Transition, stress and computer-mediated social support

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ABSTRACT

This review of literature from multiple disciplines argues that the Internet is useful both in communicating support, and in the rapid reestablishment of socially supportive peer networks, when an individual's support needs change following a transition. We extend prior typologies of transition by identifying common features and outcomes of transition. We subsequently describe how transition involves a loss of social support networks and social capital, leading to increased stress and decreased wellbeing. Finally, we examine the features of computer mediated social support, and how those align with support needs following a transition. This paper provides a theoretical underpinning and a common language for the study of transition and its associated stress. The paper also suggests that computer-mediated social support may in some instances be superior to available face-to-face support options for managing the transitional factors affecting stress.

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0. Introduction

Life is full of transitions. A common research thread is that transition is generally accompanied by a period of increased stress and decreased wellbeing (Section 1) due to the disruption of and adjustment to norms, expectations, social networks, and social capital (Section 2). Various forms of social support can help buffer the effects of such disruptions, or directly improve outcomes (Section 3). This review identifies how computer-mediated social support (CMSS) may provide and obtain such social support to manage stress during transition (Section 4).

For this review, we explicitly searched, across multiple disciplines, for a few exemplary literature reviews in the areas of transition, stress and CMSS along with studies in each of four common transition domains. We evaluated the initial search results, including their references, to help refine subsequent search terms and find better exemplars. Table 1 presents the domains and definitions within the areas of transition/stress and CMSS, and the search terms used to find potentially relevant articles.

1. Transition: Definitions and outcomes

1.1. Transition

Transition is the process of change between one previously established context and another, and adaptation to new contextual norms and outcomes that ensue. Context is defined as roles, expectations, conditions, relationships and environments. Like Kralik, Visentin, and van Loon (2006), we emphasize the notion of transition as a psychological *process* of reorientation, transformation, and adaptation, and development of new identities and new ways of living.

1.2. Transition domains

Prior conceptualizations and reviews organized transition into four domains: health-illness, developmental, organizational, and situational (Kralik et al., 2006; Schumacher & Meleis, 1994). Based upon our initial search results, and to make the categories more fitting to social science research, we generalized Kralik et al.'s health-illness domain to *individual*; developmental to *familial*; organizational to *community*; and situational to *societal*. *Individual* transitions are transitions that occur principally to or within an individual, and their responses in health or illness contexts. Articles emphasized health-related changes in appearance, identity shifts, mental health and implications of illness diagnosis. *Familial* issues included life event transitions that occurred within the confines of a "family" structure, as when they experience the changes that occur during the life cycle, such as becoming a parent. Articles discussed the transition to parenthood, marriage, children, step-children and divorce. *Community* transitions focused on broader changes to an individual's primary community or small-scale setting including movement through the education system, changes in occupation/profession, and starting a first career. *Societal* articles covered large social, political or economic changes, or disruptions

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Table 1
Domains and search terms for articles on transition, stress, and online social support.

Domains Transition, stress or support relating to...	Search terms for transition and stress	Search terms for online social support
1. **Individual**/health-illness ...the responses of individuals and families in health or illness contexts	• Transition + diagnosis of cancer + review • Adapting to an illness + literature review • Transition to accepting a stigma + review • Transition to living with chronic illness + review • International transition and stress + review	• Internet + social support + marriage • College + Internet + transition + social support • Internet + social support • Online social support or Internet-mediated social support or computer-mediated social support + diagnosis or disease • Online social support + marriage • Internet + social support + menopause • Internet + social support + relocation • Online social support + relocation • Online social support + marital conflict
2. **Familial**/developmental ...individuals when they experience the changes that occur during the life cycle, such as becoming a parent	• Divorce + stress + process + review • Step-parent + interactions and adjustment + review • Transition + divorce + stress + review • Transition + marriage + stress + review • Transition + parenthood + review • Transition + parent-role + review	• Online social support + marriage • Internet + social support + parenthood • Internet + social support + pregnancy • Online social support + marriage
3. **Community**/organizational ...various educational and professional roles, such as the transitions of graduate nurses	• Transition + career + review • Transition + professional role + review • Transition + college + review • College transition + review	• Internet + social support + study abroad • Internet + social support + child leaving home • Online social support + culture shock • Online social support + acculturation
4. **Societal**/situational ...changes in the social, political or economic context	• Adjustment after natural disaster + review • International transition and stress + review • Stress + transition + natural disaster + review • Stress + transition + terrorist attack	• Internet + social support + relocation • Internet + social support + 9/11 • Internet + tragedy + social support + natural disaster • Internet + social support + culture

to settings on a larger scale like 9/11 and natural disasters, or more positive changes such as adapting to a new culture during travel.

1.3. Transition characteristics

Articles in the four domains identified five main characteristics of transition that may influence the degree to which a transition is perceived as a threat and fosters stress: anticipated vs. unanticipated; voluntary vs. involuntary; normative vs. disruptive; positive vs. negative; and independent vs. interdependent (trigger events) (Table 2).

The first distinction is between *anticipated* and *unanticipated* transitions. Anticipated events are transitions that individuals are likely to expect, or to know about beforehand. These transitions are likely to produce less stress than transitions that occur unexpectedly and without prior warning. Most of the transitions in the familial and community domains (e.g., parenthood) were likely to be anticipated, so while those transitions were associated with elevated or chronic stress, the corresponding stress was less than stress corresponding to unanticipated transitions. Unanticipated transitions, such as the sudden loss of a family member, are likely to produce the same chronic stress of adjustment punctuated at the front end by a sharp, acute stress. Although major health problems occur fairly frequently, they are typically unanticipated, and constitute significant transitions. For example, Hammel (1992) notes the process and consequences of traumatic spinal cord injury, describing paralysis resulting from spinal cord trauma as presenting "a sudden, overwhelming threat to the individual's safety and constitutes a crisis event" (p. 318).

The degree to which a transition is viewed as *involuntary* or *voluntary* is likely to affect one's readiness and ability to adapt, thereby influencing levels of transition-related stress. This distinction is an extension of Ogbu's (1998) classification of autonomous, voluntary or involuntary immigrants, each context differentially affecting both an immigrant's perception of belonging, and his or her social acceptance. Transitions that are involuntary (such as sudden cancer diagnosis), irrespective of their outcomes, are at least initially difficult to accept and manage. Voluntary transitions are transitions in which the individual can exhibit agency, and these transitions were interpreted as less stressful on average. Voluntary transitions in our articles were concentrated primarily within familial and community transitions, and included educational advancement, getting married, or having children.

Certain transitions constitute *normative*, natural, expected, or required stations on an individual's life course trajectory (such as marriage followed by parenthood). They may be associated with more manageable transitional stress, often facilitated by socialization and ritual which decreases disruption during the transition. Even normative transitions can cause stress. Consider the normative and common passing through educational stages. In one longitudinal study, self-esteem and self-perceptions of ability in four academic domains (math, English, social activities and sports) were assessed in the transition from elementary school (6th grade) to junior high (7th grade). All declined during the transition to middle school, and while self-esteem and social ability increased somewhat by spring semester of 7th grade, both remained lower following the transition to junior high (Wigfield, Eccles, Mac Iver, Reuman, & Midgley, 1991). Some students never regain their pre-transition levels of self-efficacy (Simmons, Rosenberg, &

Table 2
Primary characteristics of transition, by domain.

Domain	Individual/Health					Family/Development								
Characteristics of transition	Golzynski, Hoerr, and Kallen (1999)	Horgan and MacLachlan (2004)	Saunders (2003)	Telford et al. (2006)	Whyte and Smith (1997)	Ahrons (1980)	Glade, Bean, and Vira, et al. (2006)	Bray and Berger (1993)	Cox (1985)	Condon et al. (2004)	Frese and Howell (1982)	Kitson, Babri, and Roach (1985)	Morris and Carter (1999)	Nystrom and Ohrling (2004)
Anticipated	X					X	X	X	X	X				X
Unanticipated		X	X	X	X						X			
Voluntary						X	X	X	X	X	X	X		X
Involuntary	X	X	X	X	X									
Normative	X						X		X	X				X
Disruptive		X	X	X	X	X		X			X			
Positive	X						X	X	X	X	X			X
Negative		X	X	X	X	X								
Independent														
Interdependent "Trigger"	X	X	X	X	X	X	X	X	X	X	X			X

	Community/Organizational						Societal/Situational				
	Cutler and Radford (1999)	Latack (2004)	Latack and Dozier (1986)	Mattanah et al. (2010)	Wendlandt and Rochlen (2008)	Wigfield et al. (1991)	Black, Mendenhall, and Oddou (1991)	Galea, Nandi, and Vlahov (2005)	Hoffman and Kruczek (2011)	Knudsen, Roman, Johnson, and Ducharme (2005)	Perry (1983)
Anticipated	X	X		X	X	X	X				
Unanticipated			X					X	X	X	X
Voluntary	X	X		X	X	X	X				
Involuntary			X					X	X	X	X
Normative	X	X		X	X	X					
Disruptive			X				X	X	X	X	X
Positive	X	X		X	X	X	X				
Negative			X					X	X	X	X
Independent											
Interdependent "Trigger"	X	X	X	X	X	X	X	X	X	X	X

Rosenberg, 1973). Events that go against the linear trajectory of the life course, like marital dissolution (Amato & Previti, 2003), constitute *disruptive* transitions. Research on later passages through educational stages shows that over 40% of entrants do not complete college, with over half of those leaving within the first 6 weeks (Mattanah et al., 2010). Challenges in this transitional period include responding to the disruption of existing social networks, building new networks, completing more difficult schoolwork, experiencing loneliness, managing newfound autonomy, family separation and dealing with new social demands and behaviors.

The characteristic that has received the most attention in the literature on transition and stress is whether a transition can be viewed as *positive* or *negative*. Positive transitions were changes that could be viewed as desirable. Desirable changes ranged from individual level transitions such as weight loss, to familial transitions such as marriages and the birth of a child. Community level changes also included positive changes such as occupational advancement. Many transitions, however, such as illness or societal crises, are negative transitions. "Undesired, unscheduled, non-normative, and uncontrolled" transitions are the most harmful (Pearlin, 1989, p. 244).

The final distinction is between *independent* and *interdependent* transitions. Interdependent transitions or *trigger events* are (primary) transitions that generate other (secondary) transitions, or even "constellations of secondary problems" (Pearlin, 1989). For example, a natural disaster such as Hurricane Katrina in New Orleans in 2005 can lead to the displacement of a family, cessation of education, or loss of employment – each constituting a transition in community structure. The disaster may also result in the loss of family members, or the separation of families – changes to the family structure. This cascading of events is likely to have a compounding effect – leading to greater levels of stress in interdependent transitions than would be present in a transition that occurred in isolation.

The categorization of transitions as dichotomies is done for purposes of clarity. However, in developing a framework for the interpretation of transition and transitional stress, each of the kinds of transition really constitutes a continuum, and each of the characteristics may be more or less interrelated.

1.4. Transition outcomes

In all, the reviewed articles discussed 13 major shifts or changes following transition. Table 3 lists the principal outcomes of transition according to the articles reviewed.

1.4.1. Stress

The first major grouping includes *negative emotions*, especially elevated stress (including depression and anxiety), depressed feelings of wellbeing, and depressed self-concept. Some articles spoke directly to elevated stress levels resulting from transitions (such as trying to adapt to a new culture; consider the older literature on culture shock – Oberg, 1960), while others focused primarily on feelings of wellbeing or changes to self-concept (such as one's abilities in math or sociability when moving from elementary to junior high school). Other articles focused on multiple effects. For our purposes, each of these outcomes is treated as a proxy for transitional *stress* – and at least some adjustment stress was present in each of the transitions under study.

Given the inherent nature of stress within transitions, what is stress? And is stress endemic to all transition? Lazarus and Folkman (1984) conceive of stress as a three-stage process. The first stage consists of the *initial evaluation of an event as either threatening or non-threatening*. If the event is interpreted as threatening, the individual then *inventories coping tools* at his or her disposal to handle the event. *Coping* is an individual's cognitive

and behavioral efforts to manage a specific demand (external or internal) that is overwhelming the individual. Next, the individual conducts a *secondary appraisal of the potential threat* in light of available coping resources. Stress occurs when an individual faces demands for which s/he lacks an automatic coping response. During or after a transition, which encompasses new demands and challenges, it will take a person time to identify, anticipate and develop coping responses intended to respond to those demands. Use of these resources would not prevent the experience of transitional stress, but rather would affect the speed at which an individual recovers or returns to the state of wellbeing appropriate to the new situation.

Earlier measures of *stress* were based on reported number of life events (transitions) experienced within a given period of time, and the degree to which each required adjustment of roles, habits and expectations. The Social Readjustment Rating Scale (SRRS; Holmes & Rahe, 1967) used clinical and survey data to assign relative values to different (both positive and negative) life transitions in terms of the amount of stress they caused – noting even then the increased psychological and physical symptoms associated with all transitions.

However, Pearlin (1989), among others, has rejected both this measurement approach and the notion that all transition is potentially harmful (stressful) simply because it requires readjustment. He showed how most "life events" are embedded in larger sociological contexts and influences (see also George, 1993), so that structural and social arrangements create patterned and situated distribution of stressors, stress mediators, and stress outcomes (Pearlin, 1989). According to critics of the SRRS scale, and as noted above, much transition is normal (within a normative trajectory), may even be desirable and healthy, and does not necessarily generate stress.

Nonetheless, even when the net changes following completion of a transition are positive, our review of transition literature shows that the actual *process* of adjustment to new norms and expectations is generally accompanied by stress. There is clear evidence from the literature reviewed that even normative, positive, anticipated and voluntary changes can induce considerable stress, as exemplified by first time fathers (Condon, Boyce, & Corkindale, 2004). However, these transitions are likely to induce less stress than negative changes such as job loss, demotion, or cessation of studies.

1.4.2. Other outcomes

Other typical changes were associated in the articles with transition, such as in an individual's *roles*, *identities*, *and expectations*, *emotions*, *relationships* and *environments*. The most frequent outcome of transition was identity shift, followed by relationship changes and new demands. The least frequent outcomes were limited mobility, fear, and instability. Over half of the characteristics appeared in all four domains, while fear and limited mobility were discussed in only two of the domains.

1.4.2.1. Roles, identities, and expectations.

At the most basic and fundamental level, transition can create or require shifts in a person's identity and self-perception. Telford, Kralik, and Koch (2006) discussed labels of "acceptance" and "denial" as potentially damaging to individuals diagnosed with chronic disease, suggesting that a fragile sense of self-identity may make those living with chronic conditions more likely to internalize negative information associated with such labels, thereby preventing effective disease management. Familial transitions such as marriage or parenthood, along with community transitions such as educational advancement or changing jobs, may also require an individual to adopt new roles leading to further shifts in identity. For example, becoming a parent

Table 3
Primary outcomes of transition, by domain.

Domain	**Individual**/Health					**Family**/Development								
Outcomes of transition	Golzynski et al. (1999)	Horgan and MacLachlan (2004)	Saunders (2003)	Telford et al. (2006)	Whyte and Smith (1997)	Ahrons (1980)	Glade et al. (2006)	Bray and Berger (1993)	Cox (1985)	Condon et al. (2004)	Frese and Howell (1982)	Kitson et al. (1985)	Morris and Carter (1999)	Nystrom and Ohrling (2004)
Stress	X		X	X	X	X	X	X	X	X	X			X
Decreased wellbeing		X			X				X	X				X
Depression	X	X	X	X	X	X	X			X				X
Anxiety		X	X	X	X		X			X				
Decreased self-esteem	X	X	X	X	X		X	X			X			X
Responsibilities – new			X		X					X	X		X	X
Role overload	X									X			X	
Demands – new					X	X								X
Expectations	X	X				X				X			X	
Financial change										X	X	X	X	X
Identity shift	X	X	X	X			X	X	X	X		X	X	
Relationship shifts	X	X	X		X	X	X			X				X
Isolation	X	X	X				X							
Limited mobility		X			X									X
Instability			X											
Fear	X													
Stigmatization	X	X												
Uncertainty					X	X								X

	Community/Organizational						**Societal**/Situational				
	Cutler and Radford (1999)	Latack (2004)	Latack and Dozier (1986)	Mattanah et al. (2010)	Wendlandt and Rochlen (2008)	Wigfield et al. (1991)	Black et al. (1991)	Galea et al. (2005)	Hoffman and Kruczek (2011)	Knudsen et al. (2005)	Perry (1983)
Stress		X	X	X	X		X	X	X	X	X
Decreased wellbeing		X					X	X	X	X	X
Depression	X	X	X	X			X	X	X	X	X
Anxiety	X	X	X	X			X		X	X	X
Decreased self-concept	X		X	X		X	X		X		
Responsibilities – new	X	X					X		X		

can lead to more traditional gender roles, a focus on "parent" identities, or a withdrawal from "partner" roles (Glade et al., 2006).

Intimately tied to new roles, identities are new demands and responsibilities. *Demands* are short-term duties or roles that a person adopts temporarily in order to manage a transition. Families of a loved one with an illness are faced with new demands, such as how to help and support their sick family member, and how to manage their new roles as caregivers, for which they may have no – or limited – coping strategies. *Responsibilities* are permanent or long-term duties or roles brought about by a transition, but likely to extend beyond the transition itself. Responsibilities change in association with one's own or another's illness. Just being sure to take one's multiple medications, or follow a specialty diet, requires unfamiliar habits and attention that may cause stress or decreased wellbeing.

Finally, *expectations* involve an individual's ability to anticipate the outcome of his or her actions. As expectations are based on the familiar, novel situations and interactions associated with transition inhibit an individual's ability to anticipate outcomes and increase the likelihood that an individual will face demands for which he or she lacks coping resources. For example, Wendlandt and Rochlen (2008) suggest that students entering the workforce have very little knowledge of workplace culture, and that this unfamiliarity with workplace culture leads to lower levels of job satisfaction and increased turnover for new graduates in the first few years of employment (see also Van der Velde, Feij, & Taris, 1995).

1.4.2.2. Emotions. Transition may bring about emotional outcomes such as frustration, anger or sadness. One common theme that ran across multiple dimensions of transition was *uncertainty*. Questions about getting along with fellow students and teachers, coworkers, managers and customers accompany uncertainty about how well one will perform in these new contexts. Saunders (2003) discusses feelings of instability when caring for a child with a severe mental illness, and Latack and Dozier (1986) mention instability when discussing employment termination as a career transition. Natural disasters, both during and afterwards, create and spread uncertainty. Major concerns include whether one's house is still standing, if friends and family are safe, what is current and credible information, and how one will manage the consequences (Afifi, Felix, & Afifi, 2012).

1.4.2.3. Relationships. *Relationship shifts* may be a secondary transition following one of the other transitions. Such shifts were a common theme discussed in a majority of the 20 articles, across each of the four transition domains. One extreme case of relationship shift is feelings of isolation, found in six articles across three domains (*individual*, *familial* and *community*). Shifts in individual health, or family situation might result in previously supportive peer networks being reduced or rendered ineffectual, while community and societal transitions such as international migration might leave an individual physically separated from their previously established networks of support. This separation from peer networks can lead to increased stress, decreased wellbeing, depression, anxiety and increased psychosomatic symptoms.

1.4.2.4. Environment. Several outcomes of transition have to do with how an individual is able to interact with their environment. Changes in *financial state* may serve to restrict or broaden an individual's environment by limiting (or providing) the resources necessary to do so, and can happen in individual, familial, community and societal transitions. For example, a student who goes away to college may face not only difficulties in the amount of disposable income available, but also challenges in how to manage finances. Conversely, the transition from university to employment, or the transition from one job to another, generally involves a positive

change to individual finances. Transitions may also restrict an individual's environment (and identity) by *limiting mobility*. Some illnesses make it unwise, difficult or impossible to go outside or to move about; individuals may have their driving license revoked, or must be accompanied by a caregiver, thereby losing their independence as well as their mobility. Limited mobility is inherent in natural disasters, as roads and airports can close, affecting travel into and out of disaster boundaries.

2. Disruptions to social capital and social support during transitions

Dare and Green (2011) highlight the role of one's social network (including friends, colleagues, acquaintances, and family members), in providing access to social capital and social support, to help manage transitional outcomes. Different social networks, generally reflect their larger structural context, and thus different resources for and types of social support (Pearlin, 1989). Transitions that affect relationships thus affect both social capital and social support.

2.1. Social capital

Stress following a transition may be heightened due to one's separation from established social networks and their related *social capital*, "A resource that actors derive from specific social structures and then use to pursue their interests…it is created [and lost] by changes in the relationships among actors" (Baker, 1990, p. 619). Social capital has been linked to an array of intangible social goods from a sense of belonging and fellowship to more tangible collective goods such as increased civic participation (Lesser, 2002). From these social networks emerges a sense of collective identity through which groups can be formed, or through which different groups can be bound together. When transitions involve a change to an individual's context – a migration, move or work reassignment – the structure of relationships and networks is likely also be altered (Rice & Hagen, 2010), thus affecting (increasing, decreasing, transforming) the availability and forms of social capital. For example, students whose families move more often experience poorer academic performance, partially due to declines in their social relationships and associated resources (Pribesh & Downey, 1999).

2.2. Social support

Pearlin (1989) defines *social support* as what people use when attempting to respond to life problems. Social support is the transfer of advice, information and resources to an individual to help cope with a stressor. Supportive communication helps manage uncertainty and increase perceptions of control regarding one's life (Rains & Young, 2009). Thus social support can often mediate the relationship between stressors such as transition and deleterious outcomes.

Traditionally, social support comprises four categories (Cutrona, 1990; but see Cohen and Underwood (2000, Part II, chaps. 2–5) for conceptualization and measurement issues). *Informational support* refers to the transfer of relevant information to help cope with a problem. *Instrumental support* includes actions and materials made available through an individual's system of support. *Socio-emotional support* involves esteem support (support from companions letting a person know that s/he is accepted and esteemed), and social companionship (support gleaned from togetherness, which may distract an individual from problems and help create a positive mood). *Embedded support* is the intangible benefits from participation in a wider social network, associated with increased

feelings of wellbeing and identity affirmation. Other kinds of support have been described, but we only note here *validation*, or reinforcing comparison of self-perception and feelings by and to others, such as comments indicating a similar experience (Walther, 2002). The three principal qualifications for positive social support are that the support be empathetic (Thoits, 1986), fitting to the stressor or need (Cohen, 1988), and not perceived as a burden to the support provider (Bolger, Zuckerman, & Kessler, 2000).

Researchers have pointed to two distinctions necessary for comparing and judging the effectiveness of social support in response to a stressor. First, Cohen and Wills (1985) suggest that social support can act through two distinct channels, *main effects* and *buffering effects*. The main effects model suggests that no interaction between stressor and support system needs to exist for an individual to derive benefit from social support. Conversely, the buffering hypothesis suggests that social support may serve to insulate against the deleterious effects of a stressor. The second distinction is between *perceived* and *received support* (Haber, Cohen, Lucas, & Baltes, 2007). Perceived support refers to the perception that support is available if necessary, while received support refers to the activation of a support network in times of stress. Somewhat paradoxically, while *perceived support* has been shown to have a positive impact on wellbeing, both in the presence and absence of a stressor, more conditions apply to *received support* in order for it to positively impact stress and wellbeing.

3. Computer-mediated communication (CMC) and computer-mediated social support (CMSS)

This section summarizes the evolution of perspectives on how computer-mediated social support may alleviate stress following a transition, and situations where CMSS might help resolve uncertainty, reduce role overload, and provide social support.

3.1. An evolution in the roles of CMC for communication, emotion, and support

Early research and popular press considered CMC as the superficial complement to more meaningful face-to-face (FTF) exchanges (Kiesler, Siegel, & McGuire, 1984), though not all did (see Hiltz & Turoff, 1978; Rice & Love, 1987). CMC was not seen by experts as a viable venue for the provision of social support. Noteworthy among relevant disadvantages of CMC were limited emotional and social cues, the inability to communicate material support, and the absence of physical presence (Colvin, Chenoweth, Bold, & Harding, 2004). Support networks formed and maintained over the Internet were thought to be inferior, weaker, more ephemeral, less sustainable, and more easily exitable than networks formed and maintained with FTF contact (Jones, 1999; Rice, 1987), with accompanying lower social capital.

Not only was the medium of communication portrayed unfavorably, but individuals who relied on the Internet for the provision or receipt of social support were also portrayed largely unfavorably – as socially reclusive and anxious, with difficulties in FTF communication (perhaps exactly some of those most in need of social support). Studies suggested that Internet use was motivated by unwillingness (or inability) to communicate, and that online support seekers had an increased risk for depression, anxiety and isolation from the theoretically privileged FTF networks of support (Kraut et al., 1998). Even more recent studies of Internet use hold fast to these negative depictions of high frequency Internet users, by depicting them as narcissistic, self-promoting addicts, trading their school grades and friendships for online diversions (Turkle, 2011).

Movement away from this assessment of the Internet and its users was the result of at least two factors. First, studies like this may never have been completely valid to begin with (e.g. Kraut et al., 1998), and the studies may have somewhat reflected researchers' beliefs in a more dystopian view of the Internet. For example, Shaw and Gant (2002) questioned those early studies, finding that over time Internet use (chat sessions) was associated with lowered loneliness and depressions, and increased social support (belonging, tangible, and appraisal) and self-esteem; Katz and Rice (2002) found positive (though slight) associations between Internet use and social interaction and community involvement.

The second, and perhaps more important, factor comes from the increasingly widespread availability and adoption of dramatically improved communication technologies, providing not only wider experience and comfort with such mediated interaction, but also new ways and modes of greater expressivity (e.g., interactivity, images and video, Web 2.0 social connectiveness, etc.) (Zickuhr & Smith, 2012). Furthermore, the digital divide in Internet use among some sociodemogrpahics has been steadily closing (Katz & Rice, 2002; Zickuhr & Smith, 2012). With respect to availability of more modes and features, online supportive communication can include blogs and micro-blogs, chat, email lists (list serves), forums or message boards, and social media friends and groups. Participation can be through desktop devices, as well as wireless media such as mobile phones and tablets. Asynchronous programs like email, discussion boards and social networking sites allow users to exchange advice, resources and information across temporal transitions. Programs like Skype, Videochat and Videoconferencing allow for the communication of extra-textual and emotional cues, both visual and auditory.

The Internet can also facilitate both the creation and maintenance of relationships, online and offline (Parks & Roberts, 1998). By bridging large geographic distances, relationships formed online are often based on factors more substantial than mere geographic proximity (Rainie & Wellman, 2012). Furthermore, by breaking down barriers to communication that exist in traditional FTF communication, the Internet may serve as a social lubricant – allowing individuals to access and form relationships with diverse members of new groups (e.g., bridging vs. bonding social capital; Wellman, Hasse, Witte, & Hampton, 2001). Raake and Bonds-Raake (2007) found that online (especially social media) is a common (virtual) place for university students to meet friends. Mikal and Grace (2011) find similar results in a study of support seeking in response to acculturative stress by students studying abroad. Adolescents and young adults use new media to maintain and increase their social connectivity (Rice & Hagen, 2010).

Relationships formed in virtual space are also carrying over into real space and other media (Kim, Kim, Park, & Rice, 2007; Parks & Roberts, 1998). An active online social life is correlated with a more active social, community and political life offline (Haythornthwaite, 2005; Katz & Rice, 2002; Rainie & Wellman, 2012). As a result, it may not be valid to conceive of people as maintaining two different personas, and two different social support networks – one on and one offline (Gergen, 1992; Rainie & Wellman, 2012) – but, rather, as maintaining a single network or overlapping networks of support.

3.2. Transition, social support, and CMC

Before widespread availability of communication technology, socially supportive FTF interactions used to cope with stress were likely to be unavailable following a geographic or role transition until a person was sufficiently grounded within the new community to have formed new friendships. As such, a person would have to endure the transition to a new environment alongside a disruption to social capital and to FTF and embedded support. Less physical changes may be no less disruptive to social capital and social

support. Marriage, having a first child, or change to professional responsibility may involve no change to physical context, but, as noted earlier, encompass changes to roles and expectations that adversely affect relationships, wellbeing and stress levels.

Thus, the Internet provides (at least) two advantages over FTF support during transition. First, in situations where transition creates physical distance between an individual and his/her networks of support – such as in the case of a new school, or a new country – the Internet can enable a person to *keep in touch with old, established social support networks* (Mikal, 2012; Mikal & Grace, 2011; Rice & Hagen, 2010). Chinese migrants to Singapore, for example, use CMSS to supplement their traditional offline social support, especially early in their transition (Chen & Choi, 2011). Older Russian Jewish immigrants to Israel depend on CMSS for a variety of reasons, including maintaining and extending social networks (Khvorostianov, Elias, & Nimrod, 2012).

A second way that the Internet's lack of reliance on geographic proximity can help in times of transition is to bring individuals together with *new, more appropriate or more matching networks of support*, such as others facing the same or similar transitions and stressors. A new parent, or someone who has been diagnosed with cancer, may find social support from previously established – and previously proven – networks to be clumsy, ill-informed and ineffectual, rendering the problem worse, not better. The Internet also provides advantages over FTF support by serving as a *social lubricant* – allowing for the rapid establishment of new networks of support and breaking down other barriers to communication (another example of the fluidity of offline and online borders). Mikal (2012) found that not only did students studying abroad use the Internet to access emotional support from the country of origin, but students were also likely to use the Internet to create inlets into the target culture. For instance, students frequently reported using the Internet to locate cultural events, or other gatherings. Through these gatherings, students were able to create physical proximity, or opportunities for interaction, within a social network. Students reported that exchanging email addresses or befriending on Facebook were less forward ways of creating opportunities for additional interactions in the new culture and environment. Once a relationship had been developed online, it became easier to use tools such as group invitation on Facebook to create more FTF interactions.

Pfeil (2009) identifies some other positive characteristics of CMSS: reading and writing at one's own pace, greater confidentiality; though ties are often weaker, they are more numerous, diverse and thus provide access to more experts and more new information; reduced risk in disclosure; reduced dependency on and inequality to the support giver; and ease of disengagement. Another important difference from offline support is ongoing access to archived postings (including threaded conversations on discussion boards) and thus access to many more people, comments, and contexts, which contributes to feeling less isolated, different, or unusual, and allows more anonymity in browsing topics. Other advantages include engaging in therapeutic written disclosure in general, and the ability to focus those comments around a common theme, which relieves participants of other social expectations (Wright & Bell, 2003). Walther's (2002) analysis of a newsgroup identified four clusters of online support group features: social distance (strength of weak ties, autonomy, independence, stigma management, access to expert treatment), anonymity (including avoiding embarrassment), interaction management (hyperpersonal aspects, including time for message creation and editing, non-required future interaction), and access (time, location).

Thus the Internet can be a particularly effective medium for the provision of *informational support* (Shah, Kwak, & Holbert, 2001). Mikal (2012) found that students studying abroad were likely to use the Internet to gather information on their new surroundings, from culture, to language, to physical proximity to a grocery store

Table 4
Capabilities and benefits of computer-mediated social support.

- *Ability to "co-cope" with others* – synchronously communication via avatars in Second Life allows participants to feel they are meeting with a community of real people. Ex. Alcoholics Anonymous meetings conducted in Second Life virtual environments
- *Ability to give advice or to mentor others* – adolescents with chronic kidney disease were able to provide peer support and advice to reduce stress and social isolation
- *Access (Location)* – sufferers of health conditions (such as irritable bowel syndrome) can find information despite limited mobility
- *Access (Time)* – the ability to post or read comments about health issues at any time, including material posted in the past
- *Anonymity/Pseudo-identity* – using an anonymous or pseudo-identity for blog posting fosters greater disclosure about personal health issues
- *Support from multiple perspectives* – online support communities provide access to diverse information, experiences, and experts
- *Confidentiality* – online support communities in some ways offer greater confidentiality than face-to-face support groups
- *Contacts in personal networks do not understand* and, *Not in close proximity to others in same situation* – young siblings of children with chronic health needs could turn to an online support group to exchange social companionship and emotional and informational support with others having similar situations
- *Desire to acquire a sense of community* – childless stepmothers especially value belonging to online support groups to better discuss and reappraise their role strain
- *Do not want to burden contacts in personal network with problem* – siblings of children with chronic health problems may not wish to add to the existing stress and concerns in the family, so can turn to online support group members
- *From "marked" (i.e., stigmatized) to "unmarked" (i.e., not stigmatized)* – children with chronic liver disease were able to communicate with other children living with the same condition. Being in a group consisting of only children with chronic liver disease removed the stigma associated with being ill, and allowed the children to express support and interest in other issues
- *Sensitive or stigmatized issue* – by allowing for increased anonymity, the Internet allows individuals to seek support for stigmatized conditions for which FTF support may be too difficult or embarrassing
- *Lack of or decreased mobility* – while this certainly applies to those with health conditions, it is also useful for international students studying in the US to be able to keep in touch online with their support groups back home
- *Lack of support in physical environment* (e.g., *neighborhood*) – single mothers especially are limited in mobility and network access, so online networks provide other means of support
- *Maintain existing relationships* – individuals moving to a retirement community are able to use email to keep in touch with their children, and with now-distant friends
- *Manage reactions/emotions* – the ability of health bloggers to post and reply asynchronously allows people to organize and think about their emotional reactions before sharing them to provide or receive support
- *Need for information* – accurate and timely information is crucial during crises and natural disasters, and more accessible via online media than broadcast or face-to-face communication
- *Receive inspiration* – women experiencing mid-life challenges can find inspiration and self-efficacy through the examples of others through email and online chat
- *Solidify acquaintances* – expressing and receiving empathy and experiences from online support community members over time increases a sense of companionship, possibly fostering the development of weak ties into strong ties

Kinds of support:

- *Embedded support* – communicating with others who have similar chronic diseases increases one's community, and can foster identity affirmation
- *Informational and socio-emotional support* – sharing information about one's experience, or advice is one of the most frequent uses of online support groups
- *Instrumental support* – weak ties identified on online international student support groups may be activated to provide instrumental support, such as housing, restaurant suggestions, and translation services
- *Validation* – international students, as well as single young African–American mothers, can increase their self-efficacy, reduce acculturative stress, and cope better with discrimination through validation from others in their situation

and directions. Individuals coping with the diagnosis, experience or side effects of an illness can turn to the Internet for the gathering or sharing of relevant health information (Murero & Rice, 2006; Rice, 2006; Rice & Katz, 2001), especially where an individual may be coping with a stigmatized or rare condition, making it difficult to obtain local support. Given that a person's online environment can remain relatively constant, even in an environment of physical transition (such as international study, or immigration), the person can retain a sense of constancy, by maintaining a sense of *embedded support*. The Internet provides a language, navigation system, norms for interaction and a broader social network (Mikal & Grace, 2011; Walther, 2002). The sense of identity affirmation and validation that accompanies this continuity and constancy improves feelings of wellbeing. Children and adolescents in one study who experienced stressful life events used the Internet for both mood management and social compensation (e.g., maintaining relationships, gaining recognition (Leung, 2007), which served to buffer them from effects of those events.

Some disadvantages of CMSS, however, include being more difficult to develop trust, greater disinhibition and hostile messages, and deceptions such as faking the condition, difficulty in establishing long-term supportive relationships, polarization against non-group members, unwarranted perceptions of group credibility, dependency, decreased in-person interactions, and access/exposure to negative comments and experiences (Barak, Boniel-Nissim, & Suler, 2008; Pfeil, 2009; Wright & Bell, 2003).

3.3. Using CMSS to alleviate transitional stress

Based on the reviewed articles, Table 4 presents 20 main characteristics or benefits of online support appearing in the four

transition domains. The most frequent support characteristics were desire to acquire a sense of community, need for information, reduce geographic barriers, ability to "co-cope" with others, and sensitive or stigmatized issue. Over half of the characteristics appeared in all four transition categories. The only infrequent specific types of the five general forms of support were instrumental and validation, which also did not appear in all four domains.

Table 5 shows the occurrence of each of these characteristics or benefits across the four domains, by article. The Individual transition articles emphasized online support for those with chronic illnesses (and their young siblings), general social support for traumatic injury, and blogging about experience living with specific health conditions. Familial transition issues included role strain of stepmothers without their own children, women in mid-life transitions, and single mothers seeking support and knowledge about their daily challenges and parenting through CMC. Community transitions focused on mediated communication compensating for negative effects of relocation to retirement communities, online ethnic social groups, and the influence of Internet use on college freshmen's depression. Societal articles covered social support groups for alcoholics and cancer caregivers in Second Life, acculturative stress, and the activation of a wide range of social support and social capital via the Internet during and after Hurricane Katrina.

When transitions result in drastic role or identity shifts, relationships may begin to change and individuals may face an increased risk for isolation as they try to adapt. In situations like this, emotion-focused coping such as esteem support or social companionship, from existing and new networks, is likely to be most helpful. Almost all of the articles across all four categories of transition found evidence of online socio-emotional support.

Table 5
Characteristics and benefits of CMSS, across domains and articles.

Domain	Individual/Health						Family/Development				
Characteristics of support	Coulson (2005)	Green-Hamann, Eichhorn, and Sherblom (2011)	Nicholas et al. (2009)	Rains and Keating (2011)	Tichon and Shapiro (2003)	Wright and Bell (2003)	Craig and Johnson (2010)	Dunham et al. (1998)	Hudson, Campbell-Grossman, Fleck, Eleck, and Shipman (2003)	Hudson, Campbell-Grossman, Keating-Lefler, and Cline (2008)	Pfeil (2009)
Ability to "co-cope" with others		X	X	X			X		X	X	
Ability to give advice to or mentor others			X			X	X			X	X
Access (any location)	X	X						X	X	X	X
Access (any time)	X					X			X	X	X
Anonymity				X		X	X		X	X	X
Can receive support from many perspectives						X			X		X
Confidentiality						X				X	X
Contacts in personal network do not understand			X	X	X	X				X	X
Desire to acquire a sense of community		X	X	X	X	X	X	X	X	X	
Do not want to burden contacts in personal network with problem			X		X						
From "marked" (stigmatized) to "unmarked" (not stigmatized)							X		X	X	
Lack of or decreased mobility	X		X	X							
Lack of support in physical environment (e.g., neighborhood)				X			X	X	X		X
Maintain existing relationships		X			X			X			
Manage reactions/emotions			X	X	X						
Need for information		X	X	X		X	X		X	X	X
Not in close proximity to others in same situation	X	X	X	X	X	X	X		X	X	X
Receive inspiration											
Sensitive or stigmatized issue			X	X	X	X			X	X	X
Solidify acquaintances								X			X
Embedded support		X	X	X		X	X	X	X	X	
Informational support		X	X	X	X	X	X		X	X	X
Instrumental support									X		
Socio-emotional support	X	X	X	X	X	X	X	X	X	X	X
Validation						X					

Table 5 (*continued*)

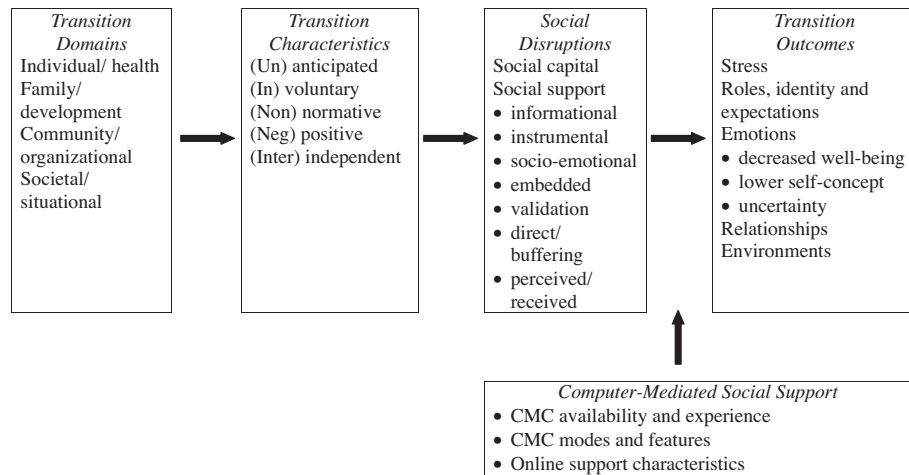|	Community/Organizational						Societal/Situational	
	Dare and Green (2011)	Drentea and Moren-Cross (2005)	Ellison, Steinfeld, and Lampe (2007)	Morgan and Cotten (2003)	Waldron, Gitelson, and Kelley (2005)	Ye (2006)	Dutta-Bergman (2004)	Procopio (2007)
Ability to "co-cope" with others	X	X	X	X		X	X	X
Ability to give advice to or mentor others	X		X	X		X	X	X
Access (any location)	X	X						
Access (any time)	X	X		X		X		X
Anonymity								X
Can receive support from many perspectives	X							
Confidentiality								
Contacts in personal network do not understand						X	X	X
Desire to acquire a sense of community	X	X	X	X	X	X	X	X
Do not want to burden contacts in personal network with problem							X	
From "marked" (i.e., stigmatized) to "unmarked" (i.e., not stigmatized)		X						X
Lack of or decreased mobility	X			X		X		
Lack of support in physical environment (e.g., neighborhood)		X						X
Maintain existing relationships					X			
Manage reactions/emotions								
Need for information	X	X	X	X	X	X	X	X
Not in close proximity to others in same situation	X	X				X	X	
Receive inspiration	X		X	X		X		
Sensitive or stigmatized issue	X		X	X		X	X	X
Solidify acquaintances								
Embedded support			X	X		X	X	X
Informational support	X	X	X	X		X	X	X
Instrumental support		X				X		
Socio-emotional support	X	X		X		X	X	X
Validation	X					X		

Fig. 1. Relations among transition, social disruptions, outcomes, and computer-mediated social support.

In such instances of role or identity shift, individuals are likely to respond by attempting to *rapidly reestablish* more fitting networks of support. Individuals facing identity shifts characteristic of a chronic illness may only be able to find support for other, non-health-related issues by *escaping their* "*marked*" status through participating in homogeneous online illness-support groups.

Individuals facing grim health diagnoses, or recent amputees, may struggle to adapt to new *limitations in physical mobility* with associated social isolation. Meanwhile, new parents may also find their mobility limited by their new roles and obligations. In both of these cases, an individual's ability to access their networks of support through physical, FTF channels are likely to be limited. Students studying abroad, new parents, or immigrants in a new country, will also face limited physical access to members of previously established and effective networks of support. Such people may find that the Internet provides *increased access* to established and effective networks of social support, across long distances and across time differences. Users may also benefit from a *sense of community* online, that they are unable to enjoy in FTF communication due to physical distance or limited mobility.

During times of transition, as roles change and an individual is less able to anticipate demands, individuals are likely to need access to information to address the *uncertainty* endemic to transition. Individuals may face new fears and uncertainties related to health outcomes following a diagnosis. Or in more normative transitions such as changes in occupation, or transitions in school environments, individuals may face new demands, new expectations, and new norms. Those facing new health demands or new job responsibilities may have questions and lack knowledgeable support systems to provide accurate and timely responses. Students progressing to new educational environments may feel stigmatized by their challenges and be reluctant to seek out support. In these cases, the information provided online can be invaluable. In fact, *information seeking* – or the act of looking for problem-focused, specific information about a topic or issue – was the second most common use of CMSS. Most of the articles across all four categories of transition reported use of the Internet to seek information. According to one of the articles, children who had undergone kidney dialysis not only reported benefitting from the information available online, but reported benefits from providing support to those who needed it by recounting of their own experiences, as well (Nicholas et al., 2009).

An added benefit of CMSS is the perception that support is available if needed, important because the *perception of available support* can help to reduce stress, either directly or via buffering.

Finally, while transition may result in changes to an individual's *financial status*, or the need for material support, very little evidence has been found for the transmittal of *instrumental support* online. Only three articles in two categories showed any evidence of the exchange of material support. However, support systems may be mobilized in order to request and distribute materials.

Thus, as Fig. 1 shows, the increasingly diverse forms of CMSS via the Internet, if matched well to types of transitions and related stress, can foster the kinds of social capital and social support necessary to reduce transitional stress.

4. Conclusion

Early research on CMC depicted virtual and physical realities as separate and distinct, assigning relative values to the support received through each. However, as technology improves, becomes more interactive, group- and community-oriented, offers more multi-media services, and becomes increasingly available, integrated into people's lives, and normative, the profile of both the medium and the user have started to change. This leads to both a more complimentary and complementary depiction of both CMSS, and those who avail themselves of it. No longer do we conceive of online and offline as two separate and distinct spaces. Rather, there is increased awareness in the literature of the fluidity between on- and offline peer networks, and the mutual influence they can have on each other. Social support can be conceived of as a continuous, multi-dimensional resource accessed through multiple (and interrelated) channels. As a result, when a transition occurs in the physical or social context – be it in the form of a relocation or an abrupt change to the support required from that context, generating stress, and decreased well-being – (re) establishment, extensions, or new forms of one's support network are possible. Computer-mediated social support allows people to access established strong ties, maintain or establish weaker ties comprising a sense of community, and rapidly establish new networks in a low risk fashion, helping to manage transitions and their associated stress.

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