The effect of informal social support: Face-to-face versus computer-mediated communication

Joshua Lewandowski *, Benjamin D. Rosenberg, M. Jordan Parks, Jason T. Siegel

Claremont Graduate University, 150 E. 10th Street, Claremont, CA 91711, USA

ABSTRACT

Survey data were collected on a military sample to test two main hypotheses about the impact of face-to-face and computer-mediated social support following disruptive life events. We tested two main hypotheses: first, as previous research indicates, the impact of a disruptive life event is partially dependent upon the amount of social support one receives during the time of the event (H1). Second, the type of communication used will further impact the effectiveness of social support in comforting individuals following a negative life event. Results support both hypotheses, indicating that the buffering role of social support following a disruptive life event is not only dependent upon the amount of social support one receives, but is further affected by the type of communication that participants used to receive support. These findings provide support for the buffering hypothesis' utility in the realm of computer-mediated communication, as well as the application of the cues-filtered-out approach in the mediated social support domain.

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1. Introduction

With the proliferation of computer-mediated communication (CMC), the potential ways in which individuals can access and receive social support have multiplied. Indeed, data indicates that 74% of Americans go online, and nearly 70% of Americans use email daily (Pew Internet & American Life Project, 2010). Furthermore, 50% of young adults use social networking sites (e.g., Facebook, MySpace, Twitter) everyday (Sarason & Sarason, 2009) and 37% of US adults regularly access social media related to mental and physical health (Freeman, Barker, & Pistrang, 2008). A recent survey by Pew Internet Research found that 61% of American adult respondents had used the Internet to look for health-related information—including social support (Freeman et al., 2008). Military personnel are no exception to the increase in technology use. In fact, Wilson, Onorati, Mishkind, Reger, and Gabm (2008) found that military service members are proficient at using email, cell phones, and chat rooms to communicate with their support networks. Moreover, these authors found that military personnel are in support of further utilization of CMC for access to social support.

Social support is particularly important for members of the United States armed forces because they are subject to myriad stressors that have the potential to affect their lives as service members and as citizens (Dolan & Ender, 2008). There is a large literature that indicates the wide-ranging effects that negative events—such as being deployed, losing a friend, or being injured in combat—can have on individuals' physical and psychological well-being (Cohen, Gottlieb, & Underwood, 2000; Uchino, 2006). Fortunately, prior research indicates that social support can attenuate the impact that experiencing negative events has on individuals' physical and mental health (e.g., the buffering hypothesis) (Cohen, 2004; Cohen & Wills, 1985).

Given the popularity of mediated communication, a relatively large literature has developed that explores the effectiveness of online support groups in mitigating the psychosocial impact of dealing with various disorders and diseases (e.g., breast cancer, HIV/AIDS, and depression) (Coursaris & Ming, 2009; de Graaf et al., 2009; Vilhauer, 2009). Overall, this body of research indicates that online support can have a positive impact on individuals struggling with the potentially disruptive effects of disease and disorder (Wright, 2002; Wright & Bell, 2003).

A caveat of this literature, however, is that most of the research examines *formally* organized support groups that are convened with the explicit purpose of providing members with social support for a specific issue (e.g., HIV/AIDS). Fewer studies have looked at the use of computer-mediated social support that is *not* received in a formal group setting—that is, *informal* social support. Put differently, it seems that these two types of social support—formal, group-based support and informal, inherent support—are theoretically different. In the present research, we are interested in examining this type of informal support. Specifically, we investigate how individuals' outcomes from informal online social support might differ from the consistently positive results of formal online support groups.

* Corresponding author. Tel.: +1 609 216 2731.
   E-mail address: Joshua.Lewandowski@cgu.edu (J. Lewandowski).

Several theories have been posited to explain the systematic ways in which technology affects individuals' interpersonal communication (e.g., media naturalness theory) (Kock, 2004). Collectively, these theories—media richness (Daft & Lengel, 1986); social presence (Short, Williams, & Christie, 1976); and media naturalness (Kock, 2004)—are referred to as the cues-filtered-out (CFO) approach. In the CFO framework, the quality of an interaction is based upon the number of cues—both verbal and non-verbal signals such as tone of voice or hand gestures—that a given media allows. Face-to-face communication offers the maximum amount of cues, and is thus of the highest quality; mediated communication, on the other hand, is laden with fewer cues and thus decreases the quality of interaction (Daft & Lengel, 1986; Kock, 2004; Short et al., 1976).

Little research has examined how the technology through which support is received affects its ability to mitigate the impact of a negative life event. Research has repeatedly shown that social support moderates the relationship between life changes and negative outcomes (Cohen, 2004; Cohen & Wills, 1985) and that computer-mediated social support is effective (Wright, Rains, & Banas, 2010). Limited empirical work has attempted to compare the ameliorating power of social support received via face-to-face means with mediated communication. Thus, it is possible that the medium through which the support is received also impacts this relationship. In the present research, we contend that the number of cues available via a given medium will further explain the role that social support plays in defending individuals against the impact of negative life events.

Drawing from the CFO approach (Daft & Lengel, 1986; Kock, 2004; Short et al., 1976), we argue that the impact of social support is somewhat dependent upon the type of medium through which it is received. Face-to-face social support is laden with more cues, and thus will result in lower levels of disruption over time; however, fewer cues are available in CMC-derived social support, which will thus lessen support's attenuating impact.

The objective of the current research is to examine the effects of computer-mediated and FTF social support in an attempt to extend previous claims (e.g., Cohen & Wills, 1985) that social support ameliorates disruptive life events. Thus, the driving research question is as follows: what differential effect does the medium of social support have on individuals during disruptive life events? We contend that the medium through which the support takes place will offer a supplementary explanation beyond merely the *amount* of social support one receives.

In the present paper, we first discuss relevant literature and the theoretical underpinnings of our approach. Next, we outline our hypotheses and methods of study. Subsequently, we present our results along with discussion of the findings. Finally, we will conclude with several implications of our data, as well as some limitations of the present study.

2. The impact of negative life events on health and well-being

2.1. The physiological effects of negative life events

There is an abundance of literature to support the contention that enduring negative life changes can have physiological effects on individuals' well-being (Uchino, 2006). Overall, research indicates that individuals who experience more negative life events have higher mortality rates, higher incidence of cardiovascular disease, and more likelihood of contracting infectious disease (Uchino, 2006). There is also evidence that links increased life changes with higher incidence of cancer. Two specific examples from the literature are detailed below.

Theorell and Elmund (1993) found that people who experienced negative life events had significantly different levels of blood pressure than those who had experienced positive events or no events. Specifically, participants who indicated having experienced negative life changes had significantly higher prolactin and triglyceride levels, in addition to higher diastolic blood pressure after the changes. Participants who reported having experienced no events did not demonstrate any physiological effects. Moreover, participants who indicated they had experienced positive changes showed the opposite effects (i.e., lower blood pressure) of the negative events group. The authors argue that these findings indicate the profound impact that stressful life events can have on physical health.

In another study, Ravaja, Keltikangas-Jarvinen, and Viikari (1996) determined that the accumulation of negative life changes contributes to the early development of metabolic syndrome, which is a precursor to coronary artery disease, stroke, and Type II diabetes. Specifically, Ravaja et al. found that life changes significantly predict serum insulin levels, which have been implicated as an underlying cause of metabolic syndrome. These investigators conclude that, given their data, negative life events are an important factor to consider in individuals who are at risk of developing metabolic syndrome. These two studies—as well as many others (Uchino, 2006)—offer evidence that negative changes in people's lives can have unique, often harmful, physiological effects.

2.2. The psychological effects of negative life events

Negative life events also influence people's psychological states in a variety of ways. In a review of the literature, Cohen et al. (2000) indicate that negative life events are consistently associated with increased stress and risk of mental illness. Several illustrative examples from this body of literature follow.

Isomesta, Heikkinen, Henriksson, Aro, and Lonnqvist (1995) found that the rate at which depressed individuals in Finland commit suicide is significantly related to the perception of a negative change in their environment. Specifically, the majority of completed suicides in depressed individuals were found to have occurred after they had experienced a recent stressful event. This indicates, the authors argue, that stressful negative events are harmful—even to the extent that they prompt depressed individuals to take their own lives.

In another study, Sharma (2003) found that recent change in young rural females' lives is positively correlated with their perception of psychophysical strain, which is a risk factor for mental illness. Specifically, as participants experienced more changes, they also perceived significantly more psychophysical strain. Similarly, Spangenberg and Pieterse (1995) found undesirable life events to be negatively correlated with scores on a general health questionnaire in South African women. As women indicated that they had experienced more negative changes, they indicated that their overall health was significantly lower.

Moreover, Williams, Hagerty, Yoshua, Hoyle, and Oe (2002) found that depressed Navy recruits were significantly more likely to have experienced a greater number of life change events than non-depressed Navy recruits. Williams et al. additionally indicated that many depressive episodes are clearly associated with precipitating life events. In a similar vein, Kaltiala-Heino, Rimpela, Rantanen, and Laippala (2001) reported evidence that discontinuities in life course significantly predict depression in adolescents, above and beyond perceived social support. Taken together, the results of these—and myriad other—studies indicate that the psychological impact of negative events can be both profound and long lasting (Cohen et al., 2000).

3. Social support

3.1. The buffering hypothesis

The findings are not, however, entirely bleak; there is hope that we can overcome the negative impact of stressful events.

According to an extensive review by Wright and Bell (2003), Cohen and Wills' (1985) buffering hypothesis represents one of the main theoretical explanations of social supports' ameliorative role in the association between stress and health. The buffering hypothesis posits that social support can mitigate the impact that stress and negative events have been demonstrated to have on well-being. There are several pathways through which Cohen and Wills proposed social support affects individuals' health. The receipt of social support can reduce the impact of negative events by providing a distraction (i.e., "Don't think about your bad grade, let's go to the ballgame"), providing a solution to the problem (i.e., "You'll just study harder next time, and it'll be fine"), and by reducing the perceived importance of the event (i.e., "The test isn't such a big deal—the presentation was worth way more, and you did great!").

A large body of literature supports the buffering hypothesis' main claim (Cohen & Wills, 1985). With regard to physiological health, a study of Swedish men over age 50 revealed a large buffering effect (Rosengren, Orth-Gomer, Wedel, & Wilhelmsen, 1993). Individuals with higher numbers of stressful events in the preceding year were at substantially greater risk for mortality over the following seven-year period. However, this effect was greatly reduced by high levels of available support—individuals who reported receiving high levels of social support during and following stressful events were at significantly less risk in the subsequent follow-up period.

Childbirth has long appeared as a stressful life event in the literature (Holmes & Rahe, 1967). In a study of new mothers, Crnic and colleagues (1983) found that intimate social support moderated the effects of stress on the mother's life satisfaction. That is, mothers who received more social support were less affected by the stress that childbirth can cause.

Furthermore, in a qualitative study of the various coping strategies utilized by deployed US Army personnel, Dolan and Ender (2008) found that support from family, leadership, and fellow soldiers can serve to reduce the stressors created by the military environment. Specifically, the authors found that support is extremely effective in mitigating the effects of long separations from family; dangerous work environment; a lack of control; and demanding job duties. Overall, extant research indicates that being the recipient of social support is an effective way of lessening the negative impact that disruptive life events can have (Cohen, 2004; Cohen et al., 2000).

3.2. Computer-mediated social support groups

The proliferation of computer-mediated communication has opened new ways for individuals to connect with one another that do not include traditional face-to-face meetings. With the continued growth of the Internet as a communication tool, the ways in which individuals can access and receive social support have increased. Indeed, it has been documented that individuals are increasingly turning to their computers for social support (Wright, 2002; Wright & Bell, 2003; Wright et al., 2010). A study by Pew Internet research institute (Pew Internet & American Life Project, 2010) showed that more than 35 million individuals in the United States were members of online support groups.

Most of the literature that has looked at online support groups' efficacy in relation to individuals' health has been largely outcome oriented—that is, the research has focused on whether or not, for instance, joining an online support community aids in smoking cessation. According to Owen et al. (2010), various studies have demonstrated that participation in online support groups can have a positive impact on individuals' health outcomes. Andersson and colleagues (2005) demonstrated that taking part in a support group aimed at individuals with depression can have a positive impact.

Additionally, Barrera, Glasgow, McKay, Boles, and Feil (2002) presented data indicating that participation in an online support group significantly increased the perceived social support of individuals with diabetes. In another recent study, Freeman et al. (2008) examined the outcomes associated with an online support group for college students with psychological problems.

The bulk of the literature that investigates computer-mediated social support examines formal support groups that are convened around a specific illness or condition (e.g., HIV/AIDS) Coursaris & Ming, 2009. There are fewer studies that have specifically examined the efficacy of online support groups in relation to other types of support (e.g., face-to-face support). Moreover, limited empirical attention has gone to the examination of *informal* social support that occurs in non-face-to-face contexts. It is this gap in the literature—informal, mediated social support—that the present study was designed to address.

4. Computer-mediated communication: cues filtered out approach

As communication via computers has become increasingly commonplace, researchers have focused on ways in which computer-mediated communication differs from face-to-face interaction. The current study is grounded in several theories that collectively describe a cues-filtered-out (CFO) approach Daft & Lengel, 1986; Kock, 2004; Short et al., 1976. This approach posits that the medium through which individuals communicate affects the quality of interaction. Different theorists explain the depreciation of interactions through varied mechanisms. For example, media richness theory (Daft & Lengel, 1986) differentiates medium along a dimension of *richness,* whereas Short, Williams, and Christie (Short et al., 1976) interpret the cues-filtered-out approach along a dimension of *social presence.* Similarly, Kock's (2004) theory of media naturalness posits that because humans' natural form of communication is face-to-face, less *natural* forms of communication (e.g., telephone or email) will have a negative impact—including higher levels of cognitive effort, more ambiguity, and less physiological arousal—on message interpretation.

These theories—media richness, social presence, and media naturalness—collectively (but not exhaustively) describe a cues-filtered-out approach. They posit that face-to-face interactions maintain the highest amount of cues, and that cues decay depending on the type of medium used during communication. The cues inherent in face-to-face communication provide context, non-verbal signals, synchronicity, and require less cognitive effort in interpreting messages.

Moreover, CMC often takes place through mediums lacking auditory or visual cues, eliminating non-verbal cues almost entirely. Non-verbal cues are especially important in communication because they often supplement verbal cues through emotional support or clarification (Brehm, Kassin, & Fein, 1999). Fahy (2003) found that a lack of nonverbal cues requires individuals to employ unique social support tactics to compensate, ultimately increasing their cognitive effort. Non-verbal cues also reduce emotional ambiguity and calibrate emotional expression (Lee & Wagner, 2002). These results indicate that, compared with face-to-face communication, interactions that occur in the absence of non-verbal cues (e.g., email, telephone, or instant messaging) ought to differ systematically.

As such, Wright (2002) and Wright and Bell (2003) has noted several disadvantages for CMC use as a means for social support. Specifically, he found that CMC-derived social support lacks expressions and direct contact, and is associated with perceptions of increased hostility and delayed feedback. Similarly, in one study researchers also found that the absence of physicality and social context were two of the most cited disadvantages of CMC use in social support (Colvin et al., 2004).

However, it is important to note several advantages that CMC offers. Wright (Wright (2002) and Wright and Bell (2003)) found that CMC use for social support offers a wider range of people to contact, independent of time and space, and access to loose social ties. Other studies suggest that anonymity and collocation can offer more positive experiences for social support than face-to-face interactions (Lange, van de Ven, & Schrieken, 2003). This group of studies—documenting both advantages and disadvantages of CMC-derived social support—indicate that Internet-based support does, in fact, differ from face-to-face social support. However, little research has directly investigated, in a comparative way, how informal social support differentially affects individuals' outcomes in face-to-face versus mediated contexts.

For the purpose of this study, the CFO approach offers a theoretical guide in explaining how social support might mitigate disruptive life events differently based upon the primary form of communication used when that support was received. The differences between face-to-face communication and CMC might suggest that fewer available cues will result in a suppressed mitigation effect of social support. In other words, CMC characteristics (i.e., fewer cues) may make social support less effective in lessening the impact of disruptive life events.

5. Hypotheses

From the foregoing analysis, our argument should be clear—while the perceived amount of social support one receives is an important buffer between stressors and individuals' health, the medium through which the support is received should also be considered. Relying on the cues-filtered-out approach (Daft & Lengel, 1986; Kock, 2004; Short et al., 1976) and the buffering hypothesis (Cohen & Wills, 1985) to guide our thinking, the present study sought to examine the differences in individuals' health outcomes based upon their primary source of social support (i.e., face-to-face or mediated) following a disruptive life event. More formally:

H1. Among individuals who received social support, those who reported more support will report lower levels of disruption than those reported less support following a negative life event.

Second, combining the two relevant theoretical perspectives—the buffering hypothesis and the CFO approach—we predict that the effectiveness of social support in mitigating a negative life event's impact would be moderated by the medium used to receive support. More specifically:

H2. Individuals who used face-to-face communication as their primary means of support are buffered more than those who used CMC as their primary medium of support.

6. Method

6.1. Sample and sampling procedure

Data were gathered from a snowball sample of 126 active duty, reserve, and retired military personnel. Snowballing began with participants of convenience (i.e. known military personnel of the authors; as opposed to a pre-defined sample such as an academy or military base). The snowball technique was permitting to accumulate participants for approximately three months, at which time the researchers halted data collection. Snowball sampling is an appropriate method of data collection for several reasons. First, snowball sampling is an especially useful method for gaining access to hard-to-reach populations such as military personnel. Second, snowball sampling is useful when it is clear that bonds

or links between participants exist, such is the case for military personnel who are required to complete basic training in a group setting. Moreover, US military training focuses on teamwork and group-based exercises, ensuring a high probability of soldiers establishing both professional and social links. Third, snowball sampling is especially useful when the assumption of homogeneity is fulfilled. While it is obvious that not all US soldiers are identical, it is the case that the type of individual who joins the military may have similar traits to others who join, thus strengthening the assumption of homogeneity.

Participants responded to recruitment e-mails during the spring of 2010. The email briefly explained the nature of the survey, its requirements, and commitments (e.g. the amount of time it will take to complete). In order to participate in the study, participants had to be computer users with Internet access. Recruitment emails were sent to known military or former military personnel. The email contained a brief description of the study and a link to the survey's hosting. Upon clicking the link in the email, participants were directed to the cover page containing a more detailed description of the study as well as an informed consent form. Recipients were asked to complete the survey and forward it to any other current or former military personnel that they believed would be interested in participating.

Among the 126 total participants, ten were removed ($N = 116$): nine lacked a disruptive event and one lacked a source of social support. These participants' data were removed from the final analysis because subsequent survey questions included references to this event. Ages ranged from 18 to 70 ($\bar{x} = 43.96$, $SD = 13.93$). The sample consisted of 91 (78%) men and 25 (22%) women representing every branch of the US Armed Forces. Of these personnel, 25 (22%) were on active duty, while 83 (72%) were not. However, 108 (93%) had been on active at some point, while 8 (7%) had not.

6.2. Measures

6.2.1. Negative life event

The current survey employed Siegel's (2004) disruption measure (for a summary of questionnaire psychometrics, see Table 1). Participants were asked to describe, in detail, a negative event that affected the way they feel about themselves, their lives, relationships, or the world in general. They were also asked to describe, very specifically, the impact that the event had on their lives. Participants were also asked how long ago the event had occurred, and were told if they had more than one negative event in mind, to select the one that had the greatest impact on them currently (Siegel (2004)).

6.2.2. Impact of Disruptive Event

Following the description of the event, participants were asked how the event had affected their lives in a variety of ways. Using an expanded version of a scale developed by Siegel (2004), respondents reported on the impact of the disruptive event at the time it occurred (*retrospective disruption*) as well as how it was currently affecting them at the time of data collection (*current disruption*). The scales used for retrospective and current disruption were identical, except for the time referent (e.g., did vs. does; at the time vs.

Table 1
Means, standard deviations, and correlations among scales ($N = 116$).

Variable	$\bar{x}$	S.D.	1	2	3
Retrospective disruption	33.33	6.18	**.85**		
Current disruption	20.22	7.06	.60[*]	**.86**	
Social support impact	46.19	11.46	−.16	−.03	**.95**

[*] $p < .001$. Boldface diagonal elements are Cronbach α's.

currently). Example questions include, "How often **did** you think about this occurrence **at the time of the event**?" and "Overall, how negative of an experience is this life change **currently**? (bolding in measure items). These scales were spatially separated within the survey. *Retrospective disruption* was placed directly after the negative event description with *current disruption* placed after several other scales towards the end of the survey. A 7-point Likert scale (1 = *Not at all* and 7 = *A great deal*) was used. Cronbach's alpha for *retrospective disruption* (α = .85) as well as *current disruption* (α = .86) were calculated.

6.2.3. Impact of social support

Next, a set of measures was constructed to tap the effects of social support. In order to aid recall, questions were broken down into basic steps. Participants were asked to think of the person that provided the most support following the event and indicate her or his initial(s). Data were collected on the relationship to that person, as well as how far away that person lived at the time the event occurred. To measure the perceived effects of social support, a measure was constructed based on the 12-item version of the General Health Questionnaire (GHQ-12) Goldberg et al., 1997. The GHQ-12 is a common means of assessing overall mental well-being, and is often used to screen for likelihood of developing psychiatric disorders or many kinds. It covers areas such as anxiety, social withdrawal, depression, and other somatic symptoms. For the purposes of the current study, questions were altered slightly to inquire on the effects of interacting with a person for the purposes of receiving social support. For example, the question, "[I have] felt capable of making decisions about things" was changed to, "I was more able to make decisions after the interaction." Participants were asked about the support they received following the negative event. Specifically, respondents were asked about the support they received during the interaction with the main support person that they had previously listed. A seven-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*) was used. Several items from the GHQ-12 were dropped entirely because they could not be adapted to the social support interaction framework. In addition, an item was added to judge respondents' satisfaction with the support received from the interaction. Cronbach's alpha (α = .95) was calculated for the scale.

6.2.4. Technology use

Next, we constructed a single item that assessed which form of communication participants primarily used to receive social support following their disruptive life event. Participants were asked to think specifically about how they received support and from whom, and then were asked to select the form of communication most used during the disruptive event: face-to-face [high cues] or computer-mediated communication [low cues]. The face-to-face category includes conversations or other actions that occurred while the respondent and support provider were physically in the same location. The CMC category included telephones, social networking, email, forum boards, or chat programs. An "other" technology category was provided as well, but participants were instructed to use it only if the technology they used did not fall into the categories provided.

7. Results

Several statistical analyses were then conducted to test the two main hypotheses. First, it was predicted that disruption would be moderated by social support such that participants who were impacted more by social support would report less disruption currently than those who were impacted less (H1). Next, it was predicted that the relationship between disruption and time would

be further moderated by the type of technology employed while seeking social support; specifically, we predicted that face-to-face interactions will result in more buffering, whereas CMC-derived interactions will result in less buffering (H2). In order to test these hypotheses, data were analyzed in three steps. First, a paired-sample *t*-test was used to examine the general effect of disruption over time (retrospective vs. current levels of disruption). Next, we decomposed the general effect of temporal disruption by conducting a repeated-measures ANOVA to assess the moderating role of social support impact on disruption over time. Lastly, a second repeated-measures ANOVA was run to examine the effect of social support medium on temporal disruption, above and beyond the effect of social support impact.

Preliminary paired *t*-tests were utilized to determine the effect of disruptive events over time. Results indicate a main effect between retrospective disruption ($\bar{x}$ = 33.33, SD = 6.18) and current disruption ($\bar{x}$ = 20.22, SD = 7.06), $t(115)$ = 23.72, $p < .001$, suggesting that over time disruptive events have less of an impact when recalled by participants. Building upon this prediction, Cohen and Wills' (1985) buffering hypothesis holds that this relationship should be moderated by the impact of the social support participants received; similarly, following from the CFO approach, this relationship should also be moderated by the medium through which they receive this support.

Therefore, in order to test the buffering hypothesis (H1), a repeated-measures ANOVA was conducted in an effort to decompose this generalized relationship and assess the differences between people who were impacted high or low by the social support they received during the reported disruptive event. Repeated-measures ANOVA was utilized for analysis—rather than hierarchical regression—due, in part, to our violation of participants' independence when recalling emotional states over time. Repeated-measures ANOVA allows researchers to partition subjects' interdependence imposed by this violation (Howell, 2007). Howell further notes that the main advantage to using repeated-measures designs is "the ability to use a common subject pool…leaving error components independent from treatment" (p. 440).

The length of time between participants' retrospective emotions and current emotional state, the physical distance from participants' source of support, and the type of person who gave this support (e.g., family member vs. friend; co-worker vs. acquaintance), were entered into the model as covariates in order to eliminate underlying or potential biases. A median-split was performed on the variable representing the impact of the interaction with participants' stated source of social support (high vs. low impact) and entered into the model as a between-subjects factor. A multivariate analysis indicates a statistically significant interaction, where $F(1, 111)$ = 3.97, $p < .05$, η^2 = .035 (see Fig. 1). Consistent with the buffering hypothesis, this result suggests that participants who were impacted more by the social support they received reported lower levels of disruption than those who were impacted less by their supportive source. Additionally, 3.6% of the total variance in temporal disruption can be explained by the impact of social support.

In order to more closely inspect this interaction, a simple effects analysis was conducted with regard to social support impact. Results indicate no statistically significant difference between participants in the high- or low-impacted disruption categories during *retrospection* (see Fig. 2).

However, there was a significant difference between high- and low-impacted participants within *current* disruption levels[1] (see Table 1).

In support of H1, the previous tests suggest that while the impact of a disruptive event decreases over time, this may be partially dependent upon the social support one receives surrounding the event.
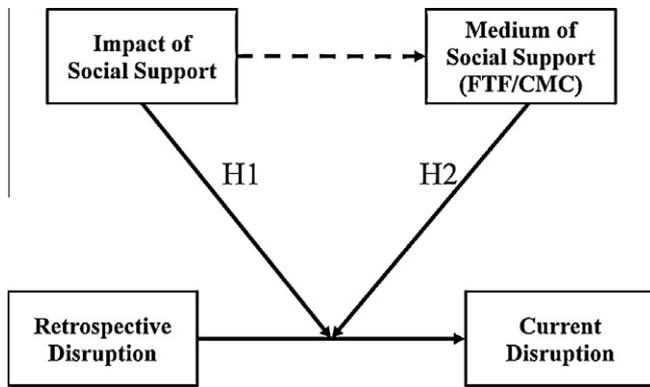
Fig. 1. Hypothesized model of informal social support.

The second hypothesis extends this presumption and posits that it may not necessarily be the impact of social support, but rather the primary medium through which this support is received that is essential in mitigating the impact of a disruptive event. Thus, to test H2, a second repeated-measures ANOVA was conducted controlling for all previous variables as well as the impact of social support. In order to best attribute the unique impact of communication type on disruption that is distinct from social support, Communication Type was entered into the model as a between-subjects term. Results indicate a statistically significant Time × Communication Type interaction (see Table 1 for means, standard deviations, and sample size), where $F(1, 110) = 6.75$, $p < .05$, $\eta^2 = .058$ ∗∗∗(see Fig. 3). This suggests that participants who used face-to-face communication to garner social support following their disruptive event felt less disrupted over time, when compared with those who employed electronic means Additionally, 5.6% of the variance in temporal disruption is explained by communication type.

A final simple effects analysis was conducted testing the mean difference between Communication Type *within* each recalled disruptive state (retrospective vs. current). Results indicate that during participants' retrospective recall of their disruptive levels there appeared to be no statistically significant difference between those who utilized face-to-face communication over CMC. This suggests that, on average, participants recall being approximately equally disrupted during the time of the event (see Table 3).

More importantly, and consistent with H2, participants who used face-to-face communication reported currently feeling less disrupted then those who used electronic media (see Table 2).

8. Discussion

As more people turn to the Internet for social support, it is increasingly important to examine the implications of computer-mediated communication on mental health (Freeman et al.,

2008), especially given alternative findings that have suggested a negative impact of Internet use—particularly regarding social isolation, stress, depression, and loneliness (Kraut et al., 1998).

In this vein, the present research attempts to substantiate the claim that, in a military population, during times of disruption, the way in which social support affects individuals depends not only upon the perceived amount of support one receives, but also the *medium* through which they receive it. Moreover, whereas past studies have looked at formalized, group-based support, the current endeavor seeks to examine informal, inherent social support received via mediated channels. This study seeks to move Cohen and Wills' (1985) buffering hypothesis into the computer-mediated communication literature, as well as test the applicability of the cues-filtered-out approach in social support interactions.

Furthermore, this investigation set out to understand the differences that exist between informal, non-group-based mediated social support and face-to-face social support. Various studies have sought to examine the differential effects between on- versus offline communication on mental health. Prior research suggests that Internet use can decrease the impact of negative life events and increase the perception of social support (Amachi-Hamburger & Ben-Artzi, 2002; LaRose, Eastin, & Gregg, 2001).Overall, results suggest that, as participants reported higher levels of social support during the time of their disruptive event, they felt better than those who received less social support—regardless of who the person was in relation to the participant, how far away that person lived, or how long ago the event occurred. Our analysis indicates that participants who reported receiving more social support following a disruptive event were significantly less impacted by the event than those who received little or no support. This overall finding provides further empirical support for Cohen and Wills' (1985) buffering hypothesis, which states that social support will mitigate the impact of negative life events.

Furthermore, results also indicate that regardless of the perceived impact of social support, participants' disruption levels were further lessened by the primary medium through which the communication took place. When compared with those who reported receiving support via telephone or the Internet, individuals who indicated that the bulk of their social support came via face-to-face communication reported feeling significantly better following a supportive interaction. This finding suggests that, while social support is critical in buffering negative life events, it is also important to choose the most appropriate medium through which to receive such support. This sets up an interesting dichotomy—specifically, social support serves an important function in ameliorating the potentially deleterious effects of stressful experiences,
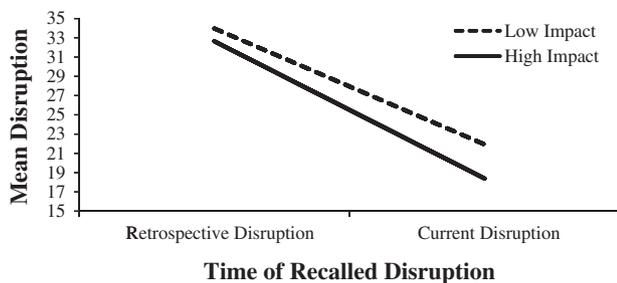

Fig. 2. Mean disruption as a function of social support impact.

Table 2
Means, SE, and CI, for participants' recalled state by social support impact. (N = 116).

Recalled State		$\bar{x}$	S.E.	C.I.
Retrospective disruption	Low impact	33.97	0.81	32.37–35.56
	High impact	32.64	0.83	30.99–34.30
Current disruption	Low impact	21.93	0.90	20.14–23.72
	High impact	18.39	0.94	16.54–20.25

Table 3
Means, SE, and CI for participants' recalled state by communication type. (N = 116).

Recalled State		$\bar{x}$	S.E.	C.I.
Retrospective disruption	Face-to-face	33.44	0.76	31.96–34.94
	Computer-mediated	33.12	1.10	30.94–35.29
Current disruption	Face-to-face	19.16	0.85	17.56–20.88
	Computer-mediated	22.24	1.22	19.82–24.66

just as Cohen and Wills' (1985) buffering hypothesis would predict. However, social support may be more or less effective in buffering individuals against disruptive events based upon the medium through which it is received.

Understanding how communication channels differ in providing comfort has profound implications not only on the general population, but particularly for the current sample of military personnel. Deployed soldiers often have the option to communicate to family abroad or their immediately available network of fellow soldiers. This analysis shows that during extreme negative life events, soldiers that use face-to-face communication, rather than computer-mediated communication channels, perceived lower levels of disruption over time. This finding suggests that military personnel, on average, may dampen the effects of negative life events more effectively through face-to-face communication rather than other media.

In general, the current research provides several contributions to the literature. First, we extend Cohen and Wills' (1985) buffering hypothesis into the realm of CMC by providing evidence such that while more social support diminished disruptive life events, the size of the buffering partially depends upon the medium through which support is received. Second, this study examines the role of *informal* social support rather than formal or group-based support systems, an area that has received much less attention recently, particularly with the growth of online support websites. Third, we examined a particularly unique sample (i.e., US soldiers), who are exposed to distinct types of disruptive life events. This research provides insight into the types of communication that may best suit individuals in highly disruptive environment. In other words, during a disruptive event soldiers may seek FTF support – fellow soldiers, superiors, family, or friends – rather than mediums which deprive them of necessary social cues (e.g. online).

8.1. Limitations

This paper provides a platform to extend Cohen and Wills' (1985) original buffering hypothesis to include findings from the computer-mediated communication literature, and more specifically, military personnel. Moreover, the present research serves as further support for CFO approach. A limitation of the current analysis is that participants' computer-mediated communication was assessed in a grossly generalized fashion; subsequent studies should aim to dissect the CMC "black box" by breaking up analyses into individual communication types or to examine congruencies between participant's ideal communication and what they used during the disruption. A second limitation in the current study is gender inequality. The current sample overwhelmingly included males. It may be the case that the current research only applies to strong- or weak-tied relationships. Thus, females may be differentially affected by communication mediums versus males. A third limitation is the inability of the current research to parse out generational effects. Social networking and Internet-related
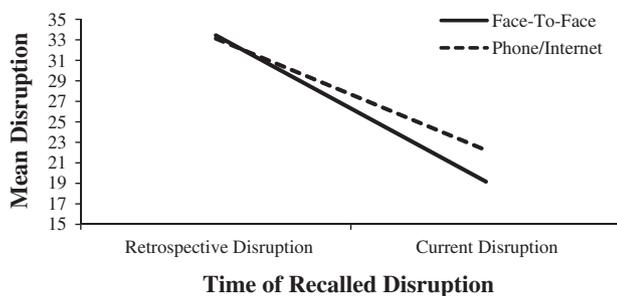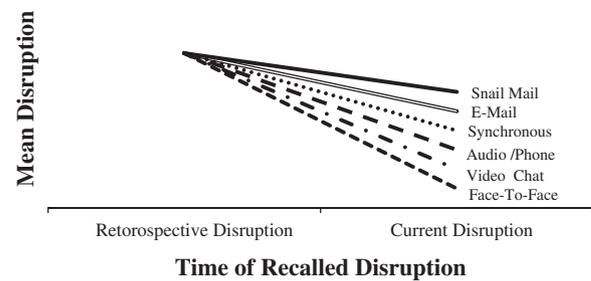
Fig. 4. Theoretical disruptive effect across communication medium.

communiqué are relatively new social norms. Younger soldiers may be better equipped at communicating effectively over different communication mediums than older soldiers who have not adopted these new technologies. These limitations, however, provide exciting new opportunities for future research endeavors in military research.

8.2. Directions for future research

The current research provides a critical step in understanding three important research domains, mainly social support, CMC, and disruptive life events. In accordance with the above-mentioned limitations, future studies may explore the purpose of the social support source. In other words, it may be the case that informative support affects individuals differently than emotional support and may also interact across mediums (i.e. online vs. FTF) and gender. In the present study, we only assess the effects of face-to-face versus all other communication types (i.e., telephone, email, social networking, *etc.*). Future research efforts ought to assess the differential effects of varied types of non-face-to-face media. Put another way, future research could strive to unravel the effects of CMC on received social support along a continuum rather than a dichotomy. For instance, it would be telling to examine the role that social support plays in buffering against negative experiences when it is received via online support groups versus email versus instant messaging. Expanding upon the current research, future research may limit sampling to not only military personnel but also currently deployed personnel. Deployed soldiers are often exposed to extreme disruptive events; by unraveling further the dynamics that govern effective social support, practitioners (i.e. commanders) in the field can design support systems that provide the most appropriate outlets to soldiers.

According to CMC theories such as media naturalness, media richness and social presence, future researchers should expect to see the impact of negative life events mitigated less as the channel through which individuals communicate deviates further from face-to-face communication (see Fig. 3). This is precisely what our preliminary results show, and the literature would benefit from future research that more finely parses out the different communication types. Fig. 4 represents a theoretical model of the differential impact that might be expected from various technologies.

9. Conclusion

The current research sought to build upon strongly grounded theoretical bases by extending the buffering hypothesis to include computer-mediated communication and modern communication devices. Given the present findings, the social support literature might benefit from consideration of an additional variable—the medium through which support is received. The data from this research seem to suggest that, as years of empirical work indicate, the perceived amount of social support one receives following a

Fig. 3. Mean disruption as a function of communication type.

traumatic event matters. However, the present findings also indicate that the medium through which social support is received affects its effectiveness in lessening a disruptive event's impact.

Appendix A

A.1. Disruptive life event

I'd like to ask you about any recent life events/changes you have experienced. Has anything negative, possibly unexpectedly, occurred that changed how you feel about yourself, your life, your relationships, or the world in general? Please describe one negative life change, event, or realization you believe is having the largest impact on your life and your feelings. In other words, what negative life change, event, or realization have you experienced that has had the largest change on how you currently feel, behave, and/or see the world. This life change, event, or realization can be concerning yourself, relationships, college life, career, etc. If there is more than one negative life change, event, or realization describe the ONE you believe has MOST impacted you, how you feel, and/or how you see the world. One way to think about which has had the greatest impact is to think about your thoughts over the past couple of weeks. What are these thoughts related to? Is there something you worry or stress about a lot? What has had the strongest negative impact on your current happiness level?

Please describe this event
Describe the impact that this event had on your life:
How long ago did this event occur? *Select the time that best represents how long ago this happened.*

1 day ago
1 week ago
1 month ago
3 months ago
6 months ago
1 year ago
2 or more years ago

A.2. Impact of disruptive event

(Not at all = 1; 7 = a great deal)
*For the following questions, please think about how this event affected you **at the time of the event**.*

How much of an impact did this event have on you **at the time it occurred**?
How much were you able to think about other things **during the time of this event**?
How often did you think about this occurrence **at the time of the event**?
How often **did** you think about things that occurred because of the event?
How much of an impact did this occurrence have on you **at the time of the event**?
Overall, how negative of an experience was this life change **at the time of the event**?

*For the following questions, please think about how this event affects your **emotional state right now**.*

How much of an impact does this event have on you?
How much are you able to think about other things?
How often do you think about this occurrence?
How often do you think about things that occurred because of the event?

How often do you become emotional when you think about this occurrence?
Overall, how negative of an experience is this life change?

A.3. Supportive source

Think about the person that provided the most support following this event. Please write that person's first initial below.
Is [name] a friend, family member, romantic interest, acquaintance, or coworker?

Friend
Family member
Romantic Interest
Coworkers
Acquaintance

We would like to know how long it would take to see [name] face-to-face. In other words, how far away do you live from this person?

Currently lives in the same household
Walking distance
Within an hour's drive
More than an hour's drive but less than a day's drive
One to two day's drive
More than 2 days drive or must fly

A.4. Impact of social support [general health questionnaire-12]

Next, I'd like to ask you about the support you received following the event you mentioned above. Please think about the total amount of the social support that you received in the interaction with [name].
The following questions assess the impact of the interaction you mentioned above. Please rate the extent to which you disagree/agree with the following statements.
(1 = strongly disagree; 7 = strongly agree)

I felt better after this interaction.
I felt less anxious after this interaction.
My stress level decreased after this interaction.
After this interaction, I worried less about the event.
I was able to sleep better after this.
I felt better about myself after this.
I was more able to make decisions after the interaction.
I could concentrate better after the interaction.
I felt satisfied with the support that I received from this interaction.

A.5. Technology use

*Now, please think specifically about how you received emotional support from [name]. People receive support through different ways. Below are two different ways people commonly receive support (e.g., Face-to-face, phone, internet/text message). Please tell us which method you **primarily** used when receiving support from this person*
Remember, only think about the support that you received following this event.
The primary medium my social support took place was:

Face-to-face (this includes conversations or other actions that occurred while you and [name] were physically in the same location).
Computer-mediated communication (this includes telephones, social networking, email, forums, or chat programs).
Other—.

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