INFORMATION GAIN IN INTIMATE PARTNER VIOLENCE

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ABSTRACT

Technology has undeniably become an integrated component of day to day life. From Google Maps replacing the GPS system that comes in many cars, to Facebook connecting friends and families from thousands of miles apart, there's no end to the impact that technology has had on society as a whole, in essentially every realm. However, with further integration of technology into daily life also comes a growth in the number of nefarious ways that technology can be utilized. This paper seeks to better understand how individuals are gaining information in regards to technology mediated intimate partner violence, or IPV. Technology mediated IPV has become a new avenue of concern for individuals who often work directly with victims of Domestic Violence such as social workers (Woodlock, Mckenzie, Western, Harris, 2019). We sought out and scraped hand selected forums and then performed qualitative coding on the resuling data. Ultimately, a number of distinct patterns were revealed. Namely, a community that essentially validates, normalizes, and encourages use of technology in IPV was unveiled. In addition to this, targeted advertisements for tools that could be used for IPV taking advantage of potential abusive situations.

CHAPTER 1

INTRODUCTION

Over the past decade, technology has developed at an astonishing rate. More and more of the world is becoming easily accessible, connecting people in new and exciting ways. This exponential growth of technology has impacted every aspect of society in lasting and transforming ways. This realm of impact also contains intimate relationships or, more specifically, interpersonal relationships that involve physical or emotional intimacy. Not only are individuals in intimate relationships real lives intertwined, the technological components of their lives also become weaved together. Notably, this connection allows for a possible additional vector that could potentially be utilized by one member of the relationship to prey on the other member, also known as technology mediated intimate partner violence or IPV. Technology mediated IPV can take on a number of different forms but essentially is encompassed by any means of surveillance, stalking, or unwarranted online activity by an abusive partner (Freed, et al., 2017). While IPV has been around far before the dawn of technology, the evolution to utilize technology, as it becomes more integrated in every aspect of an individual's life, provides a new realm of danger for victims of these situations. Through this research, we sought to divulge the means by which abusive partners learn about abuse online with the hopes of using this knowledge to further mitigate abusive situations.

CHAPTER 2

RELATED WORK

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timate partner aggression? Computers in Human Behavior, 50, 197–204. doi: 10.1016/j.chb.2015.04.001

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CHAPTER 3

APPROACH

To begin the exploration, we first began by identifying the potential sources of information pertaining to technology based IPV on the Internet. We began with 3 seed forums, MarriageBuilders, TruthAboutDeception, and LoveShack. These forums were previously known for being relationship-centric and containing potentially IPV related content. Then, using the SemRush Search Engine Optimization tool, we found a few competing forums: Surviving Infidelity and a subforum within Cellphoneforums. These 5 forums ranged from being centered around seeking and receiving relationship advice to sources of technical information. This was chosen as our starting point given that we had insight into the information that existed on the website, it was easily accessed, and could be observed and analyzed without interacting directly with the websites.

3.1   Scraping Forums

To acquire the forums in a form that would be ideal for qualitative coding, the data from each forum was scraped using the pipeline pictured in Figure 3.1 and was represented in the CSV in the format pictured in Figure 3.2. We found it notable to include as much information as possible for potential further analysis into the frequency of posting, notable users, as well general timeline between different posts in a thread.   Based on the data scraped from these forums, we then proceeded to perform qualitative coding to determine patterns and thoroughly analyze the retrieved data.
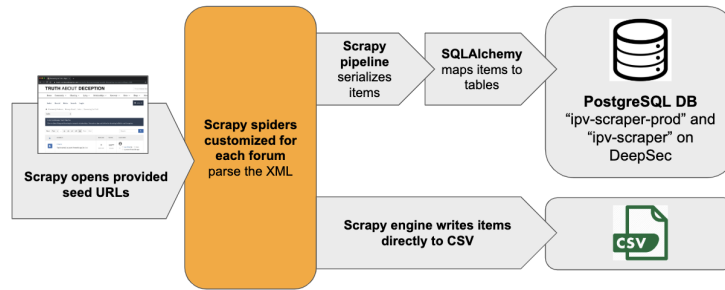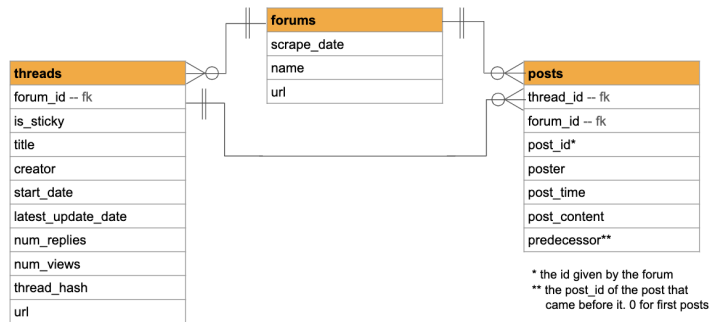
Figure 3.1: System Architecture

Figure 3.2: Scraping Output

3.2 Qualitative Coding

We performed qualitative coding in an iterative, methodological manner. We first began with 3 individuals coding the same 5, hand selected threads from the MarriageBuilders forum. This forum was chosen as it was assumed that it had the most relevant amount of posts. The only criteria for the selected forums were that they were classified as relevant by roughly developed classification algorithms and had at least 2 posts. Each of the 3 individuals created a codebook based off of these 5 threads and then met to discuss. After discussion, one authoritative codebook was developed. This process was repeated twice with a set of 10 threads from the same forum, fulfilling the same criteria, at

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which point the codebook reached stability. The group then proceeded to divide up and code the entirety of the MarriageBuilders forum, which ultimately contained 268 posts. Of the 268 coded threads, 220 were found relevant while 46 were not. Relevancy was based upon the inclusion of IPV related content in the posts within each thread. The utilized codebook can be found in Figure 3.3. We then proceeded to code Truth About Deception as well as Cellphoneforums in the same manner.

Through the qualitative coding, we particularly sought out patterns in behavior. If multiple threads were found to follow a particular pattern, that would potentially present an opportunity to detect and disrupt the behavior early on in the discovery phase.

Code	IRR?	Note
"hack"	Objective	
access accounts / get around passwords		
access backups		
access cellphone bills		
access physical device		
accidental surveillance		
attack development / social engineering	IRR	thread-level? use to tag everything in a back-and-forth process of coming up with an attack with a poster
audiovisual recording / listening / watching		e.g. voice recorders + cameras
cloud / shared accounts		
culture		category
divorce case		
do not use this hacker / tool		
emotional advice		
encouraging transparency		e.g. responder encourages poster to tell the victim about spyware
flag		use to flag particularly powerful quotes
getting around 2FA / victims being notified		use for stuff like perpetrators concerned about being found out, and also stories where victims receive notifications about account access e.g. from Google
getting around password		
giving permission		e.g. responder makes spying seem okay
google this		e.g. responder suggests that a poster do a Google search for spyware tools
hacker / tool ad		
kids		
location tracking		
moderation: governance		e.g. forum moderator speaks up and outlines appropriate behavior
moderation: norm enforcement		e.g. another user, NOT the moderator, speaks up to outline appropriate behavior
paying for tools		
pornography		
reading emails / texts		
recommendation		category
referring to another thread		
remote attack		
seeking		category
social media		
story		category
technical advice		
tracking browsing activity		
tracking keystrokes / keylogger	Objective	
unclear		use to flag things you can't make sense of quite yet
using slang		
value signaling / expressing disapproval		feigning being good
vector		category

Figure 3.3: codebook

CHAPTER 4

DISCUSSION

Through qualitative coding of the posts on these forums, I deduced 4 main themes in regards to technology mediated IPV and how information is being accessed and propagated.

4.1   Redirection towards IPV

While some of the analyzed forums were explicitly used for technical advice, some of the forums, namely Truth About Deception and MarriageBuilders, were geared towards typical relationship advice. On these forums, individuals would generally post about problems or concerns that they are having with their intimate relationships, either to share their concerns or to seek out advice, usually with a story with some level of detail. Consequently, many of the relevant posts begin with a seemingly innocuous intention. However, the norm moderation on these forums often lead the original posters, through recommendations, towards IPV related tactics. This is often noted by the code "norm enforcement" or "giving permission".

This trend is particularly noteworthy as it essentially makes forums, such as the ones analyzed in this paper, breeding grounds for technology mediated IPV. Individuals with innocent intentions are being persuaded to consider tactics that they may not have previously considered and being convinced by participants in these forums that these actions are justified based on their description of the situations. Not only is the norm to recommend tactics that fall into the cate-

gory of IPV, but also to craft the attack, with detailed recommendations of what tools to use, potential best timing for the attack, and overall how to go about gaining the insight they desire. Overall, these forums are creating norms and a community that unstigmatizes these breaches of privacy and abusive behavior.

4.2 Actively seeking out IPV

Another common theme, particularly in the MarriageBuilders forum, was individuals who were specifically seeking out tools to utilize for IPV situations. Often, these requests would be prefaced with a story, seemingly to justify their request, as well as to give context. The norm following these requests was, again, to assist in crafting an attack. Aside from just tool recommendation, posters would device a plan surrounding the use of that tool. An example of this type of interaction can be found below in Figure 4.1.

username	post_time	post_count	post_content
Chloe1	2019-05-21 3:39:	0	b'My husband was an affair. and now i wanna be sure that he is not contacting this woman again.\nI know that he was talking to her in fb messenger but deleted all the messages.\nis there any good idea?'
living_well	2019-05-21 13:2	1	b'Try this, it might help \nGeneral rule of thumb is that nobody deletes anything unless they have something to hide. So if your husband is deleting messages, he is still contacting her. Spyware is the best because it catches every keystroke.'
Chloe1	2019-05-22 2:43:	2	b'I allready try this but didnt restore anything. Before that he was texting her and deleted everything. Now he promised that he is not contacting her anymore and it is all over but I just wanna be sure about that. Spyware is good but when i was trying to put this on there was double apple security in his icloud account. i reseted the password when he was sleeping but i needed his phone to enter a code for the double security but i cant get him phone. In a morning he got mail that someone his logged on his icloud.'
goody2shoes	2019-05-22 3:20:	3	b'Next time, first test on your own device. \nDoes he use WiFi on a shared router? Can you acces data use of the modem?'
Chloe1	2019-05-22 5:59:	4	b'yes i can, we have home wifi'
goody2shoes	2019-05-22 6:30:	5	b'Google the possibilities of your modem. Google "How to monitor WiFi traffic" or "monitor internet traffic" + name/type of your modem. It shouldn\'t be too hard to get access to your own modem.'
goody2shoes	2019-05-22 8:20:	6	b"By the way, based on the info you have in your thread, I'd say the affair isn't over, so snoop carefully and don't get caught. This is not a sprint, this is a marathon. The strategy to finish the marathon is to be well prepared. \nVAR, GPS and internet monitoring should get you info. If he doesn't suspect being monitored, he will not go underground. If he finds out you can monitor WiFi data, he will use mobile data. So set it up while you are all one. Don't use a shared profile on a shared pc for monitoring. Don't get caught."

Figure 4.1: One user developing an attack for another user.

Notably, in the rare case where an individual would advise against the use of IPV related tools, a forum moderator would appear to essentially discount that opinion with a justification for the use of IPV related tools or tactics. An example of this can be found below in Figure 4.2. Ultimately this indicates a different,

Everthesame	2012-02-13 10:3	10	b'I think if you are expecting him to be honest and transparent, then you should be as well. His actions are speaking volumes about him being trustworthy. At some point, we have to stop the spying and go with our gut. You say that he is doing everything right and is allowing you access to his phone. That is awesome and a very good sign. \nI can understand you being insecure but you need to trust, and verify if you feel that you need to.'
kstockett	2012-02-13 11:1	11	b'thank you, exactly what I needed to hear.'
MelodyLane	2012-02-14 8:48:	12	b'RQ, with all due respect, that is very bad advice. Spying is not untrustworthy behavior and can never be reliably replaced with one\'s "gut." Cheating and lying IS untrustworthy behavior; not spying. Radical honesty does not include being "transparent" about spying. Obviously, her spying would be worthless if he knew what she was doing. Radical honesty and the POJA do not apply to spying after there has been an affair. \nkstockett, you need to continue to spy as much as you see fit. And NEVER be transparent about it. Spying will not only help restore your trust in him, but will give you great peace of mind. It is not a lack of trust that ruins marriages but a lack of boundaries. \nStopping spying will not make you feel better and will not make you trust him more, it will increase your anxiety and make you trust him LESS. That is not good for your marriage.'

Figure 4.2: One user discouraging the use of spyware followed by a known moderator discounting that opinion.

but very similar dynamic. This behavior continues to validate and normalize abusive behavior. While, in these cases, these individuals are actively seeking out this information, the forums serve as further confirmation bias in regards to the validity of their actions.

4.3 Targeted Advertisements

On the forum dedicated to technical advice regarding cell phones, Cellphoneforum focusing in the Spyware section, a different phenomena occurred. As this site was not intended to be used as a means to communicate about relationship problems, the typical structure found in the other forums, namely a story to some extent followed by a request for either advice or a tool recommendation, did not exist. In general, these forums had minimal back and forth between authentic users. Rather, there were a few key usernames that followed essentially

the same pattern throughout almost the entirety of the coded data.

The pattern was composed of one of the key usernames, potentially a moderator, posting a request that might have been typical for a site of this nature. These requests ranged from seeking vague information on how to gain information from one's own phone to how to track kids, an example being Figure 4.3, to concerns of a cheating partner. These requests were then followed by a recommendation to a particular tool or platform by another key username. Often the recommended tool did not align or fulfill the request from the original poster, an example being Figure 4.4, at all but the platform recommendation was exactly the same every single time. This is notable as it indicates that these key users may be attempting to utilize their perception of potential common searches to drive traffic towards both their thread and, subsequently, the advertised tool.

This phenomena ultimately plays into a larger problem overall. The problem is the idea that the technology that is often used in technology mediated IPV is rarely, if ever, advertised as such. More often, it is advertised as a tool to keep track of your children or to access your own data or information. Yet, individuals who are somehow related to these tools, assumed from the fact that they would gain something from their efforts on these forums, are using IPV situations as essentially keywords to attract users towards their tool. Ultimately, the bigger question then becomes do the creator of these tools have any liability in the outcome of how their tool is ultimately utilized.

ikeymonitor	2014-09-24 18:2	0	b'My daughter has a Samsung t239 phone. Is there a way to monitor her text messages?\xe2\x80\xbaSee More:How can I spy text messages on Samsung t239'
closebeauty	2014-09-24 22:1	1	b'iKeyMonitor Mobile Spy Key logger- Run instealthinvisiblySPY.Spy on websites visitedSpy on SMS, WhatsApp MsgSpy on KeystrokesPasswordsSend the logs to you by Email/FTPSpy onFacebookMsg, Skype, IM+, Kik, Viber... and more...For iPhone, iPad, iPod Touch:Download in "Cydia" for Free - 100% FULL Functional !For Android, BlackBerry, Windows Phone, Symbian:Get Mobile Spy - Cell Phone Spy !'

Figure 4.3: A super user posing as an individual seeking out information on how to track their child.

Maria_mole	2013-02-27 12:4	0	b'Hi i would really like to know all of my boyfriends where abouts i feel like he is cheating on me and i want to get to the bottom of it\xe2\x80\xbaSee More:How can i check my boyfriend text messages without him knowing ? 100% FREE'
closebeauty	2018-03-21 20:3	1	b'iKeyMonitor Mobile Spy Key logger- Run instealthinvisiblySPY.Spy on websites visitedSpy on SMS, WhatsApp MsgSpy on KeystrokesPasswordsSend the logs to you by Email/FTPSpy onFacebookMsg, Skype, IM+, Kik, Viber... and more...Download Free Trial:Download 3-day Trial for Free - 100% FULL Functional !'

Figure 4.4: Two super users posing in a forum.

4.4   Giving Permission and Community Formation

Overall, the largest concern, in my opinion, across all forums that were coded is the norm enforcement and giving permission. While providing the tools to participate in IPV is detrimental in and of itself, I believe that allowing IPV ideologies to be openly discussed as normal and reasonable paths of action is a bigger problem. These forums provide a place for individuals to validate their own reasoning and actions that ultimately would prove harmful to others.

In addition to this, these forums pose as a form of community, with unifying slang and ideologies, where individuals partaking in IPV can collude together and progress individual plans and thoughts to an extent that becomes more and more exceedingly dangerous and intrusive. While a counterargument may be that inhibiting discussion related to these topics in open forums would just drive individuals to more covert venues, I believe that the majority of individuals who use these sites as sources of information are not technologically savvy

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enough to find covert venues and would therefore be ultimately less likely to progress their own ideas to the same extent that these forums allow.

4.5   Limitations

A large limitation of the research performed is access to information. While we explored a few of the many avenues through which individuals gain information on how to perform IPV, we are limited by the venues that are openly and widely available on the Internet. There are undeniably other sources of information that exist, both on the Internet and elsewhere, that are not as overt and seemingly easy to find. These alternative sources of information would undeniably enrich the data and information that was found and further contextualize the best approach to assisting victims of IPV.

Another limitation of this study is that it is heavily based on assumptions. All of the conclusions drawn from the posts are assuming the intentions prior to and following the interactions on this website. There is no definitive way to ensure that these individuals actually partake in IPV or their inherent perspective or intent based on the information that is being shared on these websites.

4.6   Future Work

Moving forward, appropriate next steps in gaining insight into how individuals gain information about IPV is to access sources that are not as readily available. While relationship and spyware forums are a notable starting point, as previ-

ously mentioned, there is undeniably other more covert sources of information. Examining behavior in those sources would add a more well rounded image of how IPV attacks are being developed, what tools are being used, and what can ultimately be done to inhibit them.

In addition to this, another valid next step would be developing a robust list of technology that is known to be used in technology mediated IPV situations based on the recommendations from these forums. Based on this list, then building mechanisms to detect the use of these technologies for domestic violence clinics in order to eradicate or block them from remote use.

CHAPTER 5
CONCLUSION

Overall, I believe that qualitative coding of a number of relationship and spyware forums for IPV related content unveiled interesting behavioral patterns and communities that can ultimately be used as stepping stones towards decreasing the impact that technology mediated IPV has victim's lives. While a number of different components of the problem of technology mediated IPV remain to be truly understood and deconstructed, the insight gained through this paper is undeniably a step in the right direction. However, as further components are researched, the question then becomes to what extent can abusive individuals truly be hindered. When it comes to something as vast and expansive as the Internet, there likely exists no one solution to prevent the spread of this information.

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Woodlock, D., Mckenzie, M., Western, D., & Harris, B. (2019). Technology as a Weapon in Domestic Violence: Responding to Digital Coercive Control. *Australian Social Work*, 1–13. doi: 10.1080/0312407x.2019.1607510