WILL WE EVER KNOW WHAT IS OUT THERE? – MEASURING COMPLIANCE

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Abstract

One of the main challenges in much empirical study of regulation is to measure the level of compliance with the law. Measuring an individual's or an organization's compliance with the law, however, is always difficult. The two main sets of uncertainty in interpreting and relying on measures of compliance are: Firstly, there is a problem with collecting accurate information about the level of violations of the law committed by a person or an organization. This is a problem because the relevant information has not, and/or cannot, be collected. Secondly, given that "actual compliance" may be impossible to measure directly (because of the first set of problems), the problem is to establish what link, if any there is between "actual compliance" and other measures that we hypothesize are related to actual compliance and that we might be able to use as proxies for actual compliance. This paper critically analyses the strengths and weaknesses of different ways of measuring compliance by reference to the different conceptualizations of compliance in the literature and two sets of data collected by the authors.

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Introduction

Much empirical study of regulation aims to describe, explain or analyze regulatees' compliance with the law. Each of these purposes assumes that, one way or another, researchers can measure compliance. Yet, as this paper shows, measuring compliance with the law is challenging, for two main reasons. Firstly, it is often difficult, if not impossible to collect accurate information about individual or business compliance or non-compliance with the law from any *source*, whether from official records, regulatees themselves, regulators or anything else. Secondly, given that actual compliance is difficult, or impossible, to measure directly (because of the first set of problems), the problem is to establish what link, if any there is between the concept of actual compliance and the various measures that we might hypothesize are indicators of actual compliance – the *operationalization* of compliance.

This paper evaluates the strengths and weaknesses of different ways of measuring regulatory compliance: In the *first* half of the paper we compare measures that differ by *source* of information about compliance. In the *second* half of the paper we consider measures that differ in the way they *operationalize* the concept of compliance. In the nature of the case, however, we do not have an objective standard against which to evaluate the different measures. It would therefore be hubristic to claim that we could ever be confident that we are measuring compliance with complete accuracy. What we can do, however, is to compare the strengths and weaknesses of different indicators of compliance in different contexts with a view to maximizing the reasonableness of the measures we choose for different research purposes.

Researchers can have one, or more, of three main purposes for measuring compliance: to *describe* the level of compliance with the law; to *explain* why people or organizations comply or do not comply with the law; and to *analyze* (or explore*)* different types of compliance or non-compliance.

The researcher's purpose can be *descriptive* - to ascertain the actual level of compliance with the law by a particular population (eg all those regulated under a particular regulatory regime, or in a particular geographical area), or to compare populations. There will often be policy reasons for this, such as to set a benchmark for future improvement in regulatory compliance, to determine how to spend resources on legal compliance education, enforcement or new laws, or so that we can know whether we are likely to be able to trust regulatees in a particular area to comply with the law.

Secondly, the researcher's purpose might be to *explain* what causes regulatory compliance or non-compliance. Much scholarly research in regulatory compliance tests different theories of why people and businesses comply or do not comply with the law - deterrence theory (Scholz 1997), procedural justice theory (Tyler & Huo 2002), reintegrative shaming (Ahmed et al 2001) and so on. At a policy level, we might also have an explanatory purpose - to evaluate whether a particular regulatory strategy has influenced (that is, explains) compliance or not, or, for a business, what internal controls, if any, lead to better compliance, and why.

Finally, there is the endeavour of *analyzing,* or exploring, different types of compliance or non-compliance. Here the researcher starts with the assumption that compliance itself is not necessarily a simple, binary concept – compliance or non-compliance. Rather it is seen as important to differentiate between different types of compliance and non-compliance. For example, an important strand of empirical research on regulatory compliance has sought to capture the fact that individuals might comply with the letter of the law without complying with its spirit, or they might comply with its spirit but genuinely disagree with authorities about what the letter of the law requires. Thus Doreen McBarnet (1994, 2003; McBarnet & Whelan 1999; see also Black 1997, 31-2) has identified the existence of 'creative compliance' (compliance with the letter of the law but not its spirit) as opposed to 'committed compliance', 'capitulative compliance' and 'non-compliance'. (See also Kagan and Scholz 1984 on different types of non-compliance; and V. Braithwaite. 2003; V. Braithwaite et al 1994 on motivational postures towards compliance and non-compliance.)

Analysis of different types of compliance is likely to feed into, and overlap with, the other two purposes for measuring compliance of description and explanation. For example, in their study of compliance with environmental regulation Gunningham, Kagan and Thornton (Gunningham et al 2003; Kagan et al 2003) found a high level of actual compliance with environmental regulation across all businesses (*description* of compliance). But they went on to distinguish between reluctant compliers, committed compliers, environmental strategists, and true believers among the compliers that all complied with environmental regulation (*analyzing* compliance), and then drew some conclusions about what factors influenced these different types of compliance (*explanation* of compliance). Exploration or analysis of different types of compliance might ultimately be aimed at developing more sophisticated measures of, and hypotheses

about what influences, compliance for the purposes of descriptive and explanatory research.

To illustrate and test the different ways of measuring compliance in different contexts, this paper draws on the scholarly literature, and also the compliance measures used in relation to two data sets the authors have collected.

The first data set concerns Australian businesses' compliance with competition and consumer protection law. The data are responses by 999 of Australia's largest businesses (a response rate of 43%) across all industries to a self-completion survey questionnaire concerning their experience of compliance with and enforcement of the *Trade Practices Act* 1974 (Cth) (TPA) (Nielsen & Parker, 2005). The TPA applies to all Australian businesses and prohibits certain anti-competitive conduct (eg price-fixing, abuse of market power), unfair trading practices (especially misleading and deceptive advertising), non-compliance with legislated product safety standards, and unconscionable conduct in dealings between businesses and consumers or business to business. The Australian Competition and Consumer Commission (ACCC) is the enforcement agency for the TPA with powers to investigate potential contraventions and take alleged offenders to court for the imposition of monetary penalties, injunctions and other orders. The ACCC has no powers of its own to fine or penalize businesses.

The second data set concerns the regulation of 174 Danish businesses across four different regulatory areas: municipal enforcement of environmental regulation, county enforcement of environmental regulation, national regulation of occupational health and safety, and municipal enforcement of fire precaution regulation (Nielsen, 2002; 2005; 2006; forthcoming). The data were gathered primarily through studies of agency files.[1] Other data were gathered through a questionnaire to the inspectors of the 174 businesses. During the reviews of the files, information about breaches committed, and the inspector's reaction to those breaches was recorded. The questionnaires provide data on a more intangible phenomena – namely, the inspectors' subjective evaluation of each company's standard of compliance.

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[1] To make sure that data are consistent between businesses and between regulatory areas, all file reviews were done by the same person, Nielsen, guided by a registration form.

Compliance Measure Sources

The main sources of information on regulatory compliance used by researchers are: (1) official records, (2) regulatees, (3) regulatory officials, (4) the victims of non-compliance, (5) professional advisers, (6) observation by the researcher, and (7) laboratory experiments. Most researchers rely either on qualitative data from a small number of case-studies based on in-depth interviews with regulators and regulatees (eg Braithwaite, 1985; Braithwaite, 1984; Gunningham et al., 2004; Haines, 1997; Rees, 1988; Rees, 1994), or mixing quantitative data from pre-existing official or commercial data sources and regulatory agency records of officially recorded violations of the law (eg Baucus & Near, 1991; Dalton & Kesner, 1988; McCaffrey & Hart, 1998, Mendeloff & Gray, 2005; Potoski & Prakash, 2005; Simpson, 1986). A few studies triangulate sources of information, for example self-reported levels of compliance plus the regulatory inspection team's assessment of compliance (Braithwaite & Makkai, 1991), or official records plus surveys of regulatees (Scholz & Pinney, 1995; May & Winter, 1999, Nielsen, 2002). But triangulating data sources is costly, and may also leave researchers with the question of which data source to trust if there is no correspondence between data from two or more sources. This is a question that can only be answered by looking closely at the quality, and potential risks of, data from each source.

As we show below, each source of compliance information has strengths and weaknesses depending on the context in which it is collected and the purpose of the research. Table 1 summarizes these strengths and weaknesses.

Table 1: Sources of Compliance Information: Strengths and Weaknesses

Source	Strengths	Weaknesses
Official Records	Accessible Inexpensive Often longitudinal	Very often under-inclusive Sometimes over-inclusive
Regulatees	First hand knowledge of own compliance	Social desirability bias Might have poor memory/ knowledge of law, or own behavior.
Regulatory Inspectors	Information about less tangible elements of compliance Can compare regulatees	Inaccurate
Victims	First hand knowledge	Problems reliably relating answers to non-

	From a different perspective than regulatee or regulator	compliance by particular regulates Access problems with asking employees/customers of regulatees
Professional Advisers	Can compare regulatees	Ethical limits on access
Observation	Exact information collected controlled by the researcher High level of internal reliability	Researcher's presence affects regulatees' behavior Ethical problems if secret observation Often requires highly specialized knowledge Difficulty of access Tinme-consuming
Experiments	Independent variables controlled by researcher For quasi-experiments: Researcher can define compliance/non-compliance	For real experiments: Political, ethical and practical limitations For quasi-experiments: Measures behavioral tendencies/mechanisms only Social desirability bias

Many studies seek an objective, external measure of compliance by using *officially recorded data* obtained from regulatory enforcement agencies, such as records of the results of compliance monitoring and inspection visits (Gray & Scholz, 1991; Gray & Scholz, 1993), and publicly available records of enforcement action (notices, fines, litigation) (Harrison, 1995; Brown, 1994).

However these records are very often under-inclusive since many violations are not officially discovered, nor recorded. This is especially true of the records of 'reactive' regulators. The ACCC (from our Australian data set) is an example of a 'reactive' regulator: Its enforcement activity is primarily single case-based; it only investigates potential breaches when complaints are made to it, rather than engaging in systematic, proactive monitoring and inspection to seek out breaches; and only investigates a small minority of the complaints that are made to it. Reactive regulators' records will be under-inclusive *if* they do not receive complaints about every breach, or do not investigate every complaint. On the other hand, a reactive regulator whose official records are not likely to be under-inclusive is, for example, the police murder squad because most murders are reported, and all murders reported are investigated (although the murderer may not be identified in every case!).

The regulators in the Danish data set were all examples of proactive regulators. The inspector and the regulatee meet face-to-face on an ongoing basis. But even proactive regulators do not discover and record all offences. Many violations come and go, without being discovered, during the long intervals between inspections in most regulatory areas. Nor are all violations existing at the time of an inspection discovered; and of those that are detected, not all are recorded because of inattention, inspectors' discretion to be lenient, or even, in some cases, corruption.

Equally, however, official records, whether from reactive or proactive regulators, can be over-inclusive. Agency records may be based on the agency's opinion that a breach has occurred where in fact no breach has occurred or, where alternative interpretations are possible and there has been no authoritative determination on the matter. For example, in the majority of cases the ACCC 'settles' enforcement action with agreed sanctions rather than prosecuting businesses in court. We know that some of these businesses later deny that they have actually breached the law (Parker, 2006). Since it is only the court who can authoritatively determine whether certain facts amount to a breach of the TPA or not, we cannot judge whether settled cases that are included in agency records are actually cases of violations or not.

The strengths of officially recorded data include that they are, mostly, easy to access, and free of charge. Furthermore, they are usually collected over many years - which is especially useful where researchers want to explain changes in compliance. However agency records are of limited use where the purpose is to describe or evaluate the implementation and enforcement of the law, since the compliance data itself will be affected by the weaknesses of the regulatory agency's own performance. In these cases, other sources will be required to check or complement agency generated records.

An alternative to using officially recorded data is to ask the *regulated individuals or businesses* studied to report their own behaviour to the researcher in in-depth interviews or via survey questionnaires (Edwards, 1991; May, 2003; May & Burby, 1996; Wenzel, 2003; Thornton, Gunningham & Kagan, 2003; DeHart-Davis & Bozeman, 1999; Winter & May, 2001; May & Wood, 2001). These data have the advantage that generally the respondents themselves are likely to know more about their own history of compliance with the law, than enforcement officials do. But it is also possible that respondents will have forgotten, or, even, not be sufficiently aware of the law to know about their own violations. Furthermore, if the regulatees are organizations, especially large

organizations, the individual respondent may not know enough about what goes on inside the organization to report accurately on organizational compliance. In addition, respondents might show a social desirability bias that makes it difficult for them to admit to themselves, let alone in an interview or questionnaire, that they or their organization have breached the law, particularly if the violation has not yet been officially discovered.

Asking regulatees about their own compliance will be most useful where the research purpose is to understand how they view compliance and different types of compliance. It may also provide a useful alternative or supplement to official data in descriptive or explanatory research, but only where the researcher can overcome the social desirability bias. This can be done by using anonymous, confidential questionnaires, by asking questions abut specific behaviours (rather than just asking whether they have or have not breached the law), by asking the same question in different ways (so that answers can be cross-checked), perhaps even using 'trick' questions, and, possibly, validating the reliability of responses against other sources.

A third alternative is to ask individual *regulatory inspectors* to report the level of compliance of regulatees (Makkai & Braithwaite, 1993, Braithwaite et al, 1994, May & Winter, 1999). However, most inspectors do not know each regulatee that well. Indeed inspectors with reactive regulatory agencies will not know of a regulatee at all unless there has been a complaint. The inspector might also have a poorer memory than written archives (especially if they are asked some time after an inspection). Furthermore, since inspectors change jobs, the inspectors available at a particular agency at any one point in time will not necessarily carry sufficient 'institutional knowledge' to answer the researcher's questions.

The strength, however, of asking regulatory inspectors (and also regulatees themselves) in comparison with official records is that inspectors are able to provide information on less tangible, subjective elements of compliance such as the company's overall standard of compliance, and its 'will to improve' (see below). This can be a useful way of exploring and understanding different types of compliance. Moreover inspectors will have knowledge about a broad range of regulatees, and can therefore evaluate individual regulatees' relative compliance. If they have sufficient memory of particular regulatees, they can also provide a useful check on the regulatees' own assessment of their compliance (for the purpose of descriptive studies) and their level of compliance (for explanatory studies).

Fourth, some studies measure compliance by asking the potential 'victims' of non-compliance to report how often they have experienced non-compliance. For example employees might be asked how often they have experienced workplace harassment or unreported occupational injuries (Mayhew et al 1997). Consumers might be asked how often they have experienced food poisoning or purchased faulty products. This is likely to be useful information for describing general levels of compliance in a particular industry or geographical area. However where a general survey is undertaken there might be problems with connecting information from victims to particular regulatees for the purposes of explanatory research. The respondents might not remember which store sold them the mouldy loaf of bread. If we choose to go to employees or customers of a particular business, then we will have the same access problems as with asking the regulatee themselves.

Some studies measure compliance by asking *professional advisers* (such as lawyers or engineers) working in the regulatory field to rate the level of compliance of their clientele (Beckenstein & Gabel, 1983). The strengths of asking professionals are similar to those of asking regulatory inspectors. Professional advisers are likely to maintain a general knowledge of the level of compliance and compliance behavior of a range of businesses, and therefore are able to evaluate regulatees' compliance relative to one another. In contrast to regulatory inspectors, professional advisers also often have intimate knowledge of several regulatees' compliance history and practices. It might however create ethical problems to ask counselors and advisers to report on individual named regulatees, since they usually owe onerous obligations of confidentiality to their clients. Therefore, they will mainly be a source of information on the behavior and attitudes of groups of anonymous regulatees, rather than potentially identifiable individual clients.

A fifth source of information is *direct observation* of compliance or non-compliance by the researcher him- or herself (Wilson & Braithwaite, 1978). The strengths of observation are obvious - the researcher is able to get the exact information he or she needs, whatever their purpose. The researcher is not dependent on what has been officially recorded, or a respondent's filtering of information. Furthermore, observation done by one observer increases the internal reliability of the data compared to other kinds of data collection, since the identification of compliance and non-compliant behavior has been done in line with only one evaluation standard - namely the observer's. Direct observation of non-compliant behaviour is frequently used in revelatory journalism and by consumer groups

and consumer magazines. For example, the Danish TV program "Kontant"[2] has used hidden cameras to reveal illegal and unethical sales methods among insurance agents and investment companies.

Observation is rarely used in academic compliance research because of problems of time, access, costliness and the expertise required for collecting sufficient data by this method for analysis. In many regulatory areas accurate detection and identification of legally compliant and non-compliant behavior requires highly specialized knowledge and, even specialist technology. It might be easy to identify whether or not people break the law by crossing the road while the traffic lights are red, and it is for example equally easy to check whether children's flannelette pyjamas being sold all contain the required warning that they are flammable and should not be worn close to heaters or open fires. It is however more difficult for laypeople (as most regulatory researchers are in the different areas of regulation) to detect whether or not a company is violating building code, or environmental, health and safety, and fire precautions laws. One solution might be for the researcher to hire an independent 'rater' with specialized knowledge to judge regulatees' behavior (see Braithwaite et al, 1992; Braithwaite & Braithwaite, 1995.)

Another, classic, weakness with observation is that knowledge of the observer's presence is very likely to change the regulatee's behavior. Only a small proportion of people cross while the traffic lights are red when there is a policeman standing next to them, and no auto mechanic pours waste oil into the drain while a researcher is watching. The obvious solution to this problem is to keep the purpose and identity of the researcher secret. This however leads to serious ethical problems, and in some countries the researcher will not even be allowed to conduct research in this way. Even if one is allowed to go out and do secret fieldwork observation, this kind of data collection is costly as it often requires many hours to observe sufficient violations for analysis. Furthermore, the researcher/observer might not have sufficient access to observe relevant behavior. That is especially likely to be a problem with large organizations, but can be a problem with any regulatees, organizational or individual, if their non-compliance is in private rather than public space. (See Rodger (2005) for an account of the difficulties, and ultimate failure, of a researcher in gaining access to observe companies' competition law compliance.)

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[2] The Danish word 'Kontant' means both 'cash' and a firm and direct way of behaving.

Another issue with observation, particularly participant observation is that wherever we are seeking to observe anything complicated, one of the ways we do it is to find informants to explain what is happening to us and to tell us whether things we observe are typical or not. Then our research method shades back into asking the regulatee, asking inspectors or asking professional advisers etc (Tombs 1992).

Finally, a few studies gather information on compliance – or rather tendency to comply or not comply – on the basis of *experiments.* For example, prior to filing the 1987 tax return (the first year affected by a new tax reform act), McGraw and Scholz (1991) asked taxpayers to view one of two videotapes, one emphasizing the social consequences of the reform and normative duties, the other emphasizing the personal consequences of the reform and strategies to reduce tax liability. A control group did not get any information about the tax reform. The great advantage of well-designed experiments is that the researcher can completely control the relevant factors applied to the respondents. This is ideal for explaining compliance, since the researcher can manipulate a variety of independent variables that are thought to influence the behavior of regulatees. However, real world compliance experiments are not a frequently used method because of problems with persuading regulators and government to use experimental design in applying different enforcement and educational activities to regulatees. For example, randomly assigning large number of businesses to a more lenient, cooperative inspection regime while a similar number are assigned to a stricter, punitive regime for experimental and statistical purposes raises obvious political and ethical problems.

Some researchers, however, have used 'quasi-experiments' in which regulatees are asked to report their most likely behavioural responses to different outlined scenarios in a written questionnaire, interview or role play (e.g. Simpson, 2002; Evans & Palermo, 2002). In quasi-experiments the researcher can control the information given to each respondent about the scenario, making it easy to manipulate and test variables that might explain compliance. But the reported behaviour may not necessarily equate with what the respondent would actually do in real life. It is more likely to elicit an idealistic or politically correct answer, than an accurate prediction. Problems with validity are therefore a weakness of this type of question.

Another strength with quasi-experiments might be that, as with Evans and Palermo's study (2002), the researcher is able to ask the respondent what values, attitudes and other considerations are motivating them to respond the way they do. This might be useful for

understanding variation in motivation and causes of compliance in terms of more fundamental theories of how preferences are formed – but it is not necessarily useful for predicting what respondents will do in real life. Moreover of course we cannot use experimental methods to describe actual levels of compliance with an existing regime since they only tells us about respondents' behavior in staged or hypothetical situations and therefore only their tendency to comply or not comply, not their actual compliance.

Operationalizing Compliance

The *source* of information on compliance is one question. The substance of what is asked – how the researcher defines and operationalizes the concept of compliance – is another question. In terms of substance, we can differentiate between measures that seek to *directly* measure compliance - number of violations or ratings of 'compliance'- and, those that might more *indirectly* indicate the level of compliance such as attitudes, behaviors or organizational practices. Table 2 summarizes the strengths and weaknesses of various direct and indirect ways of operationalizing compliance for measurement.

Table 2: Different Ways of Operationalizing Compliance: Strengths and Weaknesses

Ways to Operationalize 'Compliance'	Strengths	Weaknesses
Number of Breaches	As close as possible to an objective measure	Measures past behavior Different interpretations of breach of rules
Rating of Level of Compliance	Looks to potential, future behavior	Subjective Might be influenced by factors other than compliant/non-compliant behavior
Specific behavioral or organizational elements	The researcher defines what is a proxy for compliant and non-compliant behavior	Perhaps does not have any, or only weak, correlation with the phenomenon for which it is claimed to be a proxy.
Attitudes	The researcher defines what is a proxy for compliant and non-compliant behavior	Proxy (as above)
Capability and skills	The researcher defines what is a proxy for compliant and non-compliant behavior	Proxy (as above)
Willingness	Fairly easy for the respondent to respond to	Subjective. Proxy (as above)

Culture of compliance		Very subjective
		Proxy (as above)

Direct Measures

Probably the most common way to conceptualize and measure compliance, at least in quantitative studies, is by counting the *number of breaches* of the relevant rules. Since this measures behavior (breaches) that took place in the past, if the researcher's purpose is explanatory - to test different theories of what influences regulatees' compliance - they must be careful to collect information about the potential explanatory (independent) variables from a time *before* the breach took place. Attitudes or behaviors today cannot explain a high or low level of breaches committed last year. They might even be a consequence of the breach, and any following interaction with a regulatory agency, as our Australian data demonstrates (see discussion of Table 5 below).

A more fundamental problem with using number of breaches as the measure of compliance is whether it is possible to objectively and consistently define what amounts to a breach at all. In some cases it might be relatively straightforward to say whether certain facts amount to compliance with the law or not. But in other cases, the decision about what is compliance will be more difficult since rules are inherently indeterminate (Black 1997, 10). We have already seen that with our Australian data there can be differences of opinion between the ACCC and businesses about what amounts to compliance. How then will the researcher define non-compliance? Will they take a view on matters of technical legal interpretation and application? Or will they leave it up to respondents or official records to define compliance?

Depending on the source of information chosen, the researcher will have more or less control over defining what amounts to a breach. With official regulatory agency records, for example, the data have already been collected according to the agency's definition of what amounts to a breach, and the researcher has little possibility of changing that. The same would apply where a researcher simply asks regulatees (or inspectors, advisers etc) how often regulatees have 'breached' the law. The interpretation of breach is left up to the respondent. On the other hand, in questionnaires or in-depth interviews, the researcher can ask for specific facts about the regulatees' behavior and then make their own decision as to whether those facts amount to a breach or not. Observation and experimentation, of course, allow researchers even more control over how they define

what amounts to a breach. But the more control the researcher has, the more time-consuming and costly the research usually becomes, and also the more difficult to access reliable, honest information.

Where the purpose is description - especially where it is to evaluate the level of compliance accomplished by a law or regulatory agency - then it will often be important for the researcher to define for themselves what breach and compliance means on the facts and to collect that information for themselves, rather than relying on the way regulatees or official records define compliance. Similarly where the researcher's purpose is to explore and understand different types of compliance, then different understandings and interpretations of the facts and what amounts to compliance are, by definition, an important part of the research. Therefore researchers must inquire into what amounts to compliance and not simply accept the definitions of others. However, where the purpose of the research is explanation, it might be less important for the researcher to control the definition of compliance used in their measure as long as the measure is consistent, and we know what assumptions or interpretations lie behind it. Since the main point of the research is to study what changes the level of compliance, the important thing is that the measure of compliance is consistent. But it is not necessarily important that the researcher actually control the definition of compliance used in the measure, as long as they know what understandings of compliance are reflected in the measure so that they know what they are explaining.

Instead of focusing on trying to measure individual breaches of the rules, researchers could frame the question more positively and broadly by asking respondents to rank regulatees' *level of compliance* on a scale. This measure recognizes that respondents can have a general sense of regulatees' level of compliance without knowing exactly how many breaches of particular rules have occurred. It is particularly useful where the researcher is interested in compliance or non-compliance with a whole regulatory regime not just particular rules. More significantly, with this measure the researcher avoids the problem of the indeterminacy and artificiality of deciding what amounts to a breach of the letter of the law, by allowing the measure of compliance to encompass the respondents' assessment of regulatees' compliance with the spirit of the law as well as the letter. For at least some purposes this is a better way to conceptualize compliance generally (Parker 2002, 22-27). Indeed many regulatory inspectors themselves define compliance in this way:

Planning is as important as building, intention as important as action. Assessments of conformity thus tend to be fluid and abstract, rather than concrete and unproblematic. "Attitudes" are judged [by enforcement agents] as much as activities. (Hawkins 1984, 109).

But ratings of compliance using this type of measure might not correlate with whether or not regulatees breach the letter of the law at all. For example, Tables 3 and 4 show that in neither our Australian nor Danish data is there any correlation at all between either the regulatory inspector's or the regulatee's own evaluation of level of 'compliance' on the one hand, and the fact that the regulatee has breached the law (or been under suspicion of doing so) on the other hand.

Table 3: Correlation between Danish Inspector's Evaluations of Individual Businesses' Level of Compliance and the Businesses' Annual Average Number and Gravity of Breaches

	Average Number of Breaches	Average Gravity of Breaches
Inspectors' Evaluation of Level of Compliance	-.110	.016

Pearson correlation. ** = p< 0.01 (two-tailed). The measure of compliance is an average of evaluations for each year in a 7 year time period.[3]

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[3] The question to inspectors was: 'How would you rate the compliance level of XX (the name of the regulatee) in year xx on a scale going from 0 to 10?'

Table 4: Correlation between Australian Businesses' Self-estimated Level of Compliance and Whether they have had an ACCC Breach Investigation - Self-Reported or According to ACCC Annual Reports, ACCC Investigation Leading to Finding of Breach (Self-Reported) and Whether they Admitted Breaching the TPA.

	ACCC Investigation of Potential Breach (ACCC Annual Reports)	ACCC Investigation of Potential Breach (self-reported)	Investigation Leading to Finding of Breach (self-reported)	Admit Breach of TPA (regardless of having been investigated)
Self-Rated Compliance	-.012	.015	-.053	-.008

Pearson correlation. ** = p< 0.01 (two-tailed). The measure of compliance is an average of ratings for each year in a 6 year time period, except last column as this question did not require information about when the breach occurred.[4] For each of variables across top row, no = 0, and yes = 1.

Measuring compliance by asking the respondents to rank the regulatee's 'level of compliance' is a very subjective measure of compliance – it leaves a lot of interpretation to the respondent rather than the researcher. How the respondent defines compliance might even vary from respondent to respondent. So what the researcher wins in conceptual broadness they might lose in consistency and reliability. However, an argument for using evaluation of level of 'compliance' as a measurement of compliance is that it focuses on present and future behavior more than do measures of number of breaches, and therefore may be more useful in studies with an explanatory purpose than measures of past breaches are.

However a final problem with this measure, especially for research that seeks to test explanations for compliance, is that respondents may incorporate their assessment of regulatees' attitudes and intentions into their assessment of their level of compliance. In other words respondents will incorporate more indirect measures – of attitudes and intentions that respondents believe will lead to greater compliance – into what appears to be a direct measure of compliance. As we argue below, it will usually be better to keep attitudes and intentions conceptually separate from breaches for explanatory research. Such mixes might be appropriate in descriptive or analytical research as long as it is clear what are the different concepts of compliance being measured. Even so, it might be

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[4] The question on compliance was: 'Now we want you to estimate the actual level of compliance of your organisation with the Trade Practices Act. Please mark your evaluation for each year on the scale from 0 to 100. You should mark 0 if you believe that the actual level of compliance with the Trade practices Act is very low. Mark 100 if you believe that your actual compliance is very high.'

preferable for the researcher to control the extent to which attitudes and intentions are mixed in with behaviors in measuring compliance, rather than leaving it up to respondents.

Indirect Measures

One way of trying to overcome the difficulties of measuring compliance accurately, consistently and objectively is to focus instead on measuring things that we can establish more accurately and reliably and that we believe to be closely associated with compliance - such as attitudes, behaviors or organizational practices related to compliance. Some researchers might be interested in describing the distribution of these phenomena for their own sake. But others may seek to use them as proxies for, or *indirect* measures of, compliance in explanatory or descriptive studies.

The weakness with using these measures as proxies for compliance is that we cannot be sure that the assumed connection to the phenomenon of interest – namely actual compliance – exists. Indeed when researchers measure compliance indirectly through proxies, they implicitly or explicitly propose a model of causality saying that if a regulatee scores high on, for example, positive attitudes towards compliance, the regulatee will also score high on actual compliance. In effect the researcher adds an extra link to their conceptual model as shown in Figure One.

Our Australian data included a number of measures that might be used as proxies for business compliance with the TPA that we can use to illustrate this approach and its weaknesses:

Number of compliance employees: defined as 'full-time employees the business spent ensuring compliance with the TPA last year'.

Implementation of internal management system elements for ensuring compliance with the TPA: the respondent was to answer 'yes' or 'no' to a series of questions that were later grouped into four different indices measuring the implementation of system elements concerning a) complaints handling, b) communication and training, c) management accountability and whistleblowing, and d) compliance performance measurement and discipline (Nielsen & Parker 2005, 30-34; Parker & Nielsen, 2006a).

Compliance management in practice: an index made up of responses (strongly agree to strongly disagree) to a long list of concrete statements about the compliance practices of the organization including 'Compliance failures are always investigated to understand their cause' and 'In my organization we review our compliance program on a regular basis'.

Attitudes towards the goals of the TPA: two indices made up of businesses' responses (strongly agree to strongly disagree) to different statements about the goals of the TPA concerning a) consumer protection, fair trade and unconscionable conduct and b) anticompetitive conduct.

Table 5 shows the correlation between these measures and the more direct measures of compliance previously shown in Table 4.

Table 5: Correlation between Direct Measures of Australian Businesses Compliance (shown in Table 4) and Different Potential Proxies (Indirect Measures) of Compliance.

	Number of Compliance Employees	Attitudes Towards Goals of the TPA (negative – positive)		Compliance Management in Practice	Implementation of Compliance System Elements			
		Consumer Protection etc	Anti-competitive Conduct		Complaints Handling	Communication & Training	Management Accountability & Whistleblowing	Compliance Performance Measurement & Discipline
Self-Rated Compliance (low - high)	.071*	.003	.062	.329**	.227**	.197**	.150**	.226**
ACCC Investigation of Potential Breach (reported by ACCC) (no = 0, and yes = 1)	.118**	.-018	.032	.340**	.123**	.323*'	.251**	.210**
ACCC Investigation of Potential Breach (self-reported) (no = 0, and yes = 1)	.170**	-.043	.040	.212**	.171**	.392**	.268**	.254**
Admitted Breach of TPA (no = 0, and yes = 1)	.168**	-.032	.049	.104**	.144**	.327**	.234**	.268**

Pearson correlation. ** = p< 0.01 (two-tailed). a) The measure of actual compliance is an average of evaluations for each year in a 6 year time period.

At first it seems surprising that in Table 5 the more direct measures of compliance correlate *positively* with most of the indirect proxies. If a business for instance *admits having breached* the law, the business has also a high number of compliance employees, a high level of compliance management in practice and has to a high degree implemented

compliance system elements. The only one of the four direct measures of compliance that correlates with the indirect measures in the expected way is the businesses' 'self-estimated level of compliance' - when this is estimated as high, the scores on the different indirect proxies are also high.

The results in Table 5 illustrate an important point, and problem, with measuring compliance in explanatory research - the importance of getting the time order correct. The most plausible explanation for the results in Table 5 is that the breaches reported by the regulatees themselves and recorded in the ACCC's Annual Reports were committed prior to the time at which the reported organizational practices and attitudes became current. Thus, as between those data, the causality is actually the other way around to what we might at first assume: breaching the law, especially if one is caught, leads to hiring more compliance professionals, the implementation of better compliance systems, and to better compliance management in practice. No matter how interesting this is, it still does not tell us whether or not, and to what degree, the different indirect measures lead to a higher level of compliance. This remains a research question in itself (Parker & Nielsen, 2006b).

The results in Table 5 also highlight the danger of using what we believe, but do not know, to be proxies for explaining compliance as dependent variables. Many proxies are likely to only contribute partly to legal compliance, and some only in a complex combination with other proxies. For example, there is no significant correlation between 'right attitudes' and compliance in Table 5 – right attitudes might only lead to compliance, where they are backed up with the right skills and capabilities. It is therefore dangerous to cut short the explanatory model and only use indirect measures as dependent variables. One must test the causality, and strength of causality, between the proxies outlined above and the actual level of compliance, by either relying on different methods of ranking the regulatee's actual level of compliance - by asking the regulatee, the regulator, professional counselors and advisers, or through observation - or one must collect data on capabilities and skills, attitudes, practices and the implementation of compliance system elements at one point in time and then later collect data on the actual number of breaches committed in the meantime.

There might however, be other reasons to want to know about indirect measures than to use them as dependent variables in explanatory research. For example, if we think there are likely to be differences between how the courts or the regulators on the one hand and

the businesses on the other interpret and apply legal compliance in specific situations, it might be very useful to know whether the regulatee had an attitude that favored compliance in general, even though they actually technically breached the law according to inspectors or official records.

Other proxies used in the literature are 'willingness to comply' and 'culture of compliance'. These two measures are more subjective than the proxies mentioned above. The scores are based on a 'sense' of how things are, and not on whether or not different things actually occur. However, the strength of asking about something like 'willingness to comply' is that it is a concept that most respondents – not only the regulatee, but especially the regulator and the professional advisers - have a fairly good sense of.

In the Danish data the regulatory inspectors were asked to rank the 'willingness to comply' of each of the regulatees. In the questionnaire to the Australian businesses, we asked the businesses to rate their overall *culture of compliance* - on a scale from 0 to 100. By culture of compliance we explicitly wrote that we meant attitudes and systems that support compliance with the TPA. How well these measures correlate with the more direct measures of compliance is shown in Tables 6 and 7.

Table 6: Correlation between Danish Inspectors' Evaluations of Individual Businesses' Willingness to Comply and their Average Annual Number, and Gravity, of Breaches

	Average Annual Number of Breaches	Average Gravity of Breaches
Inspectors' Evaluation of Willingness to Comply	-.106	.091

Pearson correlation. ** = p< 0.01 (two-tailed).

Table 6 shows that the measure of willingness to comply does not correlate with the degree to which the regulatee has actually breached the law. There might be two reasons for this: First, there is the problem of differences in time – the regulatory inspectors evaluate the businesses' willingness to comply as they see it today, not in the past when the breaches occurred. Furthermore, the inspectors' evaluation of willingness to comply is influenced by things other than the fact the regulatee has breached the law or not.

Table 7: Correlation between Australian Businesses' Self-estimated Level of Compliance, ACCC Investigation - Self-Reported or according to ACCC Reports, and Self-Reported Breach; and Self-Rated Level of Culture of Compliance.

	Self-Rated Culture of Compliance (low to high)
Self-Rated Actual Compliance (low to high)	.615**
ACCC Investigation of Potential Breach (ACCC Annual Reports) (no = 0, and yes = 1)	.051
ACCC Investigation of Potential Breach (Self-Reported) (no = 0, and yes = 1)	.093**
Admitted Breach(no = 0, and yes = 1)	.008

Pearson's correlation, ** = p< 0.01 (two-tailed).

Table 7 shows that by using 'culture of compliance' as a proxy for level of compliance we run into the same problem with causality as we did with the other indirect measures discussed above. Furthermore, when it comes to 'admitted breach' and 'investigation according to ACCC', the correlation is not even significant. This indicates that there is no causality at all between 'culture of compliance' and having breached the law – not even the other way around. On the other hand, the significant correlation between 'culture of compliance' and 'self-estimated actual level of compliance' is not a surprise since both are self-reported and subjective measures.

Conclusion

We have discussed many strengths and weaknesses of the different sources of data on compliance, and different ways of operationalizing the concept of compliance. Are we now so worried that it makes us incapable of making a decision and designing an empirical study on compliance? Or are we able to give some tentative guidelines that might not solve, but at least minimize the problems? Our analysis suggests that two things are very important in designing empirical studies that seek to measure compliance.

Firstly, it is important to be clear about what the purpose of the study is – is it descriptive, explanatory or analytical (exploratory)? Or will the same variables be used for a variety of purposes? It is also important that the researcher always keep in mind which link in the theoretical chain of compliance he or she is measuring when drawing conclusions. Is it the direct level of compliance, indirect proxies for compliance (variables that might influence compliance), or even some outcome that we might expect to follow from compliance (eg less pollution, consumer confidence in a fair market place)? (See Figure 1.)

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Secondly, having established the purpose of the study, the researcher must be clear about what definition or conceptualization of compliance they are using, and to what extent it is important for the researcher to control the definition of compliance or whether the conceptualization of compliance used in official records or as interpreted by respondents is sufficient. This will help decide which sources of information can be used, as well as what questions to ask.

Below we draw some specific conclusions about how we might think about measuring compliance in relation to each of the three main purposes of compliance research:

In relation to *descriptive* research, we have shown that accurately ascertaining levels of compliance or violations will often be close to impossible – because of problems with gaining accurate material from different sources, and also the problem of interpreting what amounts to compliance in the first place. The extent to which this is a problem will depend partly on the nature of the rules in the regulatory regime we are studying – how open to disputation and differing interpretations are they? Use of different sources of information might affect how we see the substance of compliance in the sense that we might unwittingly import into our measures either a regulator or regulatee view, for example, of how to interpret the compliance requirements of the law in different circumstances. The more subjective measures will leave us more open to this occurring without us even knowing what interpretation has been applied. In descriptive research therefore researchers should be particularly be aware of the possibility of different points of view, and seek to collect information using variables that are seen as fair and reliable. In particular, where our purpose is to evaluate one party (whether regulatory agency or regulatees), then it is important to also gain views and interpretation on level of compliance from sources outside their own control.

In descriptive research it is also important that there is no systematic bias in the data collected. If for instance small companies are underrepresented in the data it weakens conclusions about differences between companies according to size. A statistical solution to such a problem might be to weight the groups of respondents differently, but it should still be the ambition to make sure that the data is not biased. On the other hand, where the purpose is purely descriptive and we are not seeking to explain what causes compliance, it is not so important to make sure that we collect information about compliance or non-compliance occurring after other variables of interest.

Where we are *testing theories that seek to explain why people and businesses comply or do not comply with the law*, there are two important things to bear in mind: First of all, it is very important that the data collected mirrors the differences in time in the hypothesized cause-and-causation-relation claims. Second, if one cuts short the explanatory model to be tested by using indirect measures – different proxies – as dependent variables, one should bear the limits of this in mind when drawing conclusions. It is important not to include any of the independent variables we want to test within the dependent variable.[5] For explanatory research it is better to have as tight a conceptualization of compliance as possible. Ideally the researcher would have their own factual definition of what amounts to compliance with the particular rules in the particular regime which they then measure by observation and/or experimentation. But since researchers usually do not have the technical skills and time to collect data to make this assessment,[6] other measures based on official records or respondents' interpretations of compliance will usually have to be used. We may still be able to draw valid conclusions about what causes changes in compliance using these measures – as long as we are clear about how compliance is being defined (and therefore what it is that we are explaining) and that it is being defined reliably and consistently.

If the ambition of the researcher is to *analyze and differentiate types of compliance or non-compliance*, the researcher is interested in the very fact that the concept of compliance itself is variable. This makes it more difficult to sketch out rules of conceptualizing and measuring compliance since the strategy is to explore the data, letting the data show how different measures are linked together – by using factor or cluster analyses (in quantitative research) or ground-up theorizing (in qualitative research). Once we start differentiating types of compliance, then compliance measures might begin to incorporate attitudes and motivations towards compliance as well as compliance behaviour. Thus these type of measures will not necessarily clearly differentiate between potential causes of compliance and consequences of compliant behavior or compliance itself (see Howard-Grenville 2005, 576 commenting on Gunningham et al's typology). It is not necessarily the ambition of this type of research to separate causes from consequences. But if the researcher does want to go on and describe

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[5] Or vice versa – explanatory research might also be interested in using compliance as an independent variable and testing its influence on some other dependent variable such as achievement of policy goals (such as less pollution) or cost to business.
[6] In effect making this assessment means the researcher takes on half the job of a regulatory agency him or herself – detecting and investigating potential breaches!

levels of different types of compliance, or to explain what causes different types of compliance, then the researcher needs to be clear about which conception of compliance they will be using, and must be careful to make sure that the conception they use does not incorporate into it any of the variables they wish to use to explain it. (Or vice versa if the researcher wants to use the concepts they develop as a result of analysis of different types of compliance to help explain number of breaches or compliance behaviors, then they must make sure breaches and behaviors are not included in the analytical conceptualizations they have developed.)

Different ways of measuring 'compliance' mirror different ways of understanding compliance, and often also implicit assumptions about what causes compliance. The important thing is that researchers lay out their assumptions about what compliance actually is in each case.
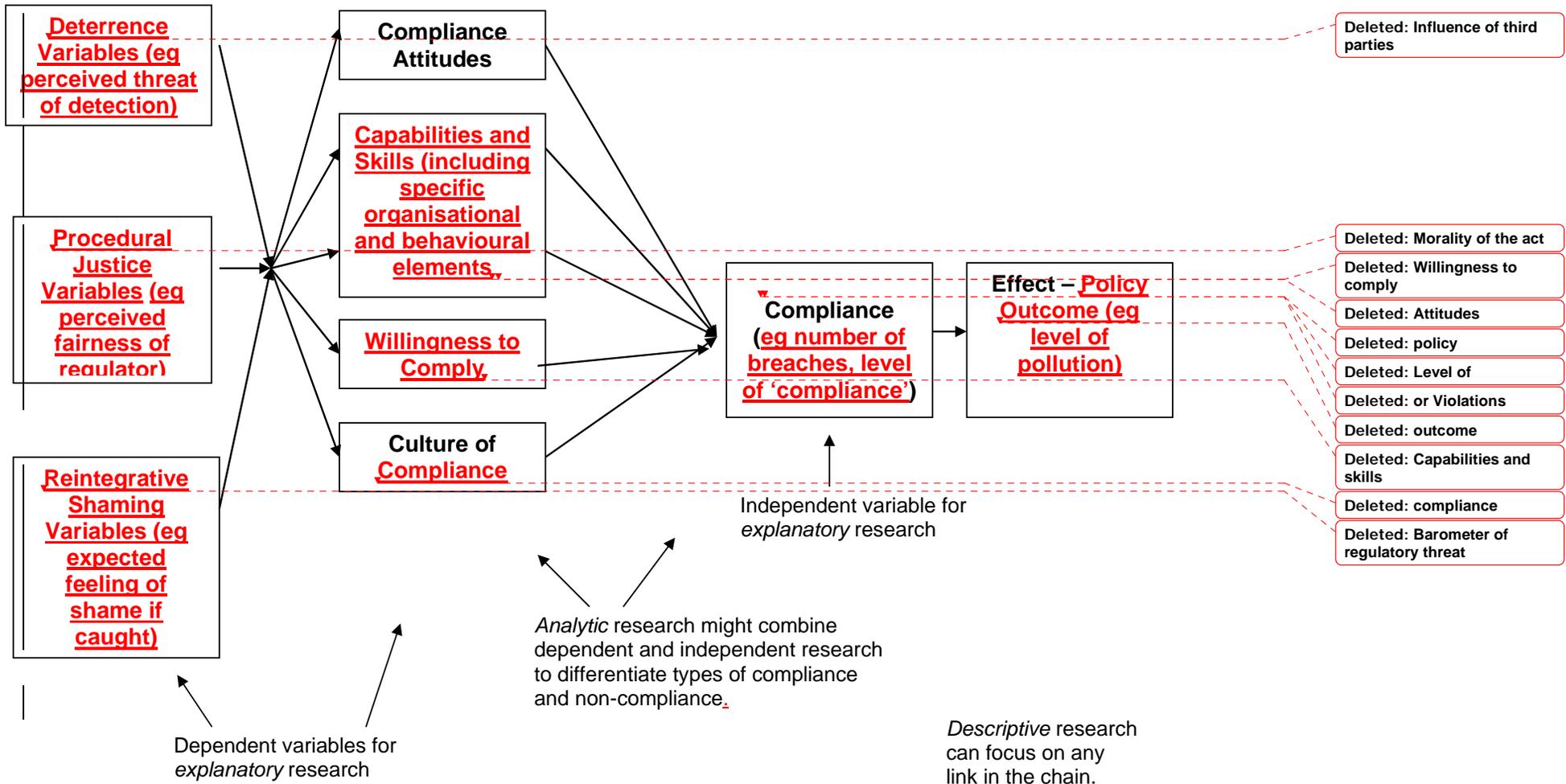
Figure 1: A Theoretical Chain of Compliance

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