

Do Online Illicit Drug Market Exchanges Afford Rationality?

Author

Childs, A, Coomber, R, Bull, M

Published

2020

Journal Title

Contemporary Drug Problems

Version

Accepted Manuscript (AM)

DOI

[10.1177/0091450920934186](https://doi.org/10.1177/0091450920934186)

Downloaded from

<http://hdl.handle.net/10072/396462>

Griffith Research Online

<https://research-repository.griffith.edu.au>

DO ONLINE ILLICIT DRUG MARKET EXCHANGES AFFORD RATIONALITY?

Submission to Contemporary Drug Problems

Andrew Childs

(1) Griffith Criminology Institute, Griffith University, Queensland, Australia

Ross Coomber

(2) Department of Sociology, Social Policy and Criminology, School of Law and Social Justice,
University of Liverpool

(1) Griffith Criminology Institute, Griffith University, Queensland, Australia

(3) QUT Centre for Justice, Queensland University of Technology, Queensland, Australia

Melissa Bull

(2) QUT Centre for Justice, Queensland University of Technology, Queensland, Australia

(1) Griffith Criminology Institute, Griffith University, Queensland, Australia

Corresponding author:

Andrew Childs

andrew.childs@griffithuni.edu.au

176 Messines Ridge Road, Mount Gravatt QLD 4122

Do Online Illicit Drug Market Exchanges Afford Rationality?

Abstract

Rational choice perspectives have been the dominant models used for conceptualising the nature of exchanges in illicit drug markets, but various critiques have found these abstracted assumptions inadequate for understanding concrete illicit drug market activity. Considerably less, however, is known about key aspects of rationality in exchanges within *online* drug markets. Recognising the inadequacies of an underlying *homo economicus*, we instead conceive drug market exchanges as complex assemblages, noting how exchanges are reconstructed in online spaces, and technological affordances may facilitate elements of rationality in drug exchanges. Adopting these notions allows us to argue that aspects of rationality can potentially contribute to an understanding of exchange practices in online markets, and that online channels can afford assumptions of utility-maximisation, rich market information to guide decision-making, and anonymity in the exchange. In addition, consideration is given to the structural variability of online illicit drug markets, and that the affordance of rationality should be considered across a spectrum of applicability that takes into account the specifics of each dimension of online drug market (i.e. drug cryptomarkets, illicit online pharmacies, and “app-based” drug markets).

Key words

Rational choice theory, drug markets, exchange, cryptomarkets, neoclassical economics, affordance

Introduction

Dominant explanations of the drug-exchange process in offline¹ illicit drug markets rely on perspectives of rationality and utility-maximisation (Caulkins & Reuter, 2006; Dwyer & Moore, 2010a, 2010b; Eck, 1995; Jacques, Allen, & Wright, 2014; Jacques & Wright, 2011; Weatherburn, Topp, Midford, & Allsop, 2000). These models presuppose offline illicit drug market participants as hedonistically operating actors, who pursue maximum pleasure and minimum pain from any given drug exchange. While rational choice perspectives have been the prevailing frameworks used for understanding exchange within offline drug markets, this perspective has nonetheless been widely contested. Critical analyses have found these abstracted perspectives wanting in regard to various facets of concrete illicit drug market activity, and for oversimplifying the nature of the exchanges that actually occur in drug markets (Dwyer & Moore, 2010a, 2010b; Moeller, 2018; Sandberg, 2012). While offline drug supply relies on physically and temporally situated practices, the widespread adoption of the Internet has given rise to new methods and opportunities for supplying and accessing illicit drugs. These new forms of illicit drug supply provide an opportunity to re-assess theoretical assumptions related to the nature of exchange.

Online² illicit drug markets are located in various forms across the surface net (the regular internet that is directly accessible to casual browsing) and the dark net (requiring the use of specialised access and anonymising browsers), and through social media and encrypted messaging applications installed on smartphones. Existing research on these emerging drug markets has provided helpful descriptive overviews of market actors, and the types of drugs sold through these platforms, but there is scant attention to theoretical explorations of these new spaces of drug exchange, and importantly, how online illicit drug markets are differentiated (Coomber, 2015) from offline illicit drug markets (see Aldridge & Askew, 2017; Bakken, Moeller, & Sandberg, 2018 for exceptions). Additionally, current theoretical

assessments of the nature of exchange in online drug markets often has too narrow a focus by only accounting for one form of market and not considering how theoretical explanations vary across online platforms that may differ in meaningful ways. This article addresses this lacuna in such research.

The nature of exchange in online illicit drug markets differs from those in offline markets as online forms of drug exchange, unlike many offline markets, have digitised structures and arrangements designed to produce a context where both buyers and sellers perceive their exchanges to be safer, of better quality, more reliable, and more temporally manageable. The conditions for rational choice decision-making in online illicit drug markets appears therefore, intuitively, to be much enhanced by the structural affordances of these technologies. As a result, exchanges can include some elements of the archetypal, ideal exchanges as proposed in rational choice models compared to those found in offline instances of drug exchange. To this end, the aim of this article is twofold: to disentangle the critiques of rational-choice perspectives of exchange as they relate to offline illicit drug markets; and, through the use of assemblage-thinking and the notion of technological affordance (Latour, 2002), explore how online spaces for buying and selling drugs may afford greater levels of rationalised exchange, while taking into account the nuanced features of different online markets. We are by no means specifically ‘testing’ rational choice theory, but rather, providing a theoretical discussion that draws on the comparisons between different drug exchange assemblages (offline/online) and the affordance capabilities of online technologies for the drug exchange.

The article is presented in three parts. First, it begins with an overview of rational choice perspectives, and outlines how rational actors are expected to operate in these instances of market exchange. Rational choice perspectives have been significantly refined over time due to the over-reliance on inadequate models where actors “naturally” operate as per neoclassical

assumptions. This is followed by a critical assessment of rational choice perspectives as applied to exchange in offline drug markets, as well as how such applications have tried to accommodate various limitations. We consider why it is the case that, despite the conceptualisation of such exchanges through models of rationality, it is generally accepted that actors in illicit drug markets do not attempt to “maximise utility” at any cost as per the central tenet of rational choice theory. Moreover, individuals performing exchanges in offline markets often do not, to any great extent, consider the costs and benefits of exchanges. This may be in part due to the lack of available information that guides exchange arrangements between actors, the nature of drug-related harm and wider structural disadvantages, in conjunction with the fact that exchange parties in illicit drug markets are indeed not the anonymous agents as proposed in rational choice models. Often, these are not isolated exchanges, and social expectations guide exchanges to a greater degree than utility-maximisation. Rational choice understandings of exchange are formally abstract models whereas, for various reasons, real-life drug focussed exchanges do not always simply reflect such abstracted modelling. The third section of the article proposes that, by comparison and in relative terms, online illicit drug markets create affordances, where drug market actors participating in these specific models of drug supply can be guided throughout their decision-making processes, can draw on available information, make an active consideration of the costs and benefits involved in the exchange, and are afforded the ability to maximise their expected utility from these drug market exchanges.

The comparisons made in this article are important as they highlight how the evolving digitalisation of spaces for supplying and accessing drugs creates the condition for the changing nature of drug focussed exchanges and how we understand them through a reconstruction of the drug exchange assemblage. Rather than advocating that rational choice models become the primary mode of analysis for online drug markets and participants, and recognising inherent flaws in assuming that *all* action is purely rational, we draw on key aspects of rationality to

highlight the affordance capabilities of technologies, and to detail how certain aspects of theoretical models differ depending on the particular market under investigation. Further, by drawing attention to the structural variability of these digital spaces, the article illustrates how rational choice models may theoretically “fit” to differing degrees depending on which specific illicit drug market is being referred to. In doing so, this article contributes to the burgeoning literature recognising illicit drug markets as differentiated in meaningful ways (see Coomber, 2010, 2015) and assists future researchers in conceptualising drug market behaviour for the criminology of illicit drug markets (Moeller, 2018).

The Origins of Rational Choice and Rational Exchanges

Perspectives on human rationality across many disciplines (e.g. economics, behavioural psychology, criminology, political sciences) derive from methodological individualism and the notion that all actions are the result of easily interpretable statements whereby individuals will try to maximise their own interests (Etzioni, 2011; Scott, 2000). The origins of this perspective on human behaviour is found in Hobbes’ (17th century) assertions that humans naturally compete and fight for their own interests, and Bentham’s (18th and 19th century) claims in relation to the guiding forces of attaining pleasure and avoiding pain (Bentham, 1996; Epstein, 2013; Long, 1990). These claims have remained central to the idea of rationality but have since been refined and expressed in terms of the concept of *utility*, which is often operationalised as the propensity for actions to promote advantage, benefit, or pleasure to the individual enacting the behaviour (Kahneman, Wakker, & Sarin, 1997). Thus, when faced with different courses of action, a “rational” individual is one who will assess the likely outcomes of each action, and select the appropriate option that promotes the most benefit (Heath & Heath, 1976; Hollis & Sugden, 1993; Scott, 2000).

This perspective, which views human behaviour as fundamentally rational by way of operating through purely self-interested means, has traditionally been the primary method of understanding exchanges made in the context of markets where goods are exchanged. Smith's (1776) propositions in *The Wealth of Nations* provided an early account of the idea that individuals participating in market exchanges are inherently rational actors promoting their own interests of utility-maximisation (Ashraf, Camerer, & Loewenstein, 2005). These exchanges are presumed to occur in markets demonstrating "ideal" conditions through the mechanisms of supply and demand, the presence of perfect information related to products being exchanged, that individuals within these markets are entirely *anonymous* in the sense that nothing more is expected from the exchange but the contents of the exchange itself, and that prior relationships are not a prerequisite for participating in exchange (Alexander & Alexander, 1991; Danby, 2002; Plattner, 1983; Zafirovski, 2000).

Moving Beyond Utility-Maximisation in Exchanges

Claims that market exchanges are driven purely through self-interest and egoistic rationality may be limited in markets that do not perfectly adhere to ideal conditions and in non-western contexts of exchange (De L'Estoile, 2014; Emerson, 1976; Manzo, 2013; Simon, 1955). Early ideas for the rejection of a purely rational actor for exchanges were proposed by the classical anthropologist Bronislaw Malinowski (1922), whose research on exchange has been described as an "explicit attack on the notion of a universal 'economic man'" (Hann, 2018, p1). Malinowski's research highlighted forms of exchange that still predominantly comprised the exchange of goods between individuals, but was, as Danby (2002, p. 16) claims, "too elaborate and socially complex to be understood by conventional economic theory". These exchanges were not characterised by the presence of material profit among actors involved in the exchange. Rather, the purpose of many of these exchanges centred on the non-economic

components of community, status, and relationships rather than utility-maximisation for self-interest (Malinowski, 1922). The nature of exchanges explored in early anthropological research (see also Mauss, 1966) indicated that exchanges for goods may not always be the result of cognisant cost-benefit considerations among anonymous actors, but instead, exchanges may be the product of traditions and relationship-building among individuals (Smelser, 1992).

Another criticism of rational choice perspectives is their lack of apparent applicability in markets where economic exchanges are the primary purpose of the exchange. Because of this, many have argued for a shift away from the dichotomisation of exchange perspectives as either purely social or economic, and maintain that a blend of both exchange frameworks will be fruitful, whereby rational market-based exchanges can be embedded within social relationships and cultural expectations (Granovetter, 1985; Spiliman, 2006; Zelizer, 1988). Alternatively, social exchanges themselves can be understood through a process of considering the costs and benefits of the social exchange (Emerson, 1976; Stafford, 2008), and social networks may modify an actors' utilitarian preferences by contributing to the search for the highest quality goods (DiMaggio & Louch, 1998). The embeddedness of social relations within market exchanges is particularly evident when there are risks involved in the market-exchange, such as when there is less information to guide cost-benefit decision-making (or an asymmetrical distribution of information between exchange participants), and in particular market structures (Akerlof, 1970; Alexander & Alexander, 1991; Geertz, 1978; Plattner, 1983).

The above discussion highlights some of the various ways that notions of a purely "economic man", or *homo economicus*, have consistently been refuted and shown to be abstracted from the social dimensions of market exchanges. Experimental studies have consistently debunked the "natural" tendency for actors to operate according to principles outlined in neoclassical economics (Henrich et al., 2001; Karacuka & Zaman, 2012). On a more

macro-level, events such as the 2008 global financial crisis expose the failings of a historical hegemony of neoliberal models pertaining to self-interest and efficient, competitive markets. Understanding human behaviour through *homo economicus* alone is clearly inadequate as it relies on a limited empirical base. Thus, there is move beyond the unlimited and all-encompassing forms of rationality proposed in neoclassical paradigms, and any constructions of an “economic man” have to be philosophically, sociologically, psychologically and empirically grounded (Henrich et al., 2001; Ng & Tseng, 2008; Yamagishi, Li, Takagishi, Matsumoto, & Kiyonari, 2014; Zafirovski, 2014).

Debating the value of rational choice theory has become, as Lovett (2006, p.237) claims, “something of a *cause-celebre*” for theorists. As a result. rational choice perspectives have been refined over time, leading to current stances that individuals operate under bounded rationality (Simon, 1972) and will satisfice/optimize their preferences (Thaler, 2016). For scholarship on rational choice to progress, it may therefore be important to understand the role of rational choice in specific explanations of behaviour, and the instances where such a theory can more richly and accurately describe some phenomena over others (Hudik, 2019; Lovett, 2006). Assigning degrees of rationality to agents in the specific contexts in which they are being studied demonstrates awareness of the fact that human behaviours are socially and environmentally contextualised (Coyle, 2019), and that markets and certain situations may have unique configurations that structure the choices and decisions of actors (Biggart & Beamish, 2003; Ostrom, 2010; Plattner, 1983; Plott, 1986; Thaler, 2000). This is opposite to situating individuals within a perspective of natural tendencies to promote advantage through self-interested, maximising means.

Drug Market Exchanges as Assemblages

In taking this focus on structural differentiation, and how contexts differ with respect to aspects of rationality, we position drug market exchanges within the notion of “assemblages”. Assemblage-thinking focuses on the emergent coming together of heterogenous – and initially disparate – elements, materials, forces, spaces, bodies, procedures and interactions between all of these components to form assemblages (DeLanda, 2006; Deleuze & Guattari, 1987; McFarlane, 2011; Taylor, 2009). Assemblage-thinking is being increasingly incorporated into the analysis of contemporary alcohol and other drug use and related problems. Duff (2016), for example, suggests how assemblages emphasise the way that drug problems emerge through a cast of human and non-human actors, as well as distal and proximal forces. We use this notion to think about drug market exchanges as the formation of heterogenous components, and as situated within a complex assemblage of elements. Drug market exchanges are produced and play out in specific environments, which will have different outcomes for how theoretical models are applied to these different drug exchange assemblages.

A Critique of Rational Choice Perspectives on Offline Illicit Drug Market Activity

Many different perspectives have been put forward to understand illicit drug market activity, but none have been more dominant than insights formed through the lens of economics and rationality (Ritter, 2006). Indeed, the conceptualisation of drug markets in this manner has been so popular that Bushway and Reuter (2008, p. 434) claim that, “it is hard to imagine the study of drug markets, and illegal markets generally, without the inclusion of economists and economic insight”. As will be explored further, research adopting rational choice models posits that illicit drug markets operate in a similar manner to markets for legal products (i.e. as characterised by adherence to conditions of supply/demand, and the presence of competition), and concurrently, exchanges made by actors participating in these markets are best understood through processes of cost-benefit decision-making (Caulkins, Gurga, & Little, 2009; MacCoun

& Reuter, 1992; Ritter, 2006). Although such models have been the principal analytical framework for understanding drug-focussed exchanges in offline markets, there is generally weak evidence for the applicability of these perspectives with respect to actual exchanges that are performed throughout these markets. The criticisms of rational drug exchanges outlined below draw attention to the incorrect *assumptions* that actors involved in drug-focussed exchanges are doing so purely out of self-interest in attempts to maximise their own benefit, and are operating within the ideal market structures proposed in neoclassical economics. Offline drug markets are highly imperfect markets in this regard and rational choice frameworks of exchange only partially contribute to understanding the exchanges that actually occur within these markets.

Non-Ideal Market Structures

Many researchers have pointed to the fact that offline illicit drug markets are not overly reflective of ideal markets inhabited by rational actors as normatively proposed. Particularly relevant here is the suggestion that illicit drug markets contain many economic irregularities (Caulkins & Reuter, 2006) pertaining to market structures when compared to neoclassical economic models of markets. For example, although price elasticity is predicted in ideal markets in accordance with supply/demand, illicit drug prices commonly remain relatively stable (or have even declined) over time, despite shortages, law enforcement activity and increased demand (Best, Strang, Beswick, & Gossop, 2001; Grossman, 2005). More specifically, the risks and prices framework, which proposes that law enforcement is an added tax that is built in to drug exchanges (Reuter & Kleiman, 1986), has proven to be incomplete in explaining prices due to complications in obtaining accurate price data (see Jacques & Wright, 2008; Ritter, 2006) and evidence over time showing that tougher law enforcement does not necessarily increase drug prices in street-based markets (Pollack & Reuter, 2014). This

suggests that there is a level of price *inelasticity* that may therefore be related to factors such as cultural expectation and structural circumstance (Dwyer & Moore, 2010a; Moeller & Sandberg, 2019), beyond the control of market mechanisms of supply and demand, competition amongst sellers, the quality of drugs, or the risks/prices model of illicit drug sales.

Are Drug Market Actors Utility-Maximisers?

Social Supply and Other Forms of Altruistic Behaviour

Whilst some forms of profit-oriented drug market exchanges do appear to conform to aspects of the rational choice model, there are common forms that do not. One such form is the social supply of recreational drugs, which Coomber and Turnbull (2007) explain make up the bulk of most drug exchanges, whilst at the same time rarely “touching” the drug market proper. The social supply of drugs predominantly occurs through the sharing and gifting of substances, or through exchanges made to friends and/or acquaintances that are characterised by the lack of motivation to make financial profit in the exchange (Coomber & Moyle, 2014; Coomber et al., 2018). The social supply of drugs (and the adjunct concept of minimally commercial supply) is a conceptual framework for understanding a particular form of drug supply that is at odds with rational choice perspectives of exchange, which propose that drug sellers are inherently profit-motivated individuals. In fact, social suppliers often distance themselves from believing they are someone who makes commercially-oriented sales. The primary purpose of the exchange is for cultivating friendships, which is reflected through practices (e.g. offering discounts and the provision of free drugs) (Coomber & Turnbull, 2007; Crawford, 2016), and through the personal belief in not being “in the business to make money” (Moeller & Sandberg, 2019, p. 304). Although benefits to social capital can be derived from these exchanges (Moyle & Coomber, 2019), this is often not a dimension of utility that actors are expecting to maximise or increase because of the exchange. Even for drug sellers at different levels of illicit drug

markets, who would not consider themselves to be social suppliers, raising prices of illicit drugs in order to maximise financial profits of the exchange may be incompatible with expectations that a “fair price” is maintained (Dwyer & Moore, 2010a; Moeller & Sandberg, 2019).

Rational choice perspectives have also traditionally struggled to account for how altruistic behaviour engenders action over purely self-interested principles (Becker, 1976; Khalil, 2004). Mostly, in the context of illicit drug markets, this refers to the sharing of illicit substances between individuals. Sellers of illicit drugs may also forego profits for ideological reasons (Blum, 1972), for example, to assist those experiencing substance withdrawal (Dwyer & Moore, 2010a; Jacobs, 1996) or to facilitate their own use of drugs (Jacobs, 1999). This behaviour is highly reflective of the anthropological research previously discussed on gift-giving, relationship-building, and acts of altruism as opposed to rational-actor frameworks of market exchange (Coomber, Moyle, & South, 2016; Jacques & Wright, 2008).

Drug-Related Harms and Structural Disadvantages

The nature of drug-related harms and the wider structural disadvantages that affect individuals in certain illicit drug markets reduce the degree to which rational choice models can be relied on as the primary explanation of the nature of exchange. Assumptions of utility-maximisation in illicit drug markets stands in contrast to the reality of individuals who experience drug-related harms. Instead, when such actors are involved, these exchanges are mostly performed due to the actors’ physiological/psychological dependency on a particular substance. Though substance dependence itself has been considered through a rational choice lens (Becker & Murphy, 1988), and there may be tangential benefits relayed to the buyer in these specific situations, obtaining and maximising these benefits is not the primary essence of the exchange. In a similar vein, preferences on prices, and on the quality of the substance being exchanged, may not be taken into account as people who use drugs may, through

physical/psychological urgency, be more or less compelled to accept whatever offer is on the table (Jacques et al., 2014). Finally, a preference to self fund one's own supply through selling (as opposed to other criminal alternatives such as shoplifting, burglary, robbery or prostitution), in conjunction with wider societal or economic disadvantages, may be the primary reasons to begin selling drugs rather than for entirely profit-motivated reasons (Dunlap, Johnson, Kotarba, & Fackler, 2010; Moyle & Coomber, 2017; Werb, Kerr, Li, Montaner, & Wood, 2008).

A Lack of Information in Illicit Drug Markets to Guide Effective Decision-Making

Archetypal models of markets suggest that exchanges occur within settings where buyers are able to gather information and compare options amongst competitive sellers to enable a rational decision. The ability to use information to guide rational decision-making is rarely reflected in offline illicit drug markets for two reasons. Firstly, the illegal nature of the exchange itself restricts the ability for information on products, or sellers, to be made widely available to exchange participants (Beckert & Wehinger, 2013). Secondly, offline drug markets are usually highly fragmented or may be populated by transient actors (Denton & O'Malley, 1999; Hoffer, 2016), and thus do not share the characteristics or structures of ideal markets that facilitate drug market actors to compare options within a competitive market (Dwyer & Moore, 2010a). This lack of information in illicit drug markets creates higher levels of unknowns, and therefore greater risks are embedded within illicit drug market exchanges. Buyers cite risks involved in the exchange such as the quality of substances, the reliability of the seller of these substances, and the likelihood of detection from law enforcement (Eck, 1995; Jacques et al., 2014; Reuter & Caulkins, 2004). Although, taking the quality of substances as an example, drug buyers may rely on basic sensory tests, and suggestions of quality from dealers and members of their peer group, these methods are less reliable, and are inaccurate in measuring the quality of drugs or detecting the inclusion of adulterants even for experienced users (Coomber et al., 2014; Evrard,

Legleye, & Cadet-Taïrou, 2010). Illicit drug market actors are not afforded, to any considerable degree, information to inform to support ‘rational’ decisions as a result of competitive market structures. For this reason, it has been suggested that many street-based drug sellers will satisfice rather than maximise (May & Hough, 2004).

The Importance of “Trust” in Illicit Drug Exchanges

Exchanges performed within contexts of scarce information have a greater level of risk involved for actors. Trust, a concept generally characterised by principles of co-operation and shared norms of behaviour (Rousseau, Sitkin, Burt, & Camerer, 1998), is typically relied on in such instances to navigate uncertainties involved in the exchange process and to substitute for knowledge. However, exchange norms in the context of illicit drug sales may be “unspecified, poorly communicated, uncertain in practice, and may change at any moment” (Hoffer, 2016, p.182). Because of the illicit nature of drug exchanges, there is an inherent wariness from sellers of being exposed to law enforcement, or being robbed by buyers or other sellers, and parallel fears from the buyers’ perspective on being ‘ripped-off’, subject to violence or intimidation, or being exposed to undercover law enforcement (Eck, 1995; Jacobs, 1998, 2000; Jacques et al., 2014; Strub & Priest, 1976).

Rational choice models of exchange assume anonymity between buyers and sellers. However, in the context of drug-focussed exchanges, selling to, or buying from, unknown persons potentially exposes both parties to increased levels of risk. Because of the lack of information or security, the degree of trust between a buyer and seller is critical in overcoming some of the risks present due to the lack of information to guide purely rational exchanges (Chalmers & Bradford, 2013; Dwyer & Moore, 2010b; Jacobs, 1998; Wedow, 1979). Many drug-focussed exchanges are endowed with rich social contexts, and the social relations that emerge from these exchanges cannot be accounted for through pure rational choice models of

drug market behaviour (Dwyer & Moore, 2010b; Moeller, 2018). Specifically, models of rationality and neoclassical economics neglect such factors through assumptions of anonymity.

The Affordance of Rationality in *Online Illicit Drug Market Exchanges*

The Internet has transformed shopping practices for legal products (Doherty & Ellis-Chadwick, 2010), and similarly, illicit drug markets are now thriving in various channels across the surface net and dark net, and on apps installed on smartphones. In legal online markets, due to the vastly different nature of online retailing in comparison to physical shopfront retailing, key elements of rationality have been introduced to understand these exchanges. For instance, legal online markets provide a cognitively-rich environment for buyers allowing utilitarian motivations for control, economic utility, information, and anonymity in exchanges to come to fruition (Childers, Carr, Peck, & Carson, 2001; Elder-Vass, 2018; Martínez-López, Pla-García, Gázquez-Abad, & Rodríguez-Ardura, 2014). Furthermore, the features embedded within many online markets allows buyers to evaluate sellers, to collect information to inform a rational exchange, and to make multi-attributable comparisons that reduce the search costs associated with collecting this information in comparison to physical retail markets (Childers et al., 2001). The explanatory limits of rational choice models of exchange in relation to various offline illicit drug markets discussed thus far within this paper suggests a generally weak applicability of such approaches for understanding offline drug market exchanges. Our analysis of the nature of exchanges in online drug markets henceforth considers how the exchange assemblage is reconstructed in digital environments. Online drug exchanges are performed in an entirely different structural, and thus relational, context and this has implications for how we theorise the nature of the exchange.

Specifically, the concept of *affordance* is used here to describe how online drug markets afford elements of rationality in the drug exchange process. Gibson's (1977) early definition

of affordances relayed the complementarity of animals and environments, and specifically, that affordances are the action possibilities that exist within particular environments. Later reconceptualisations of this notion, such as Latour's (2002), focussed on removing the overly constructivist or deterministic lenses when referring to technology and humans. The relationship between human and non-human objects is one of affordance, whereby the confluence of objects and actors work together. Technologies do not determine activity, but they can *afford* different intentions, practices, decisions and goals (Bloomfield, Latham, & Vurdubakis, 2010; Faraj & Azad, 2012; Fraser, Treloar, Gendera, & Rance, 2017; Hutchby, 2001; Latour, 2002). We explore the affordance capabilities of online drug markets with particular reference to elements of rationality, noting how online drug markets have the capacity to afford new meanings and actions in drug exchange.

Surface Net, Dark Net, and Social Media Drug Markets

Illicit drug markets on the surface net (referred to elsewhere as the “clear” net) are directly accessible via conventional search engines (i.e. Google, Bing, and Yahoo). Surface net drug supply is mostly focused on the supply of new psychoactive substances (NPS) and counterfeit/prescription-required pharmaceuticals (particularly “lifestyle” drugs and performance and image-enhancing drugs) (Lavorgna, 2015; Walsh, 2011). The surface net provides for the distribution of these substances through web-stores that have their servers located in countries where it may be entirely legal to manufacture, possess and distribute these substances, and where products may also be marketed disingenuously (for example, as “bath salts” or “plant food”) in order to evade authority (Walsh, 2011).

By comparison, the deep web is the part of the Internet that is inaccessible (e.g. intranets or otherwise “protected” cyberspace) to casual browsing and searching, and is estimated to hold a much larger portion of information than is accessible through the surface net. It is in the

deep web where the so-called “dark” net is to be found where a variety of illegal activity takes place (Chertoff, 2017). The dark net is populated by websites or fora where illegal activities can be conducted, such as exchanging illegal information, discussing illegal activities or purchasing illegal products. In the current context, illicit drugs are typically sold through “cryptomarkets” (Martin, 2014a) that resemble larger e-commerce legal online markets such as eBay and Amazon (Barratt & Aldridge, 2016). Because of the anonymous and encrypted nature of drug cryptomarkets, drug sales are not restricted to products where there remains some ambiguity on the legality of the product, as is the case in surface net markets. Drugs commonly sold on cryptomarkets vary, from those taken by recreational drug users (e.g. cannabis/cannabis-related products, MDMA and other stimulant-type substances, LSD, and a range of “legal” and illegal NPS) (Barratt, Ferris, & Winstock, 2014; Van Buskirk, Naicker, Roxburgh, Bruno, & Burns, 2016) through to opiates and crack cocaine (Gilbert & Dasgupta, 2017). Many cryptomarkets contain features such as escrow payment systems, where a third-party (i.e. the administrators of the cryptomarket) hold the funds from any sales until the transaction has been “finalised” by a buyer and they are satisfied with their delivery (Barratt & Aldridge, 2016). This ensures that exchanges organised through cryptomarkets are conducted appropriately and held to standards.

Lastly, and somewhere between surface net and deep web cryptomarkets, the utilisation of social media and encrypted messaging applications has recently been acknowledged as another mechanism of drug supply through online technologies. Apps are used in diverse ways to organise drug exchanges between buyers and sellers (Demant, Bakken, Oksanen, & Gunnlaugsson, 2019; Moyle, Childs, Coomber, & Barratt, 2019), including as large-scale commercial marketplaces, but also as a preferred communication tool between sellers and their customers (Bakken & Demant, 2019; Demant et al., 2019; Moyle et al., 2019). App-based drug exchanges, unlike other forms of online drug supply, still involve a physical meeting for the

exchange of drugs, but the structural features and reliance on technology clearly differentiates this supply from the remit of pure offline drug exchanges.

Information-Rich Arenas of Drug Exchange

The resemblance of cryptomarkets and surface net drug markets to large e-commerce websites affords access to information not available in many offline drug exchanges. This is similar to other online retailing sites where information regarding retailer reliability is comprehensive and available to buyers (Bolton & Ockenfels, 2009). Drug buyers in various online drug markets are able to absorb drug-related information such as the advertised price, quality, and type of substances sold, as well as information on the perceived reliability of the seller through feedback systems (Barratt & Aldridge, 2016; Martin, 2014b; van de Ven & Koenraadt, 2017). Cryptomarkets, in particular, are heralded as solving some of the coordination problems that typically constrain informed choices in offline street-based markets, thus making cryptomarkets more structurally efficient than conventional illicit drug markets (Bakken et al., 2018), and providing drug market participants with an “abundance of drug market intelligence” (Aldridge & Askew, 2017, p. 108). Even in app-based drug markets, which feature less information available to buyers to guide them in their exchange, buyers still utilise signals (i.e. reviews from other buyers, photos/videos of products) to assess the reliability of sellers and the perceived quality of the products they are offering (Demant et al., 2019; Moyle et al., 2019). Online illicit drug markets are arenas of exchange that are comparatively rich in information. In turn, this reduces, or at least mitigates, many of the risks traditionally associated within illicit drug exchanges. By adopting the notion of affordance we can note how online illicit drug markets can afford actors the capacity to make an exchange with a considerable amount of information at their disposal, to guide the exchange process and inform rational action.

Affording Utility in the Drug Exchange

The structures of online drug markets themselves somewhat force buyers to make an active decision on the substance they want to purchase, as well as from which seller they are wanting to purchase. Whereas conventional offline illicit drug market decisions are bound by many factors as discussed above (i.e. social expectations, structural circumstances, and access), online exchanges (particularly at the dark net and surface net level), may be less explained by opportunistic or convenience assumptions for drug acquisition, but instead, actors are afforded an exchange that can be the result of expressing purposeful decisions and preferences. This process of decision-making is a direct affordance of the structural capacity of online illicit drug markets that afford utility-maximising decisions in the drug exchange process to a degree not possible in offline illicit drug markets. Indeed, cryptomarket buyers themselves frequently mention having more control and agency over their drug buying activity (Bancroft & Reid, 2015), a theme that is also applicable to other online drug buyers. Cryptomarket buyers (Barratt et al., 2014; Hout & Bingham, 2013b; Van Buskirk et al., 2016) and surface net drug buyers of lifestyle drugs (Koenraadt & Ven, 2018; Kraska, Bussard, & Brent, 2010) are drawn to these platforms to keep the financial costs of their drug exchanges low. Likewise, online drug vendors across all online domains are able to employ tactics that increase future sales and maximise the financial profits from the exchange process (e.g. charging “premiums” for taking on extra risks) (Cunliffe, Martin, Décary-Héту, & Aldridge, 2017; Ladegaard, 2018; Moyle et al., 2019; van de Ven & Koenraadt, 2017). These opportunities are less afforded by offline exchange assemblages.

Online drug buyers may seek to maximise their expected utility in exchange through a wide range of ways not available in conventional offline illicit drug markets. For example, although buyers in app-based drug markets do not tend to mention the reduction of financial costs through utilisation of the platform, preferences are expressed through the convenience

and speed of obtaining illicit drugs due to the speedy local access that app-based drug markets facilitate (Moyle et al., 2019). Additionally, cryptomarkets are used to maximise broader perspectives of utility, such as the need to remain undetected from law enforcement, and the quality of drugs that the buyers is seeking through an exchange (Barratt et al., 2014; Hout & Bingham, 2013a, 2013b). In this instance, although the quality may not apply directly to the forensic testing of the drugs (van der Gouwe, Brunt, van Laar, & van der Pol, 2017), buyers appear to be comforted in the assurances of quality that cryptomarkets provide through their feedback systems. Other marketplace features, such as the escrow payment system in cryptomarkets, provide drug buyers with enhanced assurances concerning the person they are exchanging with, as actors are effectively forced to abide by the norms of the exchange. In sum, these new exchange spaces for illicit drugs afford both buyers and sellers the opportunity to improve their decision-making in line with notions of rational choice, however it may be conceived with respect to illicit drug exchanges, in ways and to an extent not available in offline drug market structures.

“Anonymous” Actors Operating in Online Markets

Whilst some offline illicit drug markets (e.g. open-air street markets, May & Hough, 2004) can retain features of anonymity between the actors involved in the drug exchange, most offline illicit drug market exchanges are performed in socially embedded contexts that cannot be accommodated by rational choice models (Dwyer & Moore, 2010a; Moeller, 2018; Moeller & Sandberg, 2019; Sandberg, 2012). Anonymity, and in-built mechanisms to ensure it, is a key feature of digital spaces for buying and selling drugs. Some online drug markets reflect this to a considerable degree, such as cryptomarkets, that rely on the use of anonymising browsers and encrypted currencies, and though surface net and app-based markets may demonstrate this to a lesser degree, there may still be the utilisation of encrypted communication platforms and

pseudonyms/usernames that serve to reinforce aspects of anonymity within the exchange (Barratt & Aldridge, 2016; Moyle et al., 2019; Phelps & Watt, 2014). Due partly to the increased information on offer to actors involved in cryptomarkets (and to a lesser extent on surface net markets and app-based markets), there is less traditional risk involved in the exchange. Thus, there is less need for exchanges to be performed with a backdrop of long-lasting relationships or prior communication between actors.

Conclusion

There has been a distinct lack of theoretical attention in research on burgeoning online illicit drug markets. We sought to address this lacuna and extend on earlier efforts to conceptualise the theoretical nature of drug exchanges in these new spaces for buying and selling illicit drugs (Aldridge & Askew, 2017; Bakken et al., 2018; Masson & Bancroft, 2018). In offline drug exchanges, although underlying notions of neoclassical theory and *homo economicus* are persistently discredited, rational choice perspectives of exchange still tend to dominate explanations of the drug exchange process. By comprehending drug exchanges as complex assemblages (DeLanda, 2006; Duff, 2016), and considering the affordance capabilities of technologies (Latour, 2002), we have explored how the nature of drug exchange is being reconstructed in different market spheres (offline/online). Key aspects of rationality can potentially contribute to understanding exchange practices in these new markets, where the nature of, and structures facilitating, the exchange have been significantly altered. In this view, rationality is not a foundational essence of the actors involved in the exchange but a capacity that emerges in particular structural contexts. This theoretical exploration was undertaken with a particular focus on the common critiques of rational choice perspectives in offline drug markets and by reflecting on how some aspects of rationality, such as greater subjectivity,

higher degrees of anonymity, and the considerable information available to actors in cost/benefit decision-making, are *afforded* individuals in online environments.

Drug exchange assemblages are reconstructed across different market spheres. Conceptually mapping the differences between illicit drug markets is also fundamental in forming a view of them as differentiated in meaningful ways (e.g. acknowledging variation in supply patterns and the practices of individuals within the market), which is often neglected in drug market research (Coomber, 2010, 2015). Furthermore, examining the structural reconfigurations of drug exchanges in different environments sheds light on the need for theoretical frameworks related to drug market behaviour to be sensitive to the unique exchange assemblages of that market. In a related sense, our article has explored structural differentiation, with reference to the affordance of rationality in the exchange, within different online drug markets. Cryptomarkets, by virtue of their structural resemblance to large centralised markets, may best afford aspects of rationality in understanding the exchange process due to the increased security offered by the platform, and the enhanced ability for buyers and sellers to maximise (or satisfice) utility relative to other illicit drug markets. In other online spaces (i.e. surface net and app-based), however, the affordance capabilities of the technology to promote rationalised forms of exchange are less evident. For example, although cryptomarket exchanges may generally require a degree of planning and preparation, exchange arrangements in app-based drug markets can be the result of more spontaneous decision-making. This is particularly so as the drugs can be accessed at a faster rate in app-based markets due to their greater local reach, and because exchanges may be performed due to other extenuating factors (e.g. alcohol intoxication) (Moyle et al., 2019). As illicit drug markets continue to diversify through the use of online technology, monitoring and analysing the changing nature of drug exchanges is important.

The reality of market exchanges, as has been shown historically, is much more complicated and nuanced than predicted by *a priori* assumptions. The divisions found in conceptualisations of exchange in drug markets is somewhat a reflection of the levels of analysis employed, whereby economic explanations typically focus on market-level analyses, and criminological research on street-level markets often attempts to apply findings from localised contexts to this broader figurative market (Moeller, 2018). As argued by Dwyer and Moore (2010b, p.88), drug market research underpinned by neoclassical assumptions “can describe market-like characteristics, but [it] cannot explain markets or account for people’s actions within them”. Future research on drug-focussed exchanges in online illicit drug markets will potentially benefit methodologically by the different levels of analysis that can be undertaken on the exchange milieu in some digital platforms, which simultaneously allow for a blend of approaches to both market-level characteristics as well as individual action within these markets, thus reducing many of the theoretical and empirical conflicts often found between economics and criminology. Therefore, more research is needed to develop an understanding of how actors interact with the structures provided by online drug markets for buying and selling, the extent to which rational choice frameworks can contribute to an analysis of this behaviour, and how (notwithstanding the fallacy of *homo economicus*) information-rich structures enable greater control over exchange decisions. Online forms of illicit drug markets have the potential to reconstruct the capabilities and meanings of the exchange process, but whether or not this plays out in practice is work for future research.

Arguably, the utilisation of theoretical frameworks to better understand buyer behaviour yields a deeper (albeit abstracted) understanding of the behaviour that occurs within illicit drug markets. Our article described how analyses of the exchange process in illicit drug markets need to occur within an expanded understanding of the structural features and nuances of what have clearly emerged as differentiated market spheres. The market that individuals

interact with is a key component of the complex assemblage that constitutes a drug exchange. Exchange assemblages are reconstructed in digital environments, and online platforms may afford greater elements of rationality to be introduced in the exchange process than offline forms of drug exchange.

Notes

¹ We acknowledge the diverse forms of drug exchange that exist in offline contexts (e.g. open/closed street markets, social supply networks, etc.). For ease of expression throughout the paper, these various forms will be referred to as offline illicit drug markets, except where particular forms of offline drug markets are specified.

² There is growing literature discussing the non-binary conceptualisation of the online/offline divide in relation to crime (Powell, Stratton, & Cameron, 2018), but we use the terms ‘online’ and ‘offline’ drug markets as placeholder terms (see Martin, Munksgaard, Coomber, Demant, & Barratt, 2019).

References

- Akerlof, G.A. (1970). The market for “lemons”: Quality uncertainty and the market mechanism. *The Quarterly Journal of Economics*, 84, 488-500.
- Aldridge, J., & Askew, R. (2017). Delivery dilemmas: How drug cryptomarket users identify and seek to reduce their risk of detection by law enforcement. *International Journal of Drug Policy*, 41, 101-109.
- Alexander, J., & Alexander, P. (1991). What's a fair price? Price-setting and trading partnerships in Javanese markets. *Man*, 26(3), 493-512.
- Ashraf, N., Camerer, C. F., & Loewenstein, G. (2005). Adam Smith, behavioral economist. *Journal of Economic Perspectives*, 19(3), 131-145.

- Bakken, S. A., & Demant, J. J. (2019). Sellers' risk perceptions in public and private social media drug markets. *International Journal of Drug Policy*, 73, 255-262.
doi:10.1016/j.drugpo.2019.03.009
- Bakken, S. A., Moeller, K., & Sandberg, S. (2018). Coordination problems in cryptomarkets: Changes in cooperation, competition and valuation. *European Journal of Criminology*, 15(4), 442-460. doi:10.1177/1477370817749177
- Bancroft, A., & Reid, P. S. (2015). Concepts of illicit drug quality among darknet market users: Purity, embodied experience, craft and chemical knowledge. *International Journal of Drug Policy*, 35, 42-49. doi:10.1016/j.drugpo.2015.11.008
- Barratt, M. J., & Aldridge, J. (2016). Everything you always wanted to know about drug cryptomarkets (but were afraid to ask). *International Journal of Drug Policy*, 35, 1-6.
doi:10.1016/j.drugpo.2016.07.005
- Barratt, M. J., Ferris, J. A., & Winstock, A. R. (2014). Use of Silk Road, the online drug marketplace, in the United Kingdom, Australia and the United States. *Addiction*, 109(5), 774-783. doi:10.1111/add.12470
- Becker, G. S. (1976). Altruism, egoism, and genetic fitness: Economics and sociobiology. *Journal of economic Literature*, 14(3), 817-826.
- Becker, G. S., & Murphy, K. M. (1988). A theory of rational addiction. *Journal of political Economy*, 96(4), 675-700.
- Beckert, J., & Wehinger, F. (2013). In the shadow: Illegal markets and economic sociology. *Socio-Economic Review*, 11(1), 5-30.
- Bentham, J. (1996). *The collected works of Jeremy Bentham: An introduction to the principles of morals and legislation*. Oxford, England: Oxford University Press

- Best, D., Strang, J., Beswick, T., & Gossop, M. (2001). Assessment of a Concentrated, High-Profile Police Operation. No Discernible Impact on Drug Availability, Price or Purity. *British Journal of Criminology*, *41*(4), 738-745.
- Biggart, N. W., & Beamish, T. D. (2003). The Economic Sociology of Conventions: Habit, Custom, Practice, and Routine in Market Order. *Annual review of political science*, *29*(1), 443-464. doi:10.1146/annurev.soc.29.010202.100051
- Bloomfield, B. P., Latham, Y., & Vurdubakis, T. (2010). Bodies, Technologies and Action Possibilities: When is an Affordance? *Sociology*, *44*(3), 415-433.
doi:10.1177/0038038510362469
- Blum, R. H. (1972). *The dream sellers*. San Francisco, CA: Jossey-Bass.
- Bolton, G. E., & Ockenfels, A. (2009). The limits of trust in economic transactions: Investigations of perfect reputation systems. *eTrust: Forming Relationships in the Online World*, 15-36.
- Bushway, S., & Reuter, P. (2008). Economists' contribution to the study of crime and the criminal justice system. *Crime and Justice*, *37*(1), 389-451.
- Caulkins, J. P., Gurga, B., & Little, C. (2009). Economic analysis of drug transaction 'cycles' described by incarcerated UK drug dealers. *Global Crime*, *10*(1-2), 94-112.
- Caulkins, J. P., & Reuter, P. (2006). Illicit drug markets and economic irregularities. *Socio-Economic Planning Sciences*, *40*(1), 1-14.
- Chalmers, J., & Bradford, D. (2013). Methamphetamine Users' Perceptions of Exchanging Drugs for Money: Does Trust Matter? *Journal of Drug Issues*, *43*(3), 256-269.
doi:10.1177/0022042612471652
- Chertoff, M. (2017). A public policy perspective of the Dark Web. *Journal of Cyber Policy*, *2*(1), 26-38. doi:10.1080/23738871.2017.1298643

- Childers, T. L., Carr, C. L., Peck, J., & Carson, S. (2001). Hedonic and utilitarian motivations for online retail shopping behavior. *Journal of Retailing*, 77(4), 511-535.
doi:10.1016/S0022-4359(01)00056-2
- Coomber, R. (2010). Reconceptualising drug markets and drug dealers—the need for change. *Drugs and alcohol today*, 10(1), 10-13.
- Coomber, R. (2015). A tale of two cities: Understanding differences in levels of heroin/crack market-related violence—A two city comparison. *Criminal Justice Review*, 40(1), 7-31.
- Coomber, R., & Moyle, L. (2014). Beyond drug dealing: Developing and extending the concept of ‘social supply’ of illicit drugs to ‘minimally commercial supply’. *Drugs: education, prevention and policy*, 21(2), 157-164.
- Coomber, R., Moyle, L., Belackova, V., Decorte, T., Hakkarainen, P., Hathaway, A., . . . Scott, J. (2018). The burgeoning recognition and accommodation of the social supply of drugs in international criminal justice systems: An eleven-nation comparative overview. *International Journal of Drug Policy*, 58, 93-103.
- Coomber, R., Moyle, L., & South, N. (2016). The normalisation of drug supply: The social supply of drugs as the “other side” of the history of normalisation. *Drugs: education, prevention and policy*, 23(3), 255-263.
- Coomber, R., Pavlidis, A., Santos, G. H., Wilde, M., Schmidt, W., & Redshaw, C. (2014). The supply of steroids and other performance and image enhancing drugs (PIEDs) in one English city: Fakes, counterfeits, supplier trust, common beliefs and access. *Performance Enhancement & Health*, 3, 135-144. doi:10.1016/j.peh.2015.10.004
- Coomber, R., & Turnbull, P. (2007). Arenas of drug transactions: adolescent cannabis transactions in England—social supply. *Journal of Drug Issues*, 37(4), 845-865.

- Coyle, D. (2019). Homo Economicus, AIs, humans and rats: decision-making and economic welfare. *Journal of Economic Methodology*, 26(1), 2-12.
doi:10.1080/1350178X.2018.1527135
- Crawford, D. (2016). Suburban drug dealing: A case study in ambivalent economics. *Research in Economic Anthropology*, 36, 197-219.
- Cunliffe, J., Martin, J., Décary-Héту, D., & Aldridge, J. (2017). An island apart? Risks and prices in the Australian cryptomarket drug trade. *International Journal of Drug Policy*, 50, 64-73. doi:10.1016/j.drugpo.2017.09.005
- Danby, C. (2002). The curse of the modern: A post Keynesian critique of the gift | exchange dichotomy. *Research in Economic Anthropology*, 21, 13-42.
- DeLanda, M. (2006). Deleuzian Social Ontology and Assemblage Theory. In M. Fuglsang & B. M. Sorensen (Eds.), *Deleuze and the Social*. Edinburgh, Scotland: Edinburgh University Press.
- De L'Estoile, B. (2014). Money Is Good, but a Friend Is Better” Uncertainty, Orientation to the Future, and “the Economy. *Current anthropology*, 55(S9), S62-S73.
- Deleuze, G., & Guattari, F. (1987). *A thousand plateaus*. Minneapolis, MN: University of Minnesota Press.
- Demant, J., Bakken, S. A., Oksanen, A., & Gunnlaugsson, H. (2019). Drug dealing on Facebook, Snapchat and Instagram: A qualitative analysis of novel drug markets in the Nordic countries. *Drug and Alcohol Review*, 38(4), 377-385.
doi:10.1111/dar.12932
- Denton, B., & O'Malley, P. (1999). Gender, trust and business: Women drug dealers in the illicit economy. *British Journal of Criminology*, 39(4), 513-530.

- DiMaggio, P., & Louch, H. (1998). Socially embedded consumer transactions: For what kinds of purchases do people most often use networks? *American Sociological Review*, 619-637.
- Doherty, N. F., & Ellis-Chadwick, F. (2010). Internet retailing: the past, the present and the future. *International Journal of Retail & Distribution Management*, 38(11/12), 943-965. doi:10.1108/09590551011086000
- Duff, C. (2016). Assemblages, territories, contexts. *International Journal of Drug Policy*, 33, 15-20. doi:10.1016/j.drugpo.2015.10.003
- Dunlap, E., Johnson, B. D., Kotarba, J. A., & Fackler, J. L. (2010). Macro-level social forces and micro-level consequences: poverty, alternate occupations, and drug dealing. *Journal of ethnicity in substance abuse*, 9(2), 115-127.
- Dwyer, R., & Moore, D. (2010a). Beyond neoclassical economics: Social process, agency and the maintenance of order in an Australian illicit drug marketplace. *International Journal of Drug Policy*, 21(5), 390-398.
- Dwyer, R., & Moore, D. (2010b). Understanding illicit drug markets in Australia: Notes towards a critical reconceptualization. *The British Journal of Criminology*, 50(1), 82-101.
- Eck, J. E. (1995). A general model of the geography of illicit retail marketplaces. In D. Weisburd & J. E. Eck (Eds.), *Crime and place* (Vol. 4, pp. 67-93). Monsey, NY: Criminal Justice Press.
- Elder-Vass, D. (2018). Lifeworld and systems in the digital economy. *European Journal of Social Theory*, 21(2), 227-244. doi:10.1177/1368431017709703
- Emerson, R. M. (1976). Social exchange theory. *Annual Review of Sociology*, 2(1), 335-362.
- Epstein, C. (2013). Theorizing Agency in Hobbes' Wake: The Rational Actor, the Self, or the Speaking Subject? *International Organization*, 67(2), 287-316.

- Etzioni, A. (2011). Behavioral economics: Toward a new paradigm. *American Behavioral Scientist*, 55(8), 1099-1119.
- Evrard, I., Legleye, S., & Cadet-Taïrou, A. (2010). Composition, purity and perceived quality of street cocaine in France. *International Journal of Drug Policy*, 21(5), 399-406. doi:10.1016/j.drugpo.2010.03.004
- Faraj, S., & Azad, B. (2012). The materiality of technology: An affordance perspective. In P. M. Leonardi, B. A. Nardi, & J. Kallinikos (Eds.), *Materiality and organizing: Social interaction in a technological world*. Oxford: Oxford University Press.
- Fraser, S., Treloar, C., Gendera, S., & Rance, J. (2017). 'Affording' new approaches to couples who inject drugs: A novel fitpack design for hepatitis C prevention. *International Journal of Drug Policy*, 50, 19-35. doi:10.1016/j.drugpo.2017.07.001
- Geertz, C. (1978). The bazaar economy: Information and search in peasant marketing. *The American Economic Review*, 68(2), 28-32.
- Gibson, J. J. (1977). The Theory of Affordances. In R. E. Shaw & J. Bransford (Eds.), *Perceiving, Acting, and Knowing*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Gilbert, M., & Dasgupta, N. (2017). Silicon to syringe: Cryptomarkets and disruptive innovation in opioid supply chains. *International Journal of Drug Policy*, 46, 160-167. doi:10.1016/j.drugpo.2017.05.052
- Granovetter, M. (1985). Economic action and social structure: The problem of embeddedness. *American journal of sociology*, 91(3), 481-510.
- Grossman, M. (2005). Individual behaviours and substance use: the role of price. *Advances in Health Economics and Health Services Research*, 16, 15-39.
- Hann, C. (2018). Economic anthropology. *The International Encyclopedia of Anthropology*, 1-16.

- Heath, A., & Heath, L. E. (1976). *Rational choice and social exchange: A critique of exchange theory*. New York, NY: Cambridge University Press.
- Henrich, J., Boyd, R., Bowles, S., Camerer, C., Fehr, E., Gintis, H., & McElreath, R. (2001). In Search of Homo Economicus: Behavioral Experiments in 15 Small-Scale Societies. *The American Economic Review*, *91*(2), 73-78. doi:10.1257/aer.91.2.73
- Hutchby, I. (2001). Technologies, Texts and Affordances. *Sociology*, *35*(2), 441-456. doi:10.1017/S0038038501000219
- Hoffer, L. D. (2016). The Space Between Community and Self-Interest: Conflict and the Experience of Exchange in Heroin Markets. *Research in Economic Anthropology*, *36*, 167-196.
- Hollis, M., & Sugden, R. (1993). Rationality in action. *Mind*, *102*(405), 1-35.
- Hout, M. C. V., & Bingham, T. (2013a). 'Silk Road', the virtual drug marketplace: A single case study of user experiences. *International Journal of Drug Policy*, *24*(5), 385-391. doi:10.1016/j.drugpo.2013.01.005
- Hout, M. C. V., & Bingham, T. (2013b). 'Surfing the Silk Road': A study of users' experiences. *International Journal of Drug Policy*, *24*(6), 524-529. doi:10.1016/j.drugpo.2013.08.011
- Hudik, M. (2019). Two interpretations of the rational choice theory and the relevance of behavioral critique. *Rationality and Society*, *31*(4), 464-489. doi:10.1177/1043463119869007
- Jacobs, B. A. (1996). Crack dealers and restrictive deterrence: Identifying narcs. *Criminology*, *34*(3), 409-431.
- Jacobs, B. A. (1998). Drug dealing and negative reciprocity. *Deviant Behaviour*, *19*(1), 29-49. doi:10.1080/01639625.1998.9968072

- Jacobs, B. A. (1999). Crack to heroin? Drug markets and transition. *British Journal of Criminology*, 39(4), 555-574.
- Jacobs, B. A. (2000). Managing retaliation: Drug robbery and informal sanction threats. *Criminology*, 38(1).
- Jacques, S., Allen, A., & Wright, R. (2014). Drug dealers' rational choices on which customers to rip-off. *International Journal of Drug Policy*, 25(2), 251-256.
- Jacques, S., & Wright, R. (2008). The relevance of peace to studies of drug market violence. *Criminology*, 46(1), 221-254.
- Jacques, S., & Wright, R. (2011). Informal control and illicit drug trade. *Criminology*, 49(3), 729-765.
- Kahneman, D., Wakker, P. P., & Sarin, R. (1997). Back to Bentham? Explorations of experienced utility. *The quarterly journal of economics*, 112(2), 375-406.
- Karacuka, M., & Zaman, A. (2012). The empirical evidence against neoclassical utility theory: a review of the literature. *International Journal of Pluralism and Economics Education*, 3(4), 366-414.
- Khalil, E. L. (2004). What is altruism? *Journal of Economic Psychology*, 25(1), 97-123.
- Koenraadt, R., & Ven, v. d. K. (2018). The Internet and lifestyle drugs: an analysis of demographic characteristics, methods, and motives of online purchasers of illicit lifestyle drugs in the Netherlands. *Drugs: Education, Prevention and Policy*, 25(4), 345-355.
- Kraska, P. B., Bussard, C. R., & Brent, J. J. (2010). Trafficking in Bodily Perfection: Examining the Late-Modern Steroid Marketplace and Its Criminalization. *Justice Quarterly*, 27(2), 159-185. doi:10.1080/07418820902814013

- Ladegaard, I. (2018). We know where you are, what you are doing and we will catch you: Testing deterrence theory in digital drug markets. *British Journal of Criminology*, 58(2), 414-433. doi:10.1093/bjc/azx021
- Latour, B. (2002). Morality and Technology. *Theory, Culture & Society*, 19(5-6), 247-260. doi:10.1177/026327602761899246
- Lavorgna, A. (2015). The online trade in counterfeit pharmaceuticals: New criminal opportunities, trends and challenges. *European Journal of Criminology*, 12(2), 226-241. doi:10.1177/1477370814554722
- Long, D. G. (1990). 'Utility' and the 'Utility Principle': Hume, Smith, Bentham, Mill. *Utilitas*, 2(1), 12-39. doi:10.1017/S095382080000004
- Lovett, F. (2006). Rational choice theory and explanation. *Rationality and Society*, 18(2), 237-272.
- MacCoun, R., & Reuter, P. (1992). Are the wages of sin \$30 an hour? Economic aspects of street-level drug dealing. *Crime & Delinquency*, 38(4), 477-491.
- Malinowski, B. (1922). *Argonauts of the Western Pacific: An Account of Native Enterprise and Adventure in the Archipelagoes of Melanesian New Guinea*. New York, NY: E.P. Dutton & Co.
- Manzo, G. (2013). Is rational choice theory still a rational choice of theory? A response to Opp. *Social Science Information*, 52(3), 361-382.
- Martin, J. (2014a). *Drugs on the Dark Net: How cryptomarkets are transforming the global trade in illicit drugs*. Hampshire, UK: Palgrave Macmillan.
- Martin, J. (2014b). Lost on the Silk Road: Online drug distribution and the 'cryptomarket'. *Criminology & Criminal Justice*, 14(3), 351-367. doi:10.1177/1748895813505234

- Martin, J., Munksgaard, R., Coomber, R., Demant, J., & Barratt, M. J. (2019). Selling Drugs on Darkweb Cryptomarkets: Differentiated Pathways, Risks and Rewards. *The British Journal of Criminology*. doi:10.1093/bjc/azz075
- Martínez-López, F. J., Pla-García, C., Gázquez-Abad, J. C., & Rodríguez-Ardura, I. (2014). Utilitarian motivations in online consumption: Dimensional structure and scales. *Electronic Commerce Research and Applications*, 13(3), 188-204. doi:10.1016/j.elerap.2014.02.002
- Masson, K., & Bancroft, A. (2018). 'Nice people doing shady things': Drugs and the morality of exchange in the darknet cryptomarkets. *International Journal of Drug Policy*, 58, 78-84. doi:10.1016/j.drugpo.2018.05.008
- Mauss, M. (1966). *The Gift: The form and reason for exchange in archaic societies*. London, UK: Routledge and Kegan Paul.
- May, T., & Hough, M. (2004). Drug markets and distribution systems. *Addiction Research & Theory*, 12(6), 549-563.
- McFarlane, C. (2011). The city as assemblage: dwelling and urban space. *Environment and Planning D: Society and Space*, 29(4), 649-671. doi:10.1068/d4710
- Moeller, K. (2018). Drug market criminology: Combining economic and criminological research on illicit drug markets. *International Criminal Justice Review*, 28(3), 191-205.
- Moeller, K., & Sandberg, S. (2019). Putting a price on drugs: An economic sociological study of price formation in illegal drug markets. *Criminology*, 57(2), 289-313.
- Moyle, L., Childs, A., Coomber, R., & Barratt, M. J. (2019). #Drugsforsale: An exploration of the use of social media and encrypted messaging apps to supply and access drugs. *International Journal of Drug Policy*, 63, 101-110. doi:10.1016/j.drugpo.2018.08.005

- Moyle, L., & Coomber, R. (2017). Bourdieu on supply: Utilizing the 'theory of practice' to understand complexity and culpability in heroin and crack cocaine user-dealing. *European Journal of Criminology*, *14*(3), 309-328.
- Moyle, L., & Coomber, R. (2019). Student transitions into drug supply: exploring the university as a 'risk environment'. *Journal of Youth Studies*, *22*(5), 642-657.
doi:10.1080/13676261.2018.1529863
- Ng, I. C. L., & Tseng, L. M. (2008). Learning to be Sociable: The Evolution of Homo Economicus. *American Journal of Economics and Sociology*, *67*(2), 265 - 286.
doi:10.1111/j.1536-7150.2008.00570.x
- Ostrom, E. (2010). Beyond Markets and States: Polycentric Governance of Complex Economic Systems. *The American Economic Review*, *100*(3), 641-672.
- Phelps, A., & Watt, A. (2014). I shop online – recreationally! Internet anonymity and Silk Road enabling drug use in Australia. *Digital Investigation*, *11*(4), 261-272.
doi:10.1016/j.diin.2014.08.001
- Plattner, S. (1983). Economic custom in a competitive marketplace. *American Anthropologist*, *85*(4), 848-858.
- Plott, C. R. (1986). Rational Choice in Experimental Markets. *The Journal of Business*, *59*(4), S301-S327. doi:10.1086/296368
- Pollack, H. A., & Reuter, P. (2014). Does tougher enforcement make drugs more expensive? *Addiction*, *109*(12), 1959-1966.
- Powell, A., Stratton, G., & Cameron, R. (2018). *Digital Criminology: Crime and Justice in Digital Society*. New York, NY: Routledge.
- Reuter, P., & Caulkins, J. P. (2004). Illegal 'lemons': price dispersion in cocaine and heroin markets. *Bulletin on Narcotics*, *56*(1-2), 141-165.

- Reuter, P., & Kleiman, M. A. (1986). Risks and prices: An economic analysis of drug enforcement. *Crime and Justice*, 7, 289-340.
- Ritter, A. (2006). Studying illicit drug markets: Disciplinary contributions. *International Journal of Drug Policy*, 17(6), 453-463.
- Rousseau, D. M., Sitkin, S. B., Burt, R. S., & Camerer, C. (1998). Introduction to Special Topic Forum: Not so Different after All: A Cross-Discipline View of Trust. *The Academy of Management Review*, 23(3), 393-404.
- Sandberg, S. (2012). The importance of culture for cannabis markets: Towards an economic sociology of illegal drug markets. *British Journal of Criminology*, 52(6), 1133-1151.
- Scott, J. (2000). Rational choice theory. *Understanding Contemporary Society: Theories of the Present*, 129, 671-685.
- Simon, H. A. (1955). A behavioral model of rational choice. *The Quarterly Journal of Economics*, 69(1), 99-118.
- Simon, H. A. (1972). Theories of bounded rationality. *Decision and Organization*, 1(1), 161-176.
- Smelser, N. J. (1992). The rational choice perspective: A theoretical assessment. *Rationality and Society*, 4(4), 381-410.
- Smith, A. (1776). *An inquiry into the nature and causes of the wealth of nations*. London, UK: Strahan and Cadell.
- Spiliman, L. (2006). Enriching Exchange: Cultural Dimensions of Markets. *The American Journal of Economics and Sociology*, 58(4), 1047-1071. doi:10.1111/j.1536-7150.1999.tb03407.x
- Stafford, L. (2008). Social exchange theories: Calculating the Rewards and Costs of Personal Relationships. *Engaging Theories in Interpersonal Communication: Multiple Perspectives*, 377-389.

- Strub, P. J., & Priest, T. B. (1976). Two Patterns of Establishing Trust: The Marijuana User. *Sociological Focus*, 9(4), 399-411. doi:10.1080/00380237.1976.10570947
- Taylor, T. L. (2009). The Assemblage of Play. *Games and Culture*, 4(4), 331-339. doi:10.1177/1555412009343576
- Thaler, R. H. (2000). From Homo Economicus to Homo Sapiens. *Journal of Economic Perspectives*, 14(1), 133-141. doi:10.1257/jep.14.1.133
- Thaler, R. H. (2016). Behavioral economics: Past, present, and future. *American Economic Review*, 106(7), 1577-1600.
- Van Buskirk, J., Naicker, S., Roxburgh, A., Bruno, R., & Burns, L. (2016). Who sells what? Country specific differences in substance availability on the Agora cryptomarket. *International Journal of Drug Policy*, 35, 16-23.
- Van de Ven, K., & Koenraadt, R. (2017). Exploring the relationship between online buyers and sellers of image and performance enhancing drugs (IPEDs): Quality issues, trust and self-regulation. *International Journal of Drug Policy*, 50, 48-55.
- Van der Gouwe, D., Brunt, T. M., van Laar, M., & van der Pol, P. (2017). Purity, adulteration and price of drugs bought on-line versus off-line in the Netherlands: On-line and off-line drug quality and price. *Addiction*, 112(4), 640-648. doi:10.1111/add.13720
- Walsh, C. (2011). Drugs, the Internet and Change. *Journal of Psychoactive Drugs*, 43(1), 55-63. doi:10.1080/02791072.2011.566501
- Weatherburn, D., Topp, L., Midford, R., & Allsopp, S. (2000). *Drug Crime Prevention and Mitigation: A Literature Review and Research Agenda*. Sydney, Australia: NSW Bureau of Crime Statistics and Research.
- Wedow, S. (1979). Feeling Paranoid: "The Organization of an Ideology About Drug Abuse". *Urban Life*, 8(1), 72.

Werb, D., Kerr, T., Li, K., Montaner, J., & Wood, E. (2008). Risks surrounding drug trade involvement among street-involved youth. *The American Journal of Drug and Alcohol Abuse*, 34(6), 810-820.

Yamagishi, T., Li, Y., Takagishi, H., Matsumoto, Y., & Kiyonari, T. (2014). In Search of Homo economicus. *Psychological Science*, 25(9), 1699-1711.
doi:10.1177/0956797614538065

Zafirovski, M. (2000). The rational choice generalization of neoclassical economics reconsidered: any theoretical legitimation for economic imperialism? *Sociological Theory*, 18(3), 448-471.

Zafirovski, M. (2014). Rational Choice Requiem: The Decline of an Economic Paradigm and its Implications for Sociology. *The American Sociologist*, 45(4), 432-452.
doi:10.1007/s12108-014-9230-0

Zelizer, V. A. (1988). Beyond the polemics on the market: establishing a theoretical and empirical agenda. *Sociological Forum*, 3(4), 614-634.

Author Biographies

Andrew Childs is a doctoral candidate in the School of Criminology and Criminal Justice at Griffith University. His research focuses on the intersection between technology and illicit drug markets and the nature of trust and risk in these new environments.

Ross Coomber is professor of Criminology and Sociology at the University of Liverpool. He has been researching and publishing on issues around drug use and supply and associated policy responses for over thirty years.

Prof **Melissa Bull** is an interdisciplinary researcher whose research publications have been in the areas of drug and alcohol policy and regulation, sentencing and punishment, community corrections, and policing diversity. She is the Director of the QUT Centre for Justice, Queensland University of Technology, and an adjunct member of the Griffith Criminology Institute.