

# **UNDERSTANDING USER INTERACTION PATTERNS IN HEALTH SOCIAL MEDIA**

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May 30, 2013 - Dissertation Defense  
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# Acknowledgements

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- Thesis Advisory Committee:
  - Dr. Christopher C. Yang (chair)
  - Dr. Jennifer Unger
  - Dr. Jung-Ran Park
  - Dr. Margo Orlin
  - Dr. Weimao Ke



## Pensieve

*“One simply siphons the excess thoughts from one's mind, pours them into the basin, and examines them at one's leisure. It becomes easier to spot patterns and links, you understand, when they are in this form.”*

— Albus Dumbledore to Harry Potter (4<sup>th</sup> book of series, Chapter 30)



# Imagine you search for this...

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Am I an Alcoholic at 21?



**Web**

Images

Maps

Shopping

More ▾

Search tools

About 19,900,000 results (0.42 seconds)

Ads related to **Am I an Alcoholic at 21?** ⓘ

**[Alcoholic - Alcohol Addiction Rehab](#)**

[www.drugrehabcenter.com/](http://www.drugrehabcenter.com/)

Exclusive Residential Center In Florida.

**[Am I an Alcoholic? - AlcoholScreening.org](#)**

[www.alcoholscreening.org/](http://www.alcoholscreening.org/)

Take this free test to find out if you drink too much.

**[Am I an Alcoholic at 21? - Alcoholism - MedHelp](#)**

[www.medhelp.org/posts/Alcoholism/Am-I-an-Alcoholic-at-21/.../176933...](http://www.medhelp.org/posts/Alcoholism/Am-I-an-Alcoholic-at-21/.../176933...) ▾

Jul 11, 2012 - 6 posts - 5 authors

Hi everyone! I **am 21** years old and yesterday I experienced my first **alcohol** withdrawal (irritability, tremors, nightmares, hallucinations, and ...

# And you click on the first result...

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- Hmm.. Megan has the same question as me.
- 5 replies...
  - Personal stories given
  - Book recommendations

The screenshot shows a web browser window displaying a forum post on the MedHelp website. The browser's address bar shows the URL: [www.medhelp.org/posts/Alcoholism/Am-I-an-Alcoholic-at-21/show/1769337](http://www.medhelp.org/posts/Alcoholism/Am-I-an-Alcoholic-at-21/show/1769337). The page header includes a banner for 'Re-learn life without cigarettes' with a 'Free Quit Plan' button and the 'ex' logo. The MedHelp navigation bar includes links for Forums, Tools, Information, Experts, My MedHelp, and a search bar. The forum post is titled 'Alcoholism Community: Am I an Alcoholic at 21?' and is by user 'Megan30373' from July 11, 2012, with 5 comments. The post content describes a 21-year-old's experience with alcohol withdrawal symptoms and asks for advice. The post has tags for 'alcoholic', 'Insomnia', and 'withdrawal'. To the left of the post is a Domino's pizza advertisement. To the right are several widgets: an Adobe Creative Cloud advertisement, a 'Search this Community' bar, a 'Weight Tracker' widget, and a 'Popular Resources' section with links to articles about skin cancer, marijuana, smoking, stress, and depression. At the bottom, a comment from 'dominosarah' dated July 12, 2012, is visible.

# Possible Reaction to the UI

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*“I wonder if that advice would apply to me...”*

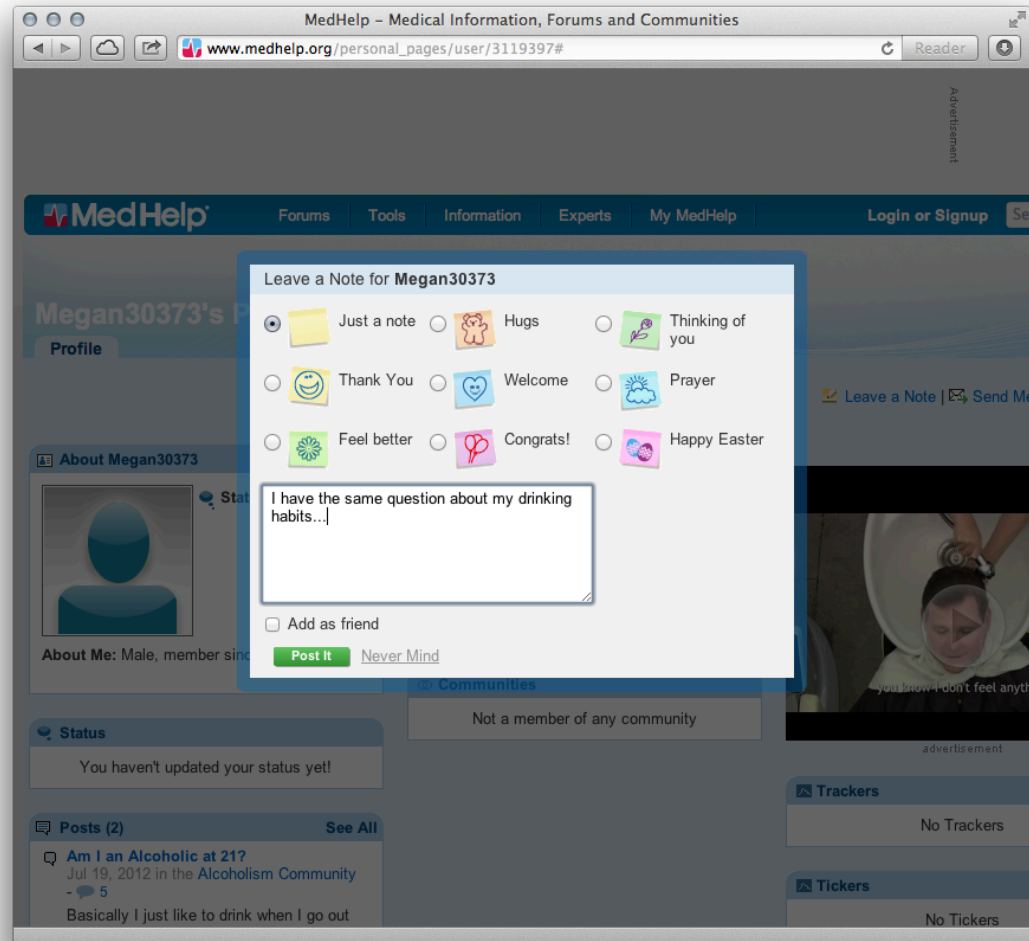
*“Gosh, I don’t feel comfortable responding to the whole group...”*

- There are different facets of communication (Farnham and Churchill, 2011)

# A possibility...

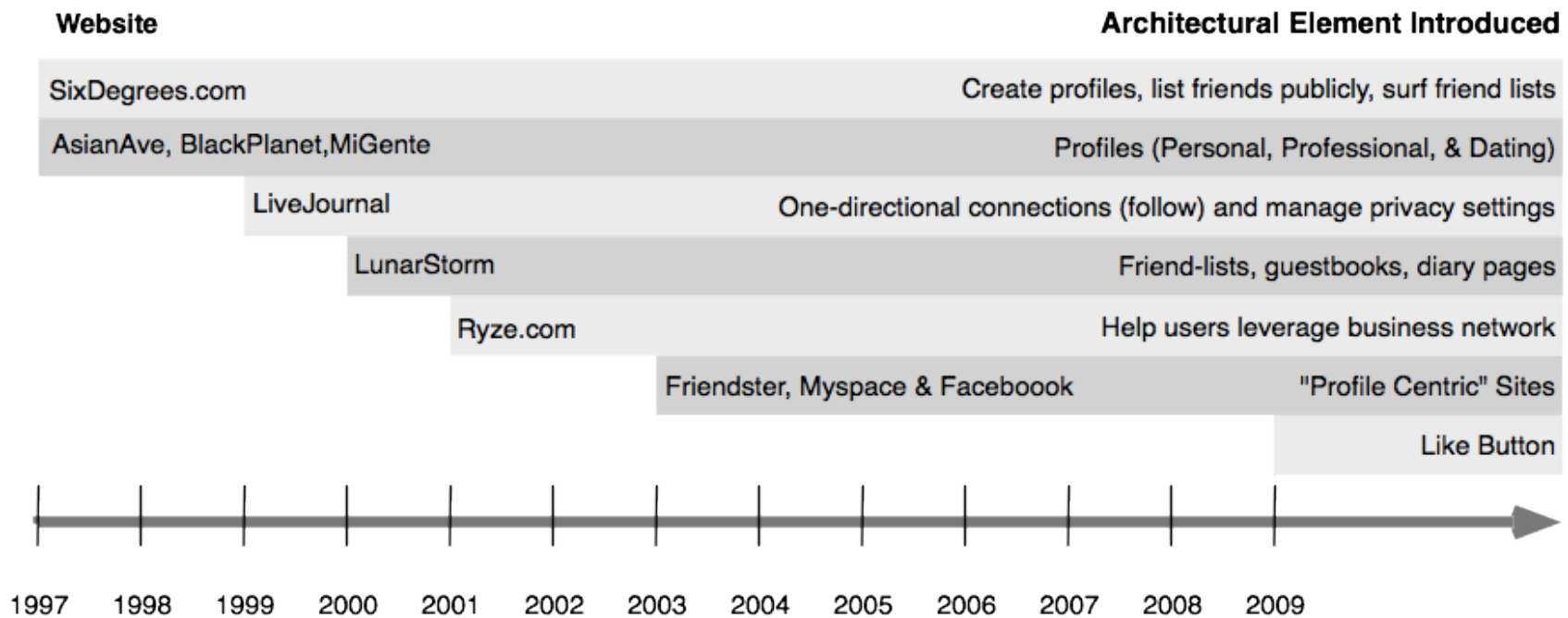
7

A possibility to stay  
in contact with less  
exposure.



# Social Networking Features Available

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# Online Health Social Networking

*“e-patients are looking for a sense of community”*

-Wright & Bell, 2003

*“e-patients are looking for ‘just-in-time someone-like-me’  
health information”*

- Boase et al, 2006; Fox & Jones, 2009

**41%**

read patient blog,  
health newsgroup,  
or health website

**39%**

used social  
networking site

**12%**

shared updates or  
viewed updates

**\*E-patient:** internet user that is looking for health information

# Significance of Study

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- Previous research has different perspectives:
  - Issues that concern Health Professionals
  - Issues that concern E-Patients
  - Issues that concern Health Records
- Expand scholarly literature
  - Compared CMC formats **within** one online community.
  - Use mixed techniques for samples.
- Fill limitations in previous work
  - There are still gaps in understanding the technology.

# Filling Gaps Found in Related Research

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## Previous Studies



## This Study

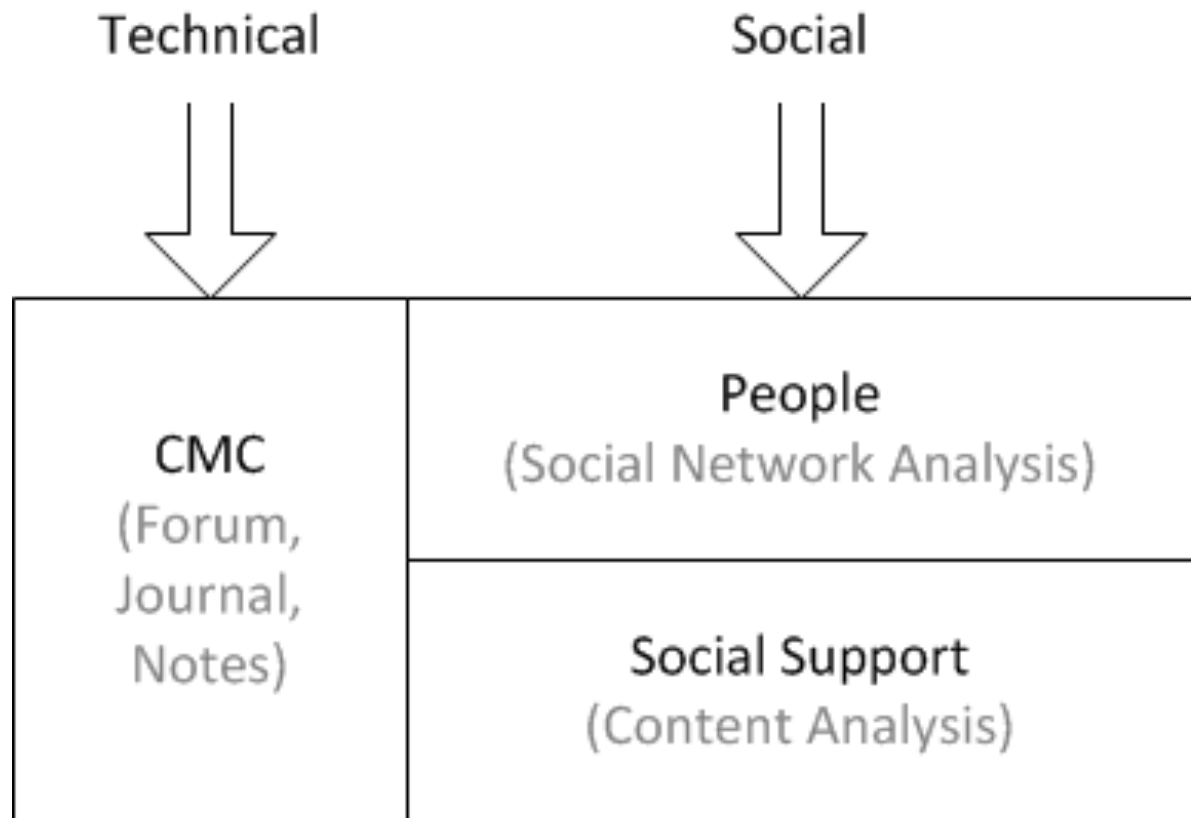


## Theoretical Framework = Technical and Social factors

Online communities are a combination of technical and social factors (Latour, 1992; Preece, 2000).

Members communicate through text-based computer mediated communication (CMC) formats.

Support communities are composed of people who are building relationships and exchanging social support.



# Research Themes

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- Observations:
  - Some users are more active, others lurk
  - Some are new to community
  - Social roles (i.e. alcoholic, friend of alcoholic)..
- CMC formats have different features
  - ✦ Who can write? read? Where is the message saved?

# Research Method Part 1

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- Reveal interaction patterns in user content
- Social media is used by health consumers to ...
  - Communicate health information
  - Share social support
  - Build friendships with each other
- Significance of studying e-patient interactions
  - Reports show that internet use for health information is growing (Kielstra, 2009; PEW Research Ctr, 2006, 2009, 2010)

# Medhelp.org

*“connects people with the leading medical experts and others who have similar experiences”*

*“helping patients find answers to their questions”*

*“helping patients actively manage their health”*

## • Founded in 1994

- Oldest online community
- Pioneer of online health communities
- 10 mil monthly visitors

The screenshot shows the MedHelp website with a blue header containing navigation links: Forums, Health Tools, Health Information, Drugs, People, Experts, Pets, and My MedHelp. A search bar is located below the header with the text "Search conditions, symptoms, and treatments" and a "Search" button. To the right of the search bar, there are links for "Login" and "Join Free Membership".

The main content area features a large banner with the text "Finding cures together." and a "Sign Up Now!" button. Below the banner, there are tabs for "Forums", "Tools", "Experts", and "Health Centers". The "Forums" tab is selected, showing a section titled "The World's Largest Health Community ...sharing their experiences" with a graphic of people holding hands around a globe. Below this, there are three columns of "Popular Communities": Physical Health (Dermatology, Gastroenterology, Heart Disease, Lyme Disease, Neurology), Women's Health (Breast Cancer, Fertility, Maternal & Child, Ovarian Cancer, Pregnancy), and Healthy Living (Addiction, Allergy, Children's Allergies, HIV Prevention, Men's Health). A "See all communities >>" button is at the bottom of the list.

On the right side of the page, there is a "Member Login" section with fields for "Nickname" and "Password", a "Remember login info" checkbox, and a "Login" button. Below the login section, there is a statistics box showing "Monthly visitors: 10 million" and "Medical posts: 4,301,267". Further down, there is a "MedHelp Partners" section with a "See all" link and a logo for "The New England Center FOR CHILDREN We Open Doors®". Below that, there is a "Partner with MedHelp" section with the text "MedHelp works with doctors, hospitals, and non-profits to find cures together." and a "Become a partner" link.

At the bottom, there is a "MedHelp Doctors & Members" section featuring a profile for "John C Hagan III, MD, FACS" with a photo and a link to "Discover Vision Centers Forum: Eye Care". Next to it is a profile for "Japdip" with a pink ribbon icon and the text "Dedicated to the support & education of those in need".



# Profile Page contains...

- **Forum:** Public Q&A
- **Journals:** Diary Style
- **Notes:** Profile Posts

Forum

Journal

Notes

**About Me:** Male, 35, ON, member since Dec 2007  
**Mood:** Off work today, brrrrrrrrrr.  
**Interests:** living life clean  
**Best Answers:** 4

**Addiction Recovery Tracker...**  
**Addicted to:** Alcohol, Cocaine  
**Clean Days:** 138

**HER2+ Breast Cancer Support**  
**Join the HER Story Community**  
 Visit NOW

**Photos (49)**  
 No photos

**Notes (2830)**  
 (1628) (427) (124) (262) (15) (54) (70) (148)  
 (1) (2) (11) (2) (33) (12) (13) (10) (18)  
 Leave a Note

**Trackers (2)**  
 Addiction Recovery Tracker (gizzy32)  
 Addiction Recove or (Myself)

**Tickers (2)**  
 gizzy32 461 Days  
 gizzy32 138 Days  
 MedHelp.org MedHelp.org

**Friends (687)**  
 See All  
 Female, OH  
 Female  
 Female, 35, TN  
 Male, 56, Near Seattle -

**Forum:**  
**Vicodin withdraw help**  
 Oct 21, 2010 09:52AM in the Addiction: Substance Abuse Community  
 I think you need to talk to your dr about this, before upping your dose of zoloft. Are you getting the Vicodin from your ...  
**Another Roll Call**  
 Oct 21, 2010 09:37AM in the Addiction: Substance Abuse Community  
 Well done guys and gals, I love reading these. We all rock:) Thank you for all the help I got last night here, I got m...  
**help**  
 Oct 21, 2010 09:27AM in the Addiction: Substance Abuse Community  
 Welcome to the forum. How much were you taking and for how long? Did you just stop using? Everyone is different when it c...

**Journal:**  
**All Journal Entries (48)...**  
 See All  
**Today**  
 Oct 12, 2010 02:01PM - 14 Comments  
 It has been almost 3 years since I quit cocaine and drugs, although I have had a few mini 1 or 2 day relapses since. I was an everyday user back then and could not go a da...  
**Prayers for my best friend please**  
 Sep 20, 2010 08:01PM - 30 Comments  
 I am writing this journal for my best friend here on medhelp, bobby139 (Deb) She has done more for me than imaginable and I care deeply for her. She had a lump removed not

**Notes:**  
**18 hrs**  
 Just a quick note to say hi! Doing better today? I just took a quick peek at the notes from yesterday. That's a lot of people who care about you. Glad you shared yesterday. Keep it up!!!  
**Oct 20**  
 You got this! I know you do, you can beat it man, you are stronger than it:) I'm proud of you:). Any thoughts as to what triggered it?  
**Oct 20**  
 You are in my thoughts and prayers.  
**Oct 20**  
 Gizzy, you fight this hard my friend. Get some Seether on the stereo and play Rise Above This LOUD. You are in control of you now, not your addiction. Dont make me go all Mary Poppins



## Related studies only focus on one CMC


Author	Data	Type
Preece (1999)	Torn Knee Ligament	Email List
Braithwaite et al (1999)	“Support Network”	Email List
Bambina (2007)	Support OnLine Cancer Forum	Email List (stored online)
Meier et al (2007)	10 cancer mailing lists	Mailing lists
Pfiel & Zaphiris (2007)	Depression/Seniors	Bulletin Board
Cunningham et al (2008)	Alcoholism	Bulletin Board
Eichhorn (2008)	Eating Disorder msg boards	Yahoo Discussion Groups
Coursaris & Liu (2009)	HIV/Aids	Bulletin Board
McCormack (2010)	Anorexia Bulletin Board	Bulletin Board
Selby et al (2010)	Smoking cessation	Web assisted tobacco intervention, bulletin board

# Objective

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- Understand prevalence and characteristics of different support types that peers exchange.
  - Categories come from literature review on social support
  - Categorize messages into support types
    - ✧ Dimensions:
      - Offered vs requested
      - Post vs comments

**MedHelp Member's Question**

 **Does Jail time count in sobriety**  
by [nikky6dk](#), Sep 02, 2009 02:06PM


I was locked up for 22 months in Florida dept of corrections. I got out in July. I immediatley started antending [AA meetings](#) upon my release. I'm celebrating two years of my sobriety Sept.25. My Ex Wife says the time in prison doesnt count. She has 26 years of sobriety. She has me confused. In Prison they make [alcohol](#) by the gallon, pot,heroine and pills are plentiful.However I chose not to drink,or use. Ther are people in prison that have 10 ,15 ,20 years of sobriety that attend AA meetings, That will never get out, Does this mean their time doesnt count. I value what she says, but i'm not sure she is correct. Help

**Member Comments (13)**


 by [ibizan](#) ✨, Sep 02, 2009 08:44PM  
To: [nikky6dk](#)

i have 25 years sober/clean....every day u don't drink or use its a sober clean day!i think ur x-wife is so very wrong!Nobody passed and appointed her an AA goddess!:) )

---


 by [dominosarah](#), Sep 04, 2009 12:31AM  
I have been sober for 7 yrs and noone is going to take that time from me. Congrats on your upcoming anniv!! sara

---

 by [boogieman](#), Sep 07, 2009 11:38AM  
To: [nikky6dk](#)

sober time is sober time. it is harder to stay sober in prison--so you should be commended! keeep the faith! take care, gm

---

 by [Fantasma](#), Sep 07, 2009 03:09PM  
To: [nikky6dk](#)

# Research Theme 1

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## Research Question

- RQ1: What social support patterns exist in messages exchanged by members of an online health community?

## Objective

- Study the patterns of social support exchanges of 3 CMC formats: Forums, Journals, Notes

## Approach

- Descriptive Content Analysis
  - Coding: social support types for each message

# Medhelp Alcoholism Community

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3 Months  
June-Sept 2009



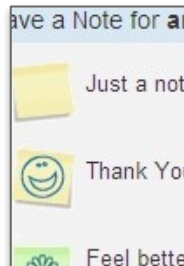
## Forums ( $n = 493$ )

- [FP] 81 posts
- [FC] 412 comments



## Journals ( $n = 423$ )

- [JP] 88 posts
- [JC] 335 comments



## Notes ( $n = 1180$ )

*Messages contain:*  
-No support  
-Information  
-Nurturant  
-Both support

# Approach

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1. Data source = MedHelp.org Alcoholism
2. Data collection = crawler
3. Unit of analysis = each message
4. Convert text files to Excel spreadsheets
5. Time Frame:
  1. 9<sup>th</sup> June 2009 – 9<sup>th</sup> September 2009

# Informational Support

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Support	Definition	Example
Advice	Offers ideas and suggests actions to deal with situation (Cutrona & Suhr, 1992).	<i>"Campral works better...ask u r doc about it!"</i>
Referral	Refers the recipient to some other source of help.	<i>"Im gonna send you a link that might help."</i>
Fact	reassesses the situation and presents facts.	<i>"Drinking too much alcohol daily can be a high risk to your health, you might fall into alcohol addiction."</i>
Personal experience	stories about person's experiences.	<i>"I have been going though something like that with an addict using in our bathroom and...."</i>
Feedback / Opinion	a view or judgment formed about something, not necessarily based on fact or knowledge.	<i>"From what have you posted, it seems that you are in the stage where you have been looking to drink everyday and it is a clear sign of alcohol addiction."</i>

# Nurturant Support

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Support	Definition	Example
Esteem	posts providing positive comments to praise support seekers abilities or to alleviate feelings of guilt.	<i>“Congratulations on your sobriety!”</i>
Network	posts providing messages to broaden support seekers social network so they don’t feel alone.	<i>“Just reach out and I will be there ok?”</i>
Emotional	posts providing understanding of situation, express sorrow, provide with hope and confidence.	<i>“You're going through a rough time....” or “Hang in there hon”</i>

# 1. Text files

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Name	Post File	Post Comment File
	#XTSTART#	#XTSTART#
JournalComments.txt	Title	Title
Journals.txt	#@XTSEP@#	#@XTSEP@#
PostComment.txt	URL	URL
Posts.txt	#@XTSEP@#	#@XTSEP@#
UserCommunity.txt	Name of Publisher(ID of Publish	#@XTSEP@#
UserFriendship.txt	#@XTSEP@#	Name of Replier(ID)
UserInformation.txt	Timestamp	#@XTSEP@#
UserInformation2.txt	#@XTSEP@#	Whom this post is repied to (and ID)
UserInterest.txt	number of reply	#@XTSEP@#
UserJournals.txt	#@XTSEP@#	Time
UserNotes.txt	name of replier(ID){repliers ar	#@XTSEP@#
	#@XTSEP@#	# content#
	Content	
	#XTEND#	#XTEND#



## 2. Excel file

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	A	B	C	D	E	F
1		title	publisher	timestamp	content	lguide
2	1	Does Jail time count in sobriety	nikky6dk(1 025924)	Sep 02, 2009 02:06PM	I was locked up for 22 months in Florida dept of corrections. I got out in July. I immediatley started antending AA meetings upon my release. I'm celebrating two years of my sobriety Sept.25. My Ex Wife says the time in prison doesnt count. She has 26 years of sobriety. She has me confused. In Prison they make alcohol by the gallon, pot,heroine and pills are plentiful.However I chose not to drink,or use. Ther are people in prison that have 10 ,15 ,20 years of sobriety that attend AA meetings, That will never get out, Does this mean their time doesnt count. I value what she says, but i'm not sure she is correct. Help	1
		Fever, shivering, hypnagogia , diarrhea, tachycardia	Hyperion9	Sep 09.	Sometimes when I drink a little too much for my size (- without being 'drunk' as in passing out or not being able to walk straight) I have serious physical problems about 7-8 hours later. I have very disturbed sleep, which is normal, I wake up about 4 hours into the night and feel dehydrated so i drink a bottle of water, then usually I can't sleep after this so I do some work on my computer. I eat something sugary to try and help recover some sugar into my blood stream. Then i go back to sleep... and the last this happened, I had been working on my computer so i put is on the floor by my bed. well in my 'dream' there were computers multiplying around me. I thought I was awake - I might have been? But I was thrashing about and I knew that I didnt have like 4 computers around me, but i couldnt remember which was the real one. Because i thought I had put it on the floor, but I looked on the floor and it wasn't there. I kept having false awakenings, and I went from falling asleep very hot to feeling cold and clammy. My heart was beating very fast and hard, and I started having arrhythmia's. I got a zapping kind of feeling in my 'brain' -well somewhere in my head . I found that I wasnt very aware of what my body was doing, i thought i might have been shaking uncontrollably but that might have been imaeined. i tried so hard to cry out because i seriously though my heart was going to go. somehow I	

# 3. Coding

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	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP
	I.guide	I.ref	I.fact	i.per	i.feed	es.comp	es.rec	es.rel	n.acc	n.pres	n.comp	em.rel	em.aff	em.conf	em.symp	em.listen	em.und	em.enc	em.prayer				Help for who?	Hæ Info	Hæ Est	Hæ Net	Hæ Em	Hæ Other	Instances		O-Info	O-Nur	O-Other	Total	R-Info	R-Nur	R-Other
2	1		2	0																		m		3	0	0	0	0	3		2	0	0	2	2	0	0
3			2	0																		m		2	0	0	0	0	2		2	0	0	2	1	0	0

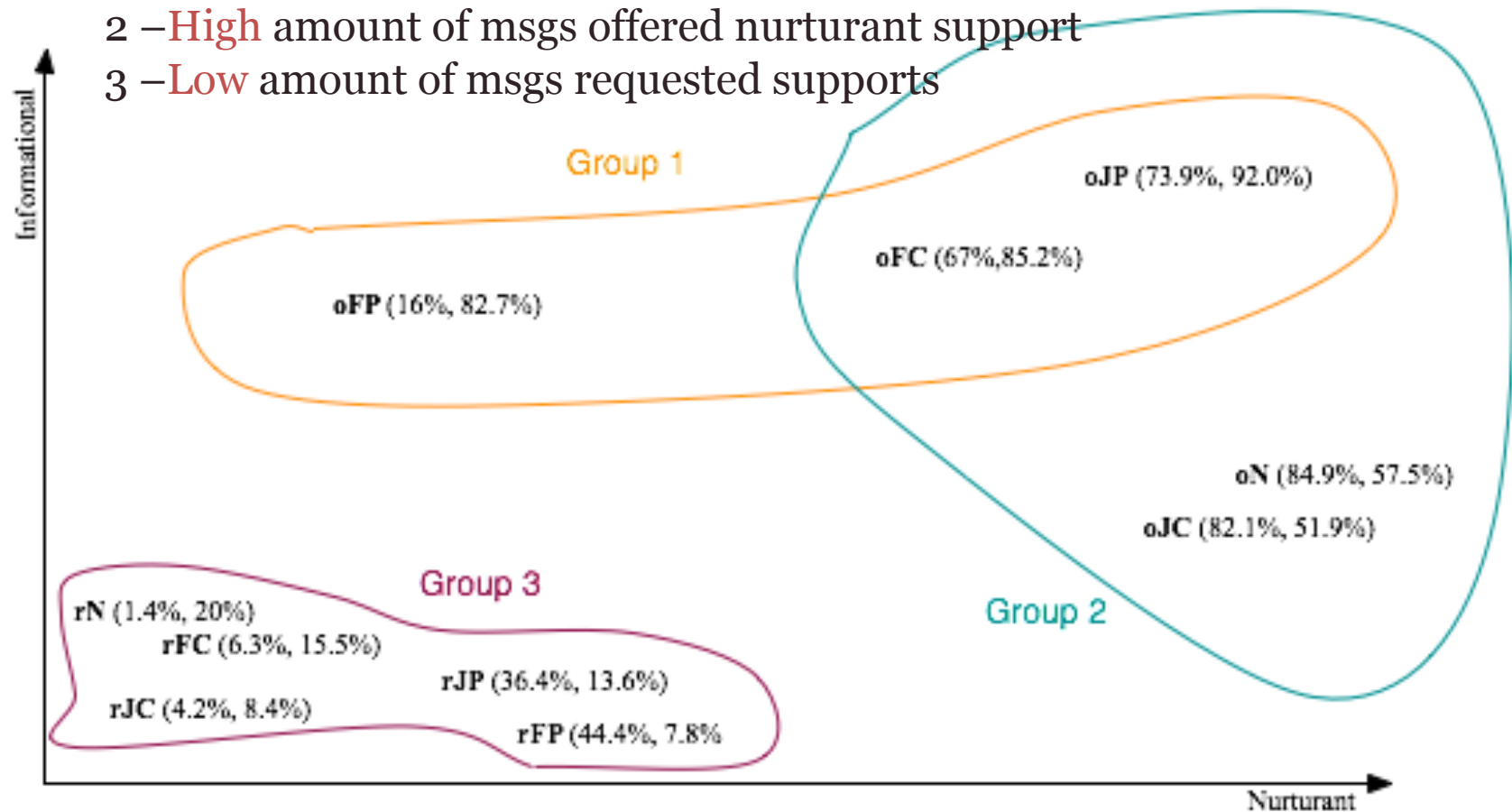
0 = Offered; 1 = Request; 2 = both

posting for self (M); friend (B); family member (F); spouse (S); sig other (SO).

# What patterns of social support exchanged emerge?

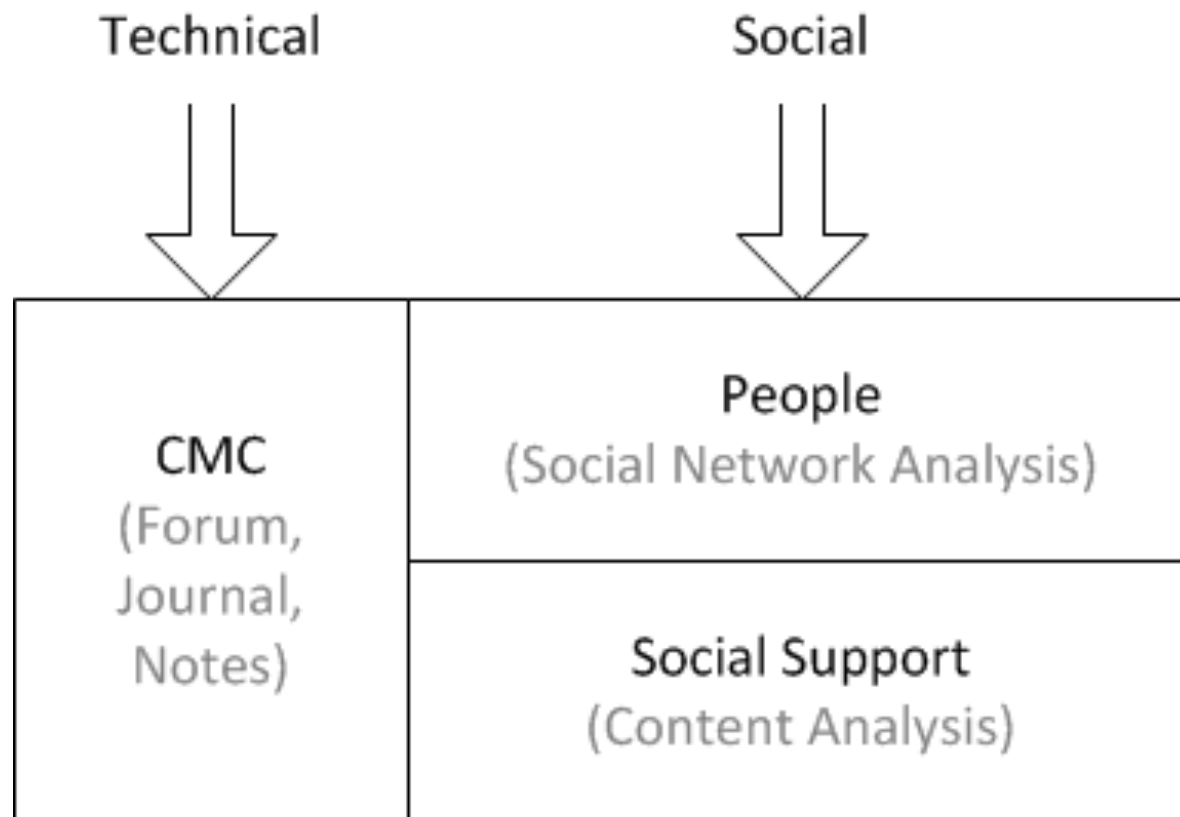
27

- 1 – **High** amount of msgs offered informational support
- 2 – **High** amount of msgs offered nurturant support
- 3 – **Low** amount of msgs requested supports



# Research Framework

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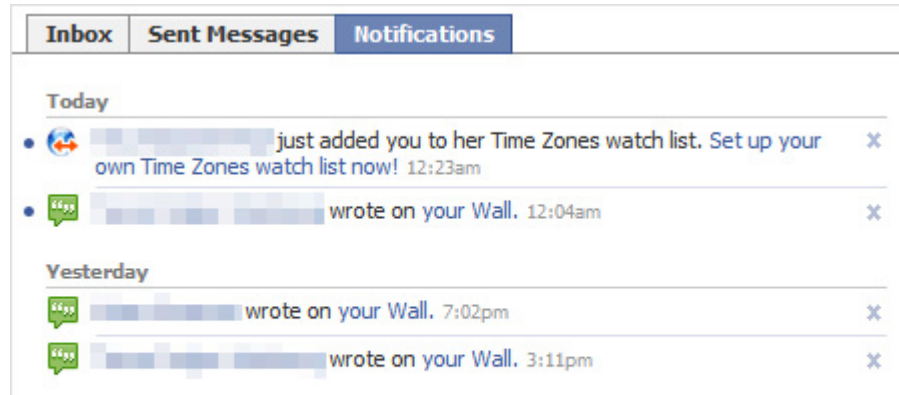
# People want to stay in touch

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“Friending enables users to form and maintain connections”

- Ahn et al, 2007



“Private and public messaging allow for interpersonal communication”

- Thellwall & Wilkinson, 2010

“SNS users expect to gratify their social-emotional needs”

- Rau et al, 2008

“Positive comments are observed between MySpace friends”

-Thelwall & Wilkinson, 2010

# Health Social Networking

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- Health Context...
  - Hundreds of support communities
    - ✦ Cancer, pregnancy, mental health, substance abuse, etc.
  - More features than old software:
    - ✦ Bulletin Boards (BB), email lists, discussion boards, blogs, etc.
    - ✦ 'Friending' and status updates, notes

# Research Theme 2

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## Research Question

- RQ2: What social network structure patterns emerge in messages exchanged by members of an online health community?

## Objective

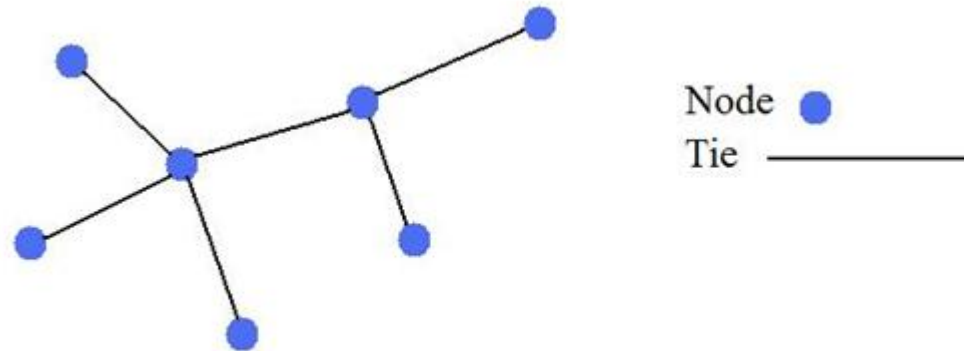
- Study the patterns of social support exchanges of 3 CMC formats: Forums, Journals, Notes

## Approach

- Social Network Analysis
  - Metrics: structural and positional

# Social Graph Representations

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	User1	User2	...	Target
User1		1		
User2	3			
...				
Sender				



# Part 2: Social Network Analysis

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- Structural Metrics
  - Centrality Measures: gives a rough indication of a person's "connectedness" the network.
    - ✦ In Degree: the number of people that talk to him/her
    - ✦ Out Degree: the number of people he/she talks to
  - Geodesic Distance = shortest distance between two specific nodes
  - Density = number of edges / number of nodes
- Positional Metric
  - id different roles of a group setting
- Positional analysis to Know range of roles and characteristics to make recommendations for designing a social support system that is suitable for users

# Centrality

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- Betweenness = the number of people who a person is indirectly connected (i.e. controls flow of information)
- Eigenvector = influence of a node
- Closeness = based on shortest paths; measures distance to spread information from a node  $x$  to all other nodes sequentially

# Some Insights

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- **Forum:**
  - User reach out to a wider group of people and hold group conversations.
  - They tend to be on receiving end.
- **Journal:**
  - Tend to be writing messages and to a smaller audience
- **Notes:**
  - Less overlapping connections, one to one conversations

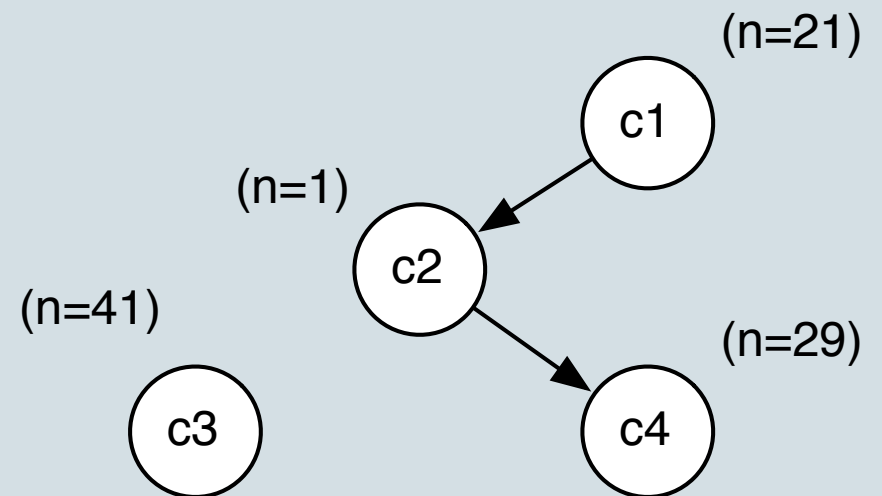
# Procedure

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## Image Matrix

	1	2	3	4
1	0	1	0	0
2	0	0	0	1
3	0	0	0	0
4	0	0	0	0

## Reduced Graph



# Social Positions

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- Isolates: nodes with neither indegree nor outdegree
- Transmitters: nodes with only outdegree
- Receivers: nodes with only indegree
- Carriers: nodes with both indegree and outdegree.

Network	Total	Isolates	Transmit	Receiver	Carriers
Forum, Informational	102	29 (c3)	21 (c1)	51 (c4)	1 (c2)
Journal, Informational	62	47 (c4)	4 (c1)	6 (c3)	5 (c2)
Notes, Informational	40	24 (c2, c4)	2 (c3)	14 (c1)	0
Forum, Nurturant	77	44 (c4)	21 (c3)	9 (c1)	3 (c2)
Journal, Nurturant	102	75 (c4)	10 (c1)	13 (c2)	4 (c3)
Notes, Nurturant	52	32 (c4)	18 (c1, c2)	3 (c3)	0

# Configurations of Ties between Social Positions

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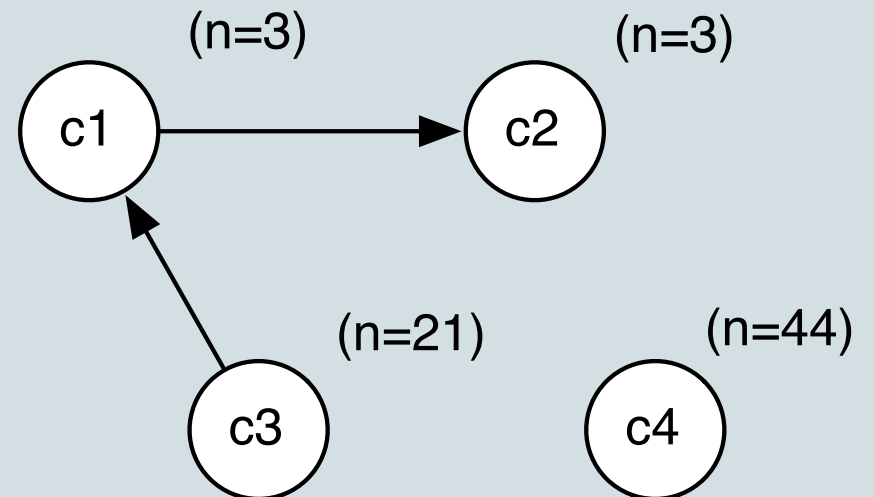
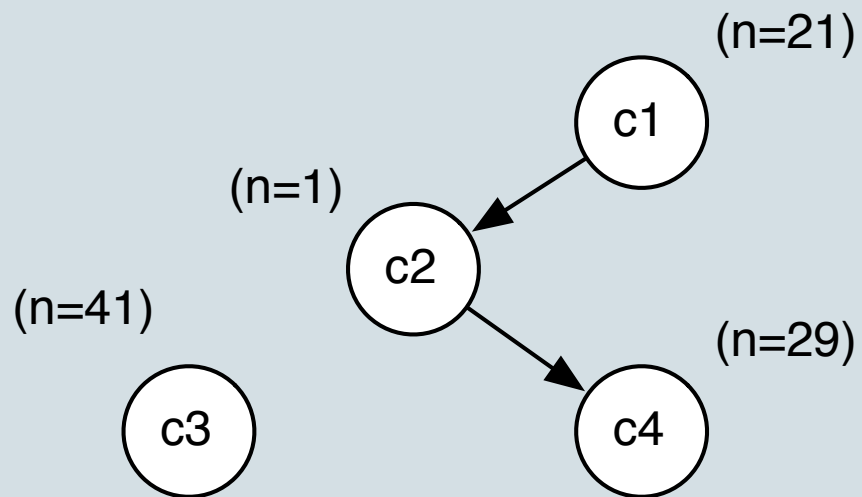
Tie	Meaning
Self loop	A single cohesive subgroup and an isolated position
One tie between positions	Transmitting end is providing support Receiving end is requesting support
Self loop for each position	Two subgroups
Two ties from node: self loop and regular tie	Distinguishes between an “active” position and a “passive position”
Two ties to node: self loop and regular tie	Resembles a core-periphery system. The position of more indegrees has been around longer than the other position.

# Forum

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Informational

Nurturant

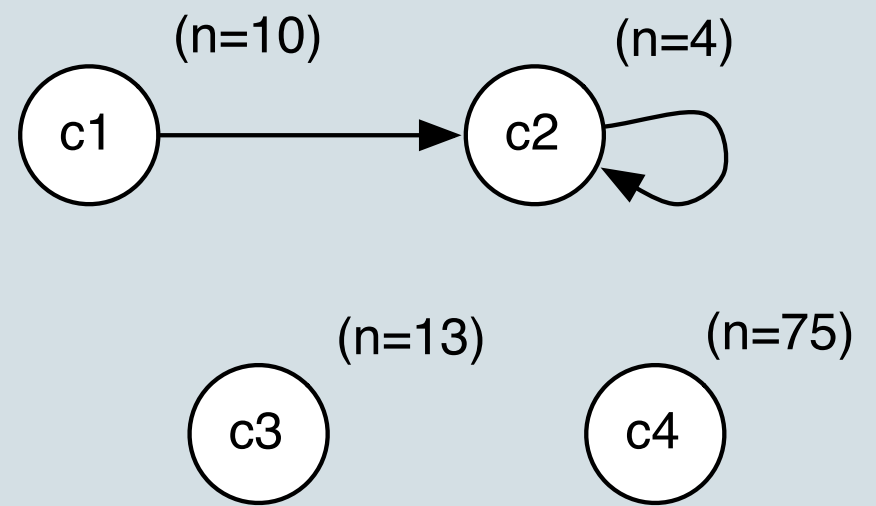
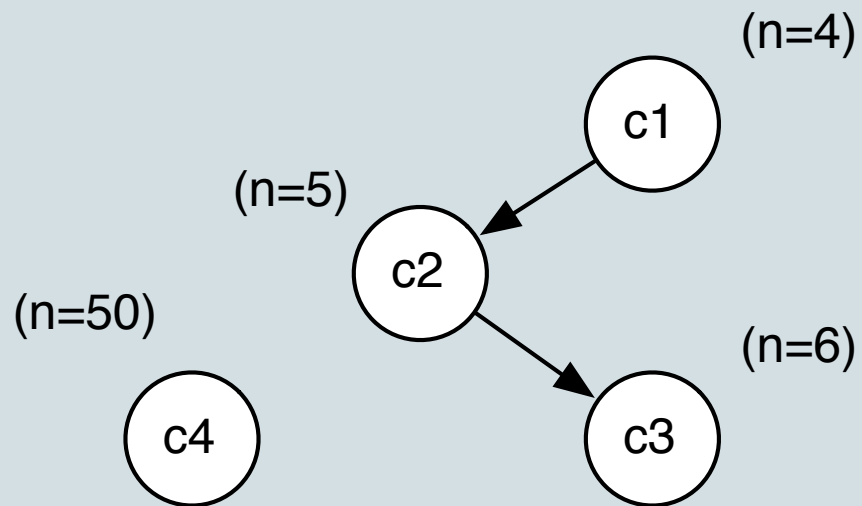


# Journal

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Informational

Nurturant

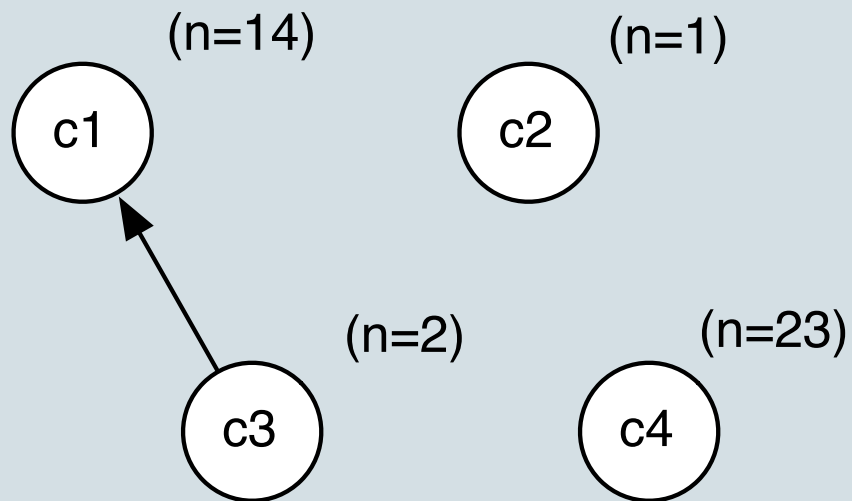




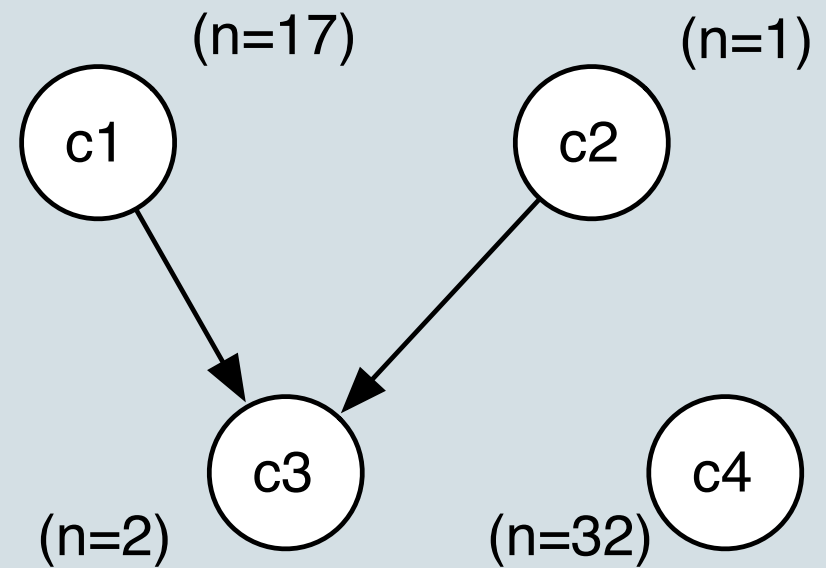
# Notes

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## Informational

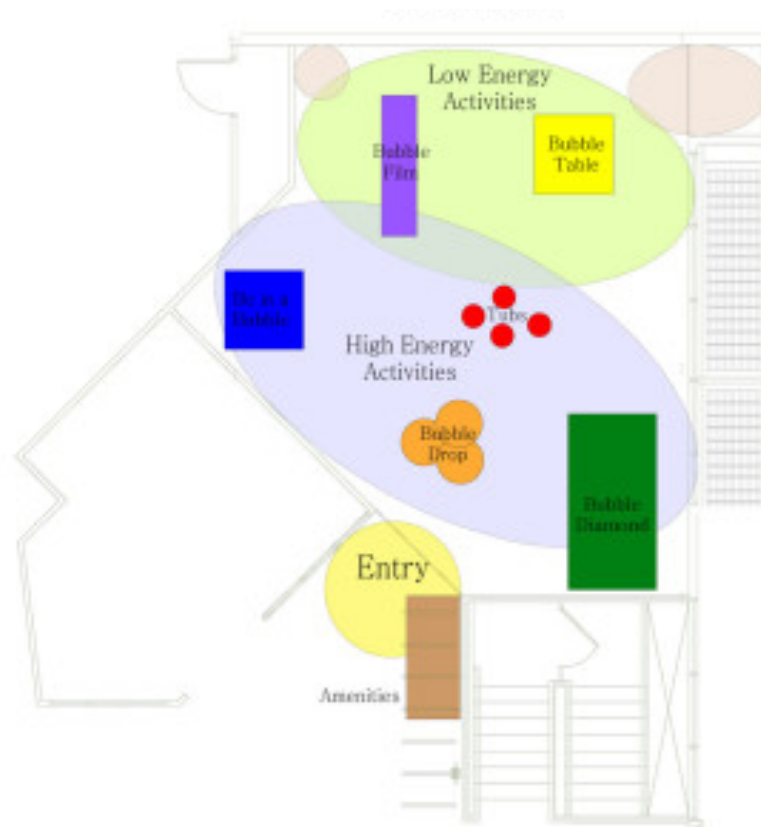


## Nurturant



# Summary

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# Selected Publications

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- K. Chuang and C. C. Yang, “Interaction Patterns of Nurturant Support Exchanged in Online Health Social Networking” *Journal of Medical Internet Research* 2012; 14(3):e54. URL: <http://www.jmir.org/2012/3/e54/>
- K. Chuang and C. C. Yang, “Informational Support Exchanges on Different Computer-mediated Communication Formats in a Social Media Community of Alcoholism” *Journal of American Society for Information Science & Technology* (forthcoming)
- K. Chuang and C. C. Yang, “How Do E-Patients Connect Online? A Study of Social Support Roles in Health Social Networking.” *Conference for Social Computing, Behavioral Modeling and Prediction (SBP 2013)*, Washington, DC. volume 7812. p:193-200. doi: 10.1007/978-3-642-37210-0\_21

# Contributions

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- Recommendations to design online intervention program
  - Assists efforts to promote healthy behaviors
  - Identifying these users would be useful for targeting messages to segmented groups
- Show that people still behave in a way parallel to offline world
- Multiple techniques to find new patterns in use of CMC formats
  - Compares multiple CMC formats **within** an online community (rather than across communities)

# Discussion: Participation

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- Participation influenced by social-psychological reasons...
  - information needs, desire to be altruistic, stigmas
  - Social Roles (i.e. caretaker, patient, nurse, friend, etc)
- The more time people spend in an online group, the larger their online social network and the higher the satisfaction with the received support.

# Discussion: New Media

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## Early Web 2.0

- Elements:
  - Post a group message
- Shared community
- Examples: Discussion boards, Email lists, Q&A

## Social Network Sites

- Elements
  - Profile + Declare people as friends + Write Public comments
- Ego-centric community
- Examples: twitter, facebook, myspace

# Discussion: Technology Design

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- SNS software design emphasizes relationships
- SNS give users a sense of egocentric community
- Inherent design differences – relationship structure, communication properties
- SNS can be used for healthcare needs to stimulate relationships between users.
- Some formats such as Journal/Notes lead to greater levels of intimacy and stronger social support
- Virtual support complements real-life social relationships with fewer stigmas

# Limitations

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- Cannot generalize alcoholism community to other health conditions.
- Content analysis technique can be made stronger
  - i.e. use Key Phrases for content analysis to have reproducible results



# The End.

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**THANK YOU.**

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