activation response or to dictate our perceptions and responses (Hölzel et al., 2011; Kabat-Zinn, 1994). Our findings underscore the importance of context and group layout for the outcome of MBT and suggest that the interpersonal effects of MBT can be gained without changing the curriculum of the MBT or including more theory on the interpersonal aspects.

Our findings are similar to those in qualitative studies in other populations (Allen et al., 2009; Bihari & Mullan, 2014; Smith et al., 2007), suggesting that the change processes underlying MBTs' social benefits may be similar across diverse populations. Perhaps the most striking similarity was found in Bihari and Mullan (2014). They used GT methodology to investigate how "relating mindfully" affected individuals at risk of recurrent depression. Like our study, "observation of self" and "attending to others" emerged as core categories in their analysis, together with acceptance, communication, patience, and calmness. Allen et al. (2009) also investigated individuals suffering from recurrent depression. They described how the change processes of "being on an even keel" and "group sharing" during the MBT intervention led to a positive change in emotional closeness, communication, and empathy. Smith et al. (2007) explored the feasibility of MBT for older people where one of the themes was "getting on with others better." All three studies also found that the group context seemed to have an important impact on the benefits of MBT. Our study confirms these findings and further adds to them by offering a model suggesting the exact pathways through which MBT may facilitate interpersonal benefits in a military aviation context.

Strengths and Limitations

One of the strengths of our study is the use of a rigorous qualitative method, which allows the construction of an initial framework for understanding the sometimes confusing patterns of change and feedback from the participants in previous studies of aviation

personnel who have been exposed to MBT (Meland, Fonne et al., 2015). GT methodology may also capture contextual factors that are important to the outcomes of a multi-faceted comprehensive intervention. The study included a large sample size compared to other studies using GT methodology, which may increase the representativeness of our model. By interviewing a group working together and not from separate organizations, the experiences of one individual were confirmed independently by the others, improving the internal validity of the findings. Using GT methodology with individuals and not prompting the participants to talk about any specific topics during the interviews may have reduced some of the inherent risk of confirmation bias in the experimenter in qualitative studies. We also used an external interviewer who was not actively involved with the interviewees prior or during the intervention, meaning that the participants should have had no specific incentive to please the interviewer.

Despite these strengths, our study also has several limitations. The most important drawback of GT methodology is that some meaning may be lost in the process of reducing large amounts of data. Statements could be decontextualized, and the participants' individual stories could be fractured. Although this is a well-known limitation of GT methodology, which may be difficult to counter, the axial coding procedure, in which the categories were related to one another to identify connections, may mitigate this limitation to some extent. Another limitation is the five-month separation between the intervention and the interviews. Although it increases the chance of capturing some of the after-effects of MT, it also increases the possibility of the invention of narratives (i.e. stories) due to forgetting, recall bias based on their experience of the effects, and the extra time for information sharing between the participants.

Since the group format seemed to account for much of the social benefits of MBT, one could also argue that increased SOF would arise from the experience of many social activities that are pleasant and relaxing. Comparisons between individual and group-based MBT interventions have been done (Jensen et al., 2015), but they investigated the differences on the interpersonal level. Thus, future experimental studies should investigate whether the prosocial benefits of MBT are limited to group interventions or if one can find similar effects when MBT is delivered individually. This group of male military aviation personnel may also be unique in many ways, and generalization to other groups should be done with caution.

The statements concerning a Sense of Fellowship are not concluded to be generalizable to all, as twelve participants did not report "relational" effects. As we did not conduct a follow-up interview asking directly about relational effects, we cannot rule out that these twelve participants did not experience such effects. We have no other types of data, such as quantitative background data, suggesting that these twelve participants were different in any such measures from the thirty participants included in the study.

Conclusions

Based on in-depth interviews with 30 MBT participants in a military aviation setting, we derived a Grounded Theory-based model proposing the overall construct of "a sense of fellowship" (SOF). Our model was based on detailed descriptions of experienced change processes and suggested three primary change processes with five behavioral processes and four contextual components supporting the overall SOF construct. The model may

contribute to the guidance of further studies and theoretical development concerning the psycho-social mechanisms of change within the use of MBT in military aviation contexts and within MBT research in general. Before implementing MBT as an upgrade of the current CRM programmes in aviation, future experimental studies should establish whether MBT actually influences cohesiveness in an aviation context and the exact organizational benefits tied to this.

Note

1. Due to space restrictions, the body scan had to be done sitting on chairs and not lying down.

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