

Cybercrime Trajectories: An Integrated Theory of Initiation, Maintenance and Desistance

Alice Hutchings

Technological advances have increased the reach of offenders as well as the vulnerability of potential victims. However, cybercrime offenders are a hidden and hard-to-access population. Despite the challenges involved, there are a number of innovative studies examining different samples of cybercrime offenders. This body of research indicates that cybercrime offenders are a disparate set. The theory outlined in this chapter encompasses and unites these differences to describe the two different paths that offenders make take towards committing cybercrimes that compromise data and financial security, commonly referred to as "hacking" and "fraud." These pathways account for differences in cybercrime offenders, such as age of onset, technical expertise, gender and life experiences. This theory, which integrates elements from existing criminological theories, also describes why online offenders continue and escalate their behaviors, and why they stop.

Theoretical Perspectives

Many cybercrimes are not unique, in that they reflect crimes that also take place in physical space. However, it is the environment, or the "bottle," to borrow Grabosky's (2001) analogy, in which offenders operate that makes these types of offences distinctive. For example, an individual cannot necessarily engage in offending that requires a high level of technical knowledge without first obtaining that requisite knowledge. However, it is not just the technical

that is required, but information about the criminal market, and gain a reward or benefit from offending.

A range of criminological theories that provide insights into different aspects of offending. These include innovation (for example, Merton's structural strain theory), learning and the influence of others (Sutherland's theory of differential association), how offenders perceive the success of their actions (Sykes and Matza's (1957) techniques of neutralization), and the drive for gain with (dis)regard for the consequences (Clarke's (1985) rational choice theory).

?'s Structural Strain Theory

's structural strain theory, originally developed in 1938, is based on the idea that those who are unable to achieve culturally defined goals experience strain. Goals are culturally specific, for example, "the American Dream" (Vold, 1968, p. 190) of wealth, as are the approved means of achieving them, hard work, honesty, education and deferred gratification" (Vold, & Snipes, 2002, p. 136). While society maintains that these goals are achievable by all, the social structure means that not everyone has equal access to resources to achieve those goals, such as a good education and access to opportunities. Depending on their commitment to the goals and means, those who experience strain, usually members of the lower class, use one of the following modes of adaptation: conformity, in which both the goals and means remain important; innovation, in which goals remain important but the means are changed; ritualism, in which the rules or the approved means of obtaining them do not; retreatism, which involves abandoning the goals due to their inability to be attained, and bidding by the institutional norms; retreatism, which involves rejecting the goals as well as the means; and rebellion, which is rejecting the goal and substituting them with new ones (Merton, 1968).

Five modes of adaptation, conformity is the most common (Merton, 1938). Innovation, retreatism and rebellion are those that can lead to deviant behavior. Innovation is considered to be the principal mode of adaptation that leads to crime (Vold et al., 2002). While still striving for their goal, offenders use innovative means to achieve this, such as various means of property or white collar crime that generate income (Merton, 1968). It is reported that the least common type of adaptation (Merton, 1968) is drop out of, or escape from, society and potentially engage in criminal behavior such as drug use. They are reportedly the "psychotics, autists, outcasts, vagrants, vagabonds, tramps, chronic drunkards and drug

addicts" (Merton, 1968, p. 207). Rebels, who substitute the culturally approved goals with alternative goals, may become criminally involved if associated with activities such as violent revolution or terrorism (Vold et al., 2002).

It is possible to envisage how the three modes of adaptation that could lead to crime can be applied to different types of cybercrime. For example, innovators, who aim to achieve goals by any means, could turn to computer frauds and other activities that may lead to financial gain. Similarly, rebels may be involved in hacktivism and online sabotage, while retreatists, compelled to escape from the real world into the cyber realm, may become the "computer burners, compulsive programmers" (Levy, 1984, p. 125), entangling themselves within the "computer underground" as they do so.

Sutherland's Theory of Differential Association

Sutherland's theory of differential association consists of nine specific points. Summarized, these points indicate that criminal behavior is learnt in interaction with other persons in intimate personal groups. What is learnt includes both the techniques of committing crime, and motives, drives, rationalizations and attitudes (Sutherland, Cressey, & Luckenbill, 1992) either favorable or unfavorable to committing crime. Crime is committed when those definitions favorable to committing crime exceeds those unfavorable to crime (Sutherland et al., 1992).

There are two basic elements of differential association. The first is the cognitive element, or the content of what is learnt, such as "specific techniques for committing crimes; appropriate motives, drives, rationalizations, and attitudes; and more general definitions favorable to law violation" (Vold et al., 2002, p. 160). Sutherland did not specify the learning mechanisms, simply stating that "the process of learning criminal behavior ... involves all of the mechanisms that are involved in any other learning" (Sutherland et al., 1992, p. 90). The second element of differential association is the associations with other people in intimate personal groups where the learning takes place (Vold et al., 2002). In explaining why different people are exposed to the same social conditions may or may not conduct criminal behavior, Sutherland claimed that it is the meanings that they give to these conditions that they experience that determines whether they violate the law. These meanings vary with the frequency, duration, priority and intensity (Sutherland et al., 1992) of the associations with criminal groups.

Hollinger (1993), while not organizing his study of software piracy and unauthorized computer account access around a theoretical perspective, included variables measuring participants' friends' involvement in these types of

Sykes and Matza (1991) extension of legal defenses were seen as legitimate. An interesting defense to be crimes, sometimes they argued compelled & Urbas, 2004). Such responsibility posed by Sy McQuade (2006b) stated for cybercrime as the p deny injury or deny the Since they cannot victims, if they are computer systems; whose livelihoods 2006b, p. 160). Yar (2005) also states that as "intellectual curiosity edge, a commitment to political authority proving computer security with safeguarding social neutralizations aimed by Grabosky (2005) it claiming that no harm such as Microsoft could A study by Turgert with 54 Israelis who e ing to determine whether Goldschmidt (2009) fo that "downloading in the victim by justifying "enemy" such as Nazis who prevent access to higher loyalties, especially, Turge-man-Goldberged in denial of responsibility. In comparison, We determine its explanation

Sykes and Matza's (1957) theory of neutralization is that offenders learn to use techniques to justify or neutralize acts that might otherwise produce feelings of shame or guilt, and distinguish between appropriate and inappropriate targets for deviance. Matza (1990) maintained that those that commit crime are not fundamentally different from those that do not; in fact they spend most of their time behaving in a law abiding way. Matza's (1990) claimed that most delinquents drift in and out of crime, enabled by the loosening of social control. The conditions that make this drift to criminal behavior possible include the use of the techniques of neutralization. These techniques are: to deny responsibility, to deny injury, to deny the victim, to condemn the condemners, and to appeal to higher loyalties (Sykes & Matza, 1957).

Matza (1990) was particularly interested in explaining why people generally stop offending as they grow older, which he claimed was not adequately explained by other sociological theories. Therefore, his drift theory is particularly applicable to juvenile delinquency. As juveniles are uncommitted to their deviant behavior they are free to drift between conventional and unlawful activities (Velarde, 1978). Matza (1990) clarified that the drifters, or juvenile delinquents, explained by his theory did not include all offenders, particularly those who are "neurotically compulsive" and those that develop commitment towards offending.

Sykes and Matza's Theory of Techniques of Neutralization

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Sykes and Matza (1957) argued that techniques of neutralizations were an extension of legal defenses to crime, such as provocation or self-defense, which were seen as legitimate by those utilizing them but not by the justice system. An interesting defense that has been raised by some defendants accused of cybercrimes, sometimes successfully, is that of addiction to computers, which they argued compelled them to act in the way that they did (Smith, Grabosky, & Urbas, 2004). Such an excuse would relate to the technique denial of responsibility posed by Sykes and Matza (1957). McQuade (2006b) states that neutralization theory is a sound explanation for cybercrime as the physical removal from the victim allows the offender to deny injury or deny the victim with ease:

Since they cannot see the Internet or the people who create content, victims, if they are contemplated at all, become faceless entities, computer systems, or perhaps corporations rather than real people whose livelihoods and wellbeing are compromised . . . (McQuade, 2006b, p. 160).

Yar (2005) also states that hackers' self-purported motivations for offending, such as "intellectual curiosity, the desire for expanding the boundaries of knowledge, a commitment to the free flow and exchange of information, resistance to political authoritarianism and corporate domination, and the aim of improving computer security by exposing the laxity and ineptitude of those charged with safeguarding socially sensitive data" (Yar, 2005, p. 391) may be forms of neutralizations aimed to overcome guilt. Additional neutralizations proposed by Grabosky (2005) include blaming the victim as being deserving of attack, claiming that no harm was done by looking at the data, that corporate victims such as Microsoft could afford it, or claiming that everyone else did it.

A study by Turgeman-Goldschmidt (2009) involved in-depth interviews with 54 Israelis who engaged in hacking, software piracy and phone phishing to determine whether they neutralized their offending behavior. Turgeman-Goldschmidt (2009) found evidence that these offenders: deny injury by claiming that "downloading information is copying rather than stealing" (p. 325); deny the victim by justifying their actions as revenge or targeting sites owned by the "enemy" such as Nazis and Microsoft; condemn the condemners, such as those who prevent access to the information that they are seeking; and appeal to higher loyalties, especially the hacker ethic of freedom of information. However, Turgeman-Goldschmidt (2009) found no evidence that these offenders engaged in denial of responsibility.

In comparison, Walkley (2005) analyzed techniques of neutralization to determine its explanatory power in relation hacking and online fraud, concluding

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ing that there was strong support for denial of responsibility and mixed support for the other techniques of neutralization. Using open source data Walkley (2005) claimed that, when Internet addiction, as a mental health problem, has been used as a defense in court, the defendants were neutralizing their actions by denying responsibility. Walkley (2005) also stated that two defendants, who claimed that their computer had been infected with a virus or trojan which had caused the damage they were charged with, were also engaging in denial of responsibility, despite the fact that in both instances the defendants had been acquitted and therefore were found not to have been responsible at all.

Clarke and Cornish's Rational Choice Theory

Rational choice theory assumes that offenders calculate the perceived costs and benefits of crime with the assumption that they seek some type of advantage from their actions, be it "money, sex or excitement" (Cornish & Clarke, 1987, p. 935). Clarke and Cornish's rational choice theory looks at how offenders in particular situations make these calculations (Vold et al., 2002). The theory acknowledges that offenders' perceptions of costs and benefits can be subjective, "constrained as they are by time, the offender's cognitive abilities, and the availability of relevant information" (Cornish & Clarke, 1987, p. 933), and therefore may not be rational at all (Akers & Sellers, 2004).

Other "choice-structuring properties" (Cornish & Clarke, 1987, p. 935) are offence specific. For example, when offenders weigh up the type and amount of benefit likely against the perceived risk of detection and punishment, they take into consideration their skills and the skills needed to successfully commit the offence, and the availability of necessary equipment or situations (Cornish & Clarke, 1987). In addition, each of these considerations may not have equal weight. For example, a high likelihood of detection may be more influential in deterring crime than harsh punishments (Clarke, 1997).

In a study by McQuade (2006b) examining students' perceptions of being caught for a variety of technology enabled crimes, it was found that respondents believed that the likelihood of being detected was low, and that the punishment for those that were caught was not severe. Hollinger (1993) measured university students' perceived chances of being caught accessing a computer account without authorization and found that self-reported involvement in this activity was not related to the perceived chance of being caught.

While each of these theories, on their own, provides a unique insight into the nature of online crime, none provide a complete understanding of these offenders. Hutchings (2013b) tested these theories, and others, to identify which aspects could be integrated into one theoretical model. Further devel-

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oping and expanding the work by Hutchings (2013b), this chapter outlines an integrated theory, incorporating rational choice theory as well as differential association, techniques of neutralization and structural strain theory, to explain two distinct sets of cybercrime offenders. These are *technical* cybercrime offenders, who require specialized knowledge and understanding of computer systems, and *general* cybercrime offenders, who use computers to carry out their offences, but not at an advanced level. Informed by data from active and former offenders, the theory identifies two pathways to cybercrime. The first, more general pathway, is one of strain combined with presented opportunity, such as in the workplace. The second, technical, pathway involves differential association, or the influence of others, coalesced with learning. However, maintenance and desistance from cybercrime follow similar trajectories regardless of the initial path taken.

Some of the research presented here was undertaken to directly assess a number of criminological theories, including those that were subsequently integrated into the cybercrime trajectory theory. This work, outlined in Hutchings (2013b), involved a qualitative analysis of current and former cybercrime offenders, triangulating data from offenders, law enforcement officers, and the judiciary. However, findings by other researchers in this field also contribute to the integrated theory presented here.

Methods

The integrated theory presented here was informed by qualitative analysis of a number of datasets. Qualitative research captures nuances and provides richness to data that may not otherwise be quantifiable. In addition, qualitative research can be undertaken when the ability to meet the quantitative requirements in relation to obtaining a large, randomly selected sample sizes are less than ideal (Berg, 2007).

Court Documents

The first dataset consisted of documents for 54 court cases, in particular sentencing remarks and court judgments relating to prosecutions and extraditions involving cybercrime in Australia, the United Kingdom, the United States, and New Zealand. A systematic review of legal databases was conducted to identify relevant cases. Only documents available on public databases were identified and retrieved. As well as outlining the facts of the matter, the nature of the harm caused, and details about the lead up to the offence(s), the docu-

ments typically included factors of relevance when sentencing offenders, including mitigating and aggravating circumstances. These typically include the offender's criminal history, their level of remorse, their attitude and the level to which they cooperated with the criminal justice system, the effect that various punishment may have on the offender and the family, such as the ability to maintain employment.

Interviews with Law Enforcement

The second dataset was transcripts of interviews with law enforcement officers within computer crime or fraud specialist units from four policing agencies in Australia, namely the Australian Federal Police, the Queensland Police Service, Western Australia Police, and Victoria Police. These interviews focused on officers' experiences with, and perceptions of, cybercrime offenders who have been identified by the criminal justice system. The interviews were one-on-one, open-ended, and semi-structured. Participants were asked about their experiences with cybercrime offenders within the last five years, including offenders' characteristics and their initiation into, and desistance from, offending. It was expected that recall would be fairly accurate given the limited number of cases available.

It was considered appropriate to gather information using law enforcement officers as third parties due to the nature of the offender population, which is generally considered to be hard to access. Gathering data from third parties is consistent with prior research relating to offenders, for example, the Cambridge Study in Delinquent Development, which included interviews with parents and questionnaires completed by teachers (Farrington, 1989). The 15 law enforcement officers who participated included 14 males and one female. The interviews ranged from 32 minutes to one hour and 16 minutes in length, with an average time of 51 minutes.

Interviews with Offenders

The third dataset consisted of transcripts from face-to-face interviews with active and former offenders. Participants were recruited within Australia using snowball sampling, a non-random, purposive method. Initial recruitment used informal networks. Those known to the researcher who worked and/or studied in the IT industry were encouraged to source participants. The benefit of such an approach is that such recruiters are able to assure potential participants that the researcher is legitimate (Wright, Decker, Redfern, & Smith, 1992). Participants were also encouraged to approach additional potential par-

Participants. Recruitment search and what it In this way, participation and because control of the participants were offered stores as a thank you. Studying active as active offenders. Sutherland, 1987) and severity of those who have know that criminals, and the of institutions make observations in any be made in any hended criminal rest and imprisonment. Participants were asked additional questions tailored to be interview. The situation was at the on-one, open-ended McAdams' (2008) *Life* additional topics, including decision to start offenders, how the penalties, how skenders, why they stop. It is possible that the information provided by the participant had trouble not to give an honest the accounts of those. However, Wright and the truthfulness of accounts. They conclude that with official records, an

participants. Recruitment consisted of advising potential participants about the research and what it entailed and providing the contact details of the researcher. In this way, participants self-identified as being members of the target population and because the participants had to contact the researcher, they were in control of the amount of personal information that they provided. Participants were offered a gift voucher for a national chain of electronic gaming stores as a thank you for being interviewed.

Studying active offenders has many benefits over studying a prison sample, as active offenders may be characteristically different in their frequency, nature and severity of offending, as well as their skill levels and abilities. Supporting this, Sutherland and Cresssey (1974, pp. 67–68) state:

Those who have had intimate contacts with criminals "in the open" know that criminals are not "natural" in police stations, courts, and prisons, and that they must be studied in their everyday life outside of institutions if they are to be understood ... In this way, [s]he can make observations on attitudes, traits, and processes which can hardly be made in any other way. Also, [her] observations are of unapprehended criminals, not the criminals selected by the processes of arrest and imprisonment.

Participants were asked whether they identified themselves as current or former offenders. The answers to these questions allowed the remainder of the interview to be tailored to the participant. For example, former offenders were asked additional questions about why they ceased offending, as well as what their situation was at the time that they were offending. The interviews were one-on-one, open-ended, and semi-structured, based on a modified version of McAdams' (2008) *Life Story Interview*. Additional questions enquired about additional topics, including the age they had commenced offending, how the decision to start offending was reached, their perceptions of being caught and the penalties, how skills were obtained and improved, and, for former offenders, why they stopped offending.

It is possible that the data obtained are not an accurate depiction, i.e. that the information provided is not truthful. This may occur because the participant had trouble with recollection, misinterpreted the question or preferred not to give an honest answer. It may be asked how the researcher can believe the accounts of those who, due to the subject matter, may be untrustworthy. However, Wright and Bennett (1990) have examined the literature relating to the truthfulness of accounts given by offenders during qualitative interviews. They conclude that much information provided during interviews is consistent with official records, and that, after agreeing to be interviewed, offenders per-

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ad-ceive lying to be pointless as they may as well not have consented at all. In addition, during the interviews with active and former offenders, time was spent checking for distortions and exploring the participants' responses with them to seek clarification. Some questions were also asked in more than one way in order to compare the responses.

The researcher determined an appropriate course of action if faced with information concerning offences that were in progress, offences that were intended to be committed, or if court ordered or subpoenaed to provide evidence about participants. While the research involved people that had engaged in illegal behavior, it did not relate to the specifics of individual events, nor was it intended to expose criminal behavior. However, there was the potential for the researcher to be told about current illegal activities or those that involve serious harm. While the researcher was not under any contractual, professional or legal obligation to disclose illegal behavior, there was a moral question to consider relating to elective disclosure. To mitigate this risk to participants, they were informed at the beginning of the interview that they should not divulge any current activities, and they would be reminded of this if they began to do so.

There was a possibility that the researcher may be compelled by law enforcement or a court to disclose information. However, as the data were not collected in an identified form and remained anonymous the researcher could not disclose any identifiable information about any participants if such a circumstance arose. This means that it would have been difficult for a law enforcement or other agency to identify that data with an individual. This technique is consistent with other research relating to self-reported criminal behavior (Israel, 2004).

Of the seven offenders who participated in the interviews, five were active offenders and two identified themselves as former offenders. All participants were male. The interviews ranged in length from 45 minutes to two hours and 18 minutes, with a mean time of one hour and 39 minutes. With the researcher vouched for, the participants were cooperative and obliging. They appeared to be truthful and forthcoming during the interviews. All the interviews were conducted in public places chosen by the participant, typically a coffee shop.

Data Analysis

All interviews were transcribed verbatim, with any identifiable information replaced with pseudonyms. Coding of the data was mainly "concept-driven" (Gibbs, 2007, p. 44), in that the codes used primarily arose from the literature and the theories being used. Key theoretical concepts and how these have

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Alternatively, *general* methods include "shoulder surfing," solely employing social engineering techniques, or misusing legitimate access to a computer system. Commonly known as "insider abuse of access," this occurs when offenders abuse the trust they have been given, such as an employee or contractor accessing or altering an employer's data (Shaw, Ruby, & Post, 1998). Furthermore, some scams and online frauds may be relatively simple to undertake, such as selling products that do not exist (*general*), while others may be more complicated, including setting up fraudulent websites and distributing spam through the use of botnets (*technical*).

A confounding factor is that *technical* cybercrime offenders may still use *general* methods. Also, automated tools may be used to detect vulnerabilities and automate exploits. Examples include vulnerability scanners, remote administration programs, port scanners, sniffers and password crackers (Fur-ell, 2002). Some tools are freely available to be downloaded online, while others can be purchased from online marketplaces (Chu, Holt, & Ahn, 2010; Franklin, Paxson, Perrig, & Savage, 2007; Holt & Lampke, 2010; Motoyama, McCoy, Levchenko, Savage, & Voelker, 2011). "Script kiddie" is a term used to refer to someone that uses others' programs to obtain unauthorized access rather than developing their own (McQuade, 2006a). While some may scorn script kiddies, a technical understanding of computer systems is usually required to use automated tools successfully.

Initiation into Cybercrime Offending

The integrated theory of cybercrime trajectories identifies two distinct sets of cybercrime offenders with different pathways into the criminality. The main differentiation for these pathways is whether the offenders employ only *general* methods, or whether they are *technical* offenders, who require specialized knowledge and understanding of computer systems. In relation to initiation, general offenders begin their criminality as a consequence of the opportunity that are presented to them, often in their workplace, when they are experiencing some type of strain, such as economic problems, job loss, mental health issues, or gambling and other addictions (Hutchings, 2013b). General offenders, such as fraudsters offending in the course of their employment or on online auction sites, primarily operate alone, but (Hutchings, 2013b) their methods and inspirations can be acquired elsewhere.

This aspect of strain is based on Merton's structural strain theory, in that it is experienced by those who are unable to achieve culturally defined goals (Vold et al., 2002, p. 136). Innovation, considered to be the most important mode

of adaptation for explaining crime, is the mode of innovation that is used for this pathway to cybercrime offending. While still striving for their goal, whether it be financial success, or the gratification of other drivers, offenders use innovative means to achieve this, such as cybercrimes that provide an illicit income.

Technical offenders, while they may also be considered "innovators," have a different pathway to offending, namely through differential association. Technical offenders primarily operate with others. There are many well-developed online communities, which are used for learning and sharing information and ideologies, recruiting others to commit offenses, and trading tools (Hutchings & Holt, 2015). With an interest in computers, technology or gaming, would-be-offenders begin by communicating online, during which they learn the techniques to commit cybercrime as well as share the definitions and techniques of neutralization that enable offending to occur. This part of the theory integrates Sutherland's (1949) key points from differential association, that criminal behavior is normal behavior learnt in interaction with others (Vold et al., 2002). To illustrate, one law enforcement officer spoke about his experiences seeing young offenders becoming exposed to online criminality through online gaming communities (Hutchings, 2013b, p. 150):

I know that if you have teenage kids these days, especially boys, you see a lot of them play online games. And, you see what they get up to, and they're teaching each other. It starts with fun and games online, you know, tricking people to give up their identities or to give you property within the game and run away with it, so it all starts with fun and games. And then you find a friend who's, guess what I did the other night, so they start talking about it, and then gee, that sounds great, and how did you do that? So they start teaching each other and it escalates. So what was fun and a game, as they get older they realize well, what I was doing here, why can't I use this out here and make a bit of coin out of it.

The techniques of neutralization proposed by Sykes and Matza (1957) that Hutchings (2013b) found in use by technical offenders include denial of injury (as there is no loss to individual victims) and denial of the victim (as they do not secure their systems, are undertaking questionable activities, or are perceived to have done them wrong). Offenders sometimes avoid targets when they are seen as undeserving of victimization or there is the potential for innocent parties to be harmed (Hutchings, 2013a). Use of condemnation of the condemners as a technique of neutralization is evidenced where it is accused that the victim has caused harm to others, for example, if a military site is being attacked. Offenders also appeal to higher loyalties when their actions are

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believed to be for the common good, such as increasing transparency or revealing vulnerabilities. However there is little evidence of denial of responsibility, for example, participants advise that they consider themselves to be addicted to computers, however they do not perceive this as warranting a legal defense.

These trajectories explain the gender imbalance found in cybercrime offending. For example, more females are involved in opportunistic fraud (general offending) than technical offending. This may be due to the types of opportunities that are presented to them. Females are more likely to travel along the first (general) pathway to offending, and, in comparison to their male counterparts, many have experienced substantial strain prior to their offending (Hutchings, 2013b). The second (technical) pathway is male-dominated. Explanations for this center upon social stereotypical and learning takes place, which tends to be less accepting of those that identify as female. One young male offender, who was engaged in both unauthorized access and fraud, spoke about the reception females received in these communities (Hutchings, 2013b, p. 110):

So what happens is that when you get a girl that says she can do these things, she gets scrutinized more, people will work against her, because they hold such prejudices against her. So it's just not worth it. So the girl can either crack the shit or say nah, this isn't worth it, or she'll just have to keep slugging it out. And she'll have to be better than the boys. It's probably why a lot of them just go no ... It's way harder. They have to work. Like, to be a girl doing that sort of stuff, not only do you have to deal with dickheads that are constantly hitting on you, dickheads that think you're a dickhead, or just ragging rude people that make grossly inappropriate statements that it's just not, ok, eventually you'd just have to say it would probably have been easier to pretend to be a guy, and then say that. And it's just weird.

At first glance, there is a wide disparity in the age of cybercrime offenders (Chanler, 1995; Smith et al., 2004; Turgeman-Goldschmidt, 2005). However, the two trajectories also assist in our understanding of the age differences in offence types, as general offenders are normally older than technical offenders (Hutchings, 2013b). Advancements in age corresponds with greater exposure to scenarios that may induce strain, and a larger range of presented opportunities (Hutchings, 2013b). In relation to the second pathway to offending, young males are exposed to a subculture of gaming and online interaction that relates to their age (Hutchings, 2014).

Holt and Bossler (2014) provide an overview of research into cybercrime offenders, and identify commonalities with the research findings put forward

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by Hutchings (2013b). These include the subculture and online communication for those involved in technical offending, as well as the pathways provided through the gaming culture (Holt, 2007; Jordan & Taylor, 1998).

Maintenance

Common to both trajectories, offending behavior is maintained not only because of the benefits accrued by the offenders, but also because of the low level of risk. Offenders generally perceive the likelihood of being detected as low, and this holds greater weight than the harshness of available punishments. A young male offender, who had previously been involved in unauthorized access, advised (Hutchings, 2013b, p. 197):

Um, it is hard to get caught. The penalties are severe but, I mean, the chances of getting caught are quite low, especially if you take the proper precautions.

This supports other research into cybercrime offenders that finds that the likelihood of detection has a greater deterrent effect than harsh penalties (Hollinger, 1993; Skinner & Fream, 1997). Benefits obtained from general offence types are mainly financial, while those engaged in technical offences enjoy a greater range of benefits. These include skill development, fun and excitement, social status, power and sexual gratification (Hutchings, 2013a). Maintenance integrates rational choice theory, in that offenders weigh up the apparent costs and against the type of benefits that they seek to achieve (Cornish & Clarke, 1987).

Desistance

Desistance from offending also follows a rational choice theory (Clarke & Cornish, 1985) perspective. Offenders desist from cybercrime when they no longer receive benefits from offending or when the costs outweigh the benefits (Hutchings, 2013b). For example, some offenders stop when they no longer experience excitement or obtain a sense of achievement from their activities. The costs to offenders are not limited to the punishments metered out by the criminal justice system. As offenders believe that the likelihood of detection is low, costs associated with offending are mainly social in nature, including the amount of time they are engaged online, which interferes with legitimate em-

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employment or intimate relationships. One offender advised that he had stopped offending due to other commitments in his life, including his relationship (Hutchings, 2013b, p. 145):

Um, no real reason to be honest. Nothing really happened that I thought I'd better stop doing this. I just kind of started spending my time doing other things ... Hanging out with people in real life a lot more. Um, when I moved to [the city] I started seeing my girlfriend a lot more, so I didn't really feel the need to do it as a pastime.

Costs could also include feelings of guilt or shame, which may have previously been mediated by the Internet, as offenders are not in physical contact with victims. However, once stopped, offenders may return to the maintenance stage and resume their activities if the balance of costs and benefits is in favor of the latter. This integrated theory is presented in Figure 1.

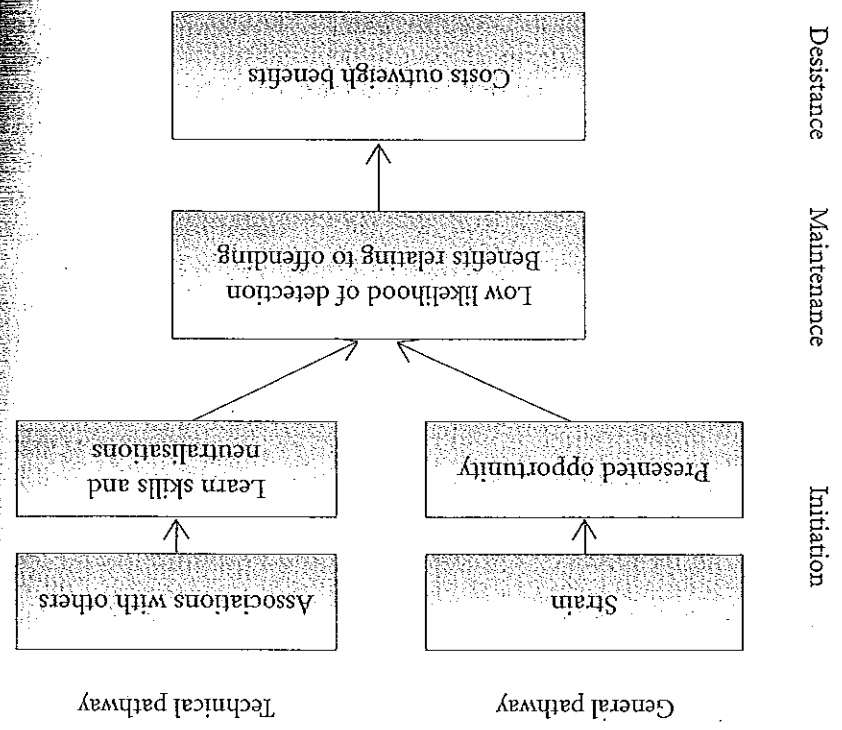


Figure 1. Initiation, Maintenance and Desistance

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Prompted by Walsh (2014), we consider integrated theory. This is particularly in the first assumption considered here, according to Walsh (2014), the operating ories is determinism, while the assumption of this will. Therefore, the assumption of this determination stage due to deterministic factors and when to stop offending, is a matter may be influenced by factors outside of it. Another assumption of this theory is that are social constructs (Durkheim, 2014). Individuals have rights, and that governments so, that we have legislation that criminalize is considered to be a crime can vary across with crimes involving computers, which car in technology which have provided compute along with concepts related to ownership, Understanding the power elements in tant to our understanding of why crime is crimes are pursued by the criminal justice differential association theory was designed by the rich and the poor alike. Sutherland and invalid" (Sutherland, 1949, p. 5). This consistently fit the data of criminal behavior theories are based on a biased sample of all the poor may be more likely to be defined as p. 5). Blaming crime on poverty does not fa Grabosky, Alazab, Bouhours, & Chon, 2011. This integrated theory of cybercrime offense

concept of "criminology of the self" Rather

Assumptions

Prompted by Walsh (2014), we consider the assumptions that underpin this integrated theory. This is particularly important with integrated theory, which may inherit differing assumptions from the original theories. This is the case in the first assumption considered here, that of free will and determinism. According to Walsh (2014), the operating assumption of strain and learning theories is determinism, while the assumption of rational choice theory is free will. Therefore, the assumption of this integrated theory is that free will and determinism are compatible. While offenders may find themselves at the initiation stage due to deterministic factors, their decision as to when to offend, and when to stop offending, is a matter of choice, noting that these choices may be influenced by factors outside of the control of the individual, and limited by reasoning abilities.

Another assumption of this theory is that crime, law, money, and property are social constructs (Durkheim, 2014). It is because society has tacitly agreed that money exists, that people can have ownership over property, that individuals have rights, and that governments that make laws have the power to do so, that we have legislation that criminalizes certain behaviors. Therefore, what is considered to be a crime can vary across time and jurisdiction, as is the case with crimes involving computers, which cannot occur without the advancements in technology which have provided computer systems, networks and the Internet along with concepts related to ownership over accounts and digital data.

Understanding the power elements in how crime is constructed is important to our understanding of why crime is committed, by whom, and which crimes are pursued by the criminal justice system. To illustrate, Sutherland's differential association theory was designed to explain law breaking behavior by the rich and the poor alike. Sutherland argued that criminological theories that relate to poverty and the conditions related to poverty are "inadequate and invalid" (Sutherland, 1949, p. 5). This is because "... the theories do not consistently fit the data of criminal behavior [and] the cases on which these theories are based are a biased sample of all criminal acts" (Sutherland, 1949, p. 5). Blaming crime on poverty does not take into account that the actions of the poor may be more likely to be defined as criminal than actions of the powerful. Revelations that nation states are engaging in cybercrimes (see Broadhurst, Grabosky, Alazab, Bounours, & Chon, 2014) may also fit the integrated theory presented here, whether it be initiating new offenders, or recruiting existing offenders.

This integrated theory of cybercrime offending aligns with Garland's (1996) concept of "criminology of the self." Rather than offending behavior arising

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Acknow

Much of this chapter at been possible without the Associate Professor Janet R Grabosky, and the assistar ice and the ARC Centre o versity. This chapter wa Department of Homeland Cyber Security Division (L the Government of Austr number N66001-13-C-013 aforementioned agencies.

from some pathological state of the offender, it is assumed that offending behavior can commence, and cease, depending on the particular circumstances surrounding an individual. These circumstances may include what access they have to technology, the types of influences they experience, their opportunities, both legitimate and illegitimate, and the community that they are in contact with, both online and in physical space.

Discussion and Conclusion

This chapter has set out an integrated theory of crime that explores the criminal trajectories for general and technical cybercrime offenders. This theory has only been developed for cybercrimes that compromise data and financial security, although it is noted that there are many offence types, including terrestrial crimes, that may have similar trajectories, and this integrated theory may be useful in providing insight into the pathways of other crime types. In addition to technical levels, differentiating factors for online offenders include age, gender, opportunities, and life experiences. At first glance, the age ranges for online offenders, when not differentiated by type of offence, appear to be similar to those of other criminal populations. The age-crime curve shows that the prevalence of offending increases from late childhood, peaks in late adolescence and decreases in adulthood (Loeber & Farrington, 2012). However, this is not true for every offence type. It is the more high-volume types of crimes that young offenders are usually involved in, such as graffiti, vandalism and shoplifting. In contrast, homicide, sexual offences and white collar crimes, which are lower in volume, but high in impact, are usually committed by adults (Richards, 2011).

Cybercrime offenders cross a range of ages; however it is the younger, male, offenders that are likely to be involved in technical crimes, compared to general cybercrime offences. While males are also more likely to commit general offences than technical offences. Older offenders are more likely to commit general, opportunistic cybercrimes. Technical offenders, through an interest in gaming and technology, are initially exposed to online communities that provide information about how to commit crime, as well as a marketplace for hacking tools and stolen data. Females, however, struggle in gaining acceptance into such communities, limiting their exposure and the subsequent development of technical expertise. These extensive online communities, including online gaming communities, can lead to cybercrime through association and the influence of other offenders.

The differences found for the skilled and unskilled offenders reflect the *who* and *what* they are exposed to, and what opportunities come their way. The Internet allows offenders to further the reach of their social groups, interacting with others across jurisdictions that they otherwise are unlikely to come into contact with. Therefore, definitions that are favorable towards offending, as well as the necessarily technical knowledge and skills, can reach a greater audience.

The majority of young offenders are likely to mature out relatively early in their life when confronted with career and relationship choices. This occurs when the costs start to outweigh the benefits that were actually obtained, as well as those that were perceived to be achievable. The benefits for general cybercrime offenders are mainly financial gain, particularly when this is used to feed drug and gambling addictions. Technical cybercrime offenders gain additional benefits, including retribution and revenge, testing their skills, and pleasurable feelings arising from excitement, power over others, and social status. Although offenders perceive the potential penalties as severe, they have a low opinion about the ability of law enforcement to investigate these matters and therefore see the chance of detection as being low, as there are steps that can be taken to hide or mask someone's identity and to launder funds in order to obfuscate the money trail. Therefore, it is the likelihood of detection, rather than the severity of punishment, that is likely to have the greatest effect on offending. Offenders cease their activities when they gain meaningful work or enter a relationship, reflecting the increased cost of their actions on their lives.

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