

Trust – distinguishing forms, kinds, and degrees: II

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Part II: Forms of trust

Abstract

This paper is part II of a three-part project to distinguish kinds, forms and degrees of trust. In part I, I explored three kinds of trust: trust relations that are established by (i) communication between potential trustors and trustees, (ii) potential trustors and trustees engaging in coordinated practices, and (iii) potential trustors and trustees living and functioning within the same large context or “world.” In this paper I turn to the forms of trust and distinguish four: trust relations that are (i) reciprocal, (ii) symmetrical, (iii) mutual, and (iv) common in their form or structure. The framework within which these four forms of trust are explored continues that used in part I: a basic unit of trust between practical, as opposed to epistemic, agents in which a human trustor (S) trusts another agent (human or non-human), the trustee (T), to do an action (ϕ) – (*S trusts T to ϕ*). In section 1 I set up this framework and provide illustrations for human and non-human trustees. Section 2 explores these four forms of trust, providing analysis and illustrations for each; I end this section by arguing that some of these forms of trust are compatible (i.e., can co-inform a trust relation) and others or incompatible (i.e., cannot co-inform a trust relation). After a brief review of the three kinds of trust explored in part I, the final section (3) examines the links between the three kinds of trust presented in part I and the four forms of trust presented in this paper, with respect to the kinds of agents (human or non-human) that function as trustee.

Keywords: Agent, Practical agent, Human agent, Non-human agent, Artificial agent, Trust, Trust forms, Reciprocal trust, Mutual trust

1. Introduction¹

As with most meaningful relationships we might form with other people or with important parts of our world, trusting and being trusted is diverse, variable, and complex. My aim is to explore three areas of diversity that are experienced as central to the trust relation: that there are different *kinds* of trust, different *forms* of trust, and different *degrees* of trust. I believe that it is part of our experience of trusting and being trusted that we “see” that trust is complex and variable in kinds, forms, and degrees (as these are described in part I of this project). But these three possible ways that our trust varies are not independent, they seem to co-vary in systematic ways. My aim, then, is not only to distinguish these three features of trust, I will also explore how they are interrelated. As explained in part I, the motivation for this project is that in the trust literature, both mainstream and beyond, one finds a relatively large and potentially confusing set of terms used to refer to and describe these three features of trust. And – not unrelated to this state of affairs – the trust literature contains no systematic exploration of how they are connected. Given that kinds, forms, and degrees are central to our trust relationships, this (I have argued) represents a serious gap in our philosophical understanding of an important human capability: that of trusting (or not trusting) and being trusted (or not being trusted).

With respect to kinds of trust, in part I of this project I identified and explored three: (i) trust formed on the basis of communication between trustor and trustee, (ii) trust formed on the basis of the trustor and the trustee engaging in corresponding practices, and (iii) trust formed on the basis of certain network connections within the context or “world” in which the trustor and trustee(s) “live.” In this paper, part II of three, I continue this project and examine some important *forms* that our trust can have, and explore how these forms of trust are related to these three kinds of trust.

I use as my framework the standard basic unit of (practical, as opposed to epistemic) trust that I presented in part I. Briefly, trust takes place within a 3-part relational complex consisting of: (i) a *trustor* (S) – a human agent who is the one trusting, (ii) a *trustee* (T) – a human or non-human (natural or artificial) agent (e.g. an institution, domestic animal, or smart-device) that receives trust, and (iii) an *action* or a *state* (ϕ) – what the trustee is being trusted to do or to be. Within this 3-part structure, *trust* is the relation between S and T, running from S to T in the sense that the trustor activates trust of the trustee, not the other way around; *valuing* is the relation

between S and ϕ , running from S to ϕ in the sense that the trustor values the action or state the trustee is being trusted to do or to be; *executing* or *being* is the relation between T and ϕ , running from T to ϕ in the sense that the trustee does (has done, will do) the action he/she/it is being trusted to do, or the trustee is (was, will be) the way he/she/it is being trusted to be. Together, this basic unit reads: (*S trusts T to ϕ*). The definition of trust here continues the one presented and argued in part I: trust is a non-physical, mental relation between two practical agents, a trustor and a trustee, established by: (i) the trustor's decision, (ii) to normatively expect the trustee to do an action or to be a certain way, (iii) based on the trustor's belief that the trustee is relevantly trustworthy. While it is typically the case that a human trustee accepts being trusted and understands what s/he is being trusted to do, this is not necessary to the trust relation, as in the case of trusting a non-human agent. Three examples illustrate this basic trust unit:

- Jack (S) trusts his doctor (T) to be honest with Jack about the seriousness of his illness (ϕ).
- Jill (S), the accused, trusts the jury (T) to return a verdict of not guilty in her trial (ϕ).
- Sally (S), an astronaut in the International Space Station, trusts the on-board “intelligent” oxygen system (T) to provide her with the right amount of breathable air (ϕ).

In the following section (2), I define and explore some of the major *forms* of trust. In section 3, after briefly reviewing the three *kinds* of trust as these were presented in part I, I examine the connection each form of trust has to these three kinds of trust.

2. Some forms of trust

If you trust someone to do something, it might be the case that the one you are trusting also trusts you in return to do something. But it could be the case that the one you trust does not trust you to do anything (perhaps because you can't be trusted, or because there is nothing the one you trust desires or needs you to do, or because the agent you trust is not capable of trust). I call these possible variations “*forms*” of trust: that when we trust we are sometimes trusted in return and other times not trusted in return. There are four forms of trust that are especially worth exploring: first because they are commonly occurring, and second (as we will see) they have systematic connections to the three kinds of trust I distinguished in part I. While there is no fixed terminology in the trust literature for these four forms of trust, I believe these names are apt: (1) *reciprocal trust*, (2) *symmetrical trust*, (3) *mutual trust*, and (4) *common trust*.

2.1 Reciprocal trust

As a first approximation, let us say that trust is **reciprocal** if there are two trust-complexes that: (i) contain the same agents, (ii) with switched trustor/trustee positions in each, and (iii) having different actions each trustee is trusted to do. For example: Jack, an auto mechanic in a local auto repair shop, has a daughter who is having a difficult time in elementary school understanding fractions. Jill, whose has brought her car to Jack's shop for repair, is the elementary school teacher of Jack's daughter. Now suppose that Jack trusts Jill to help his daughter understand fractions; and that Jill trusts Jack to discover and repair the intermittent problem with her car. If we let ϕ represent the action of helping his daughter understand fractions, let ψ represent the action of discovering and repairing the problem with Jill's car, let S represent Jack, and let T represent Jill, then we see that this example of reciprocal trust between Jack and Jill has the form: $(S \text{ trusts } T \text{ to } \phi)$ and $(T \text{ trusts } S \text{ to } \psi)$. This, then, is the basic form of reciprocal trust; it is "2-way" or "bi-directional" trust, but not with respect to the same action or state.² In other words, given one trust complex $(S \text{ trusts } T \text{ to } \phi)$, switching these same agents in the trustor and trustee positions *and* changing the action yields a reciprocal trust complex.

We will say that trust is **non-reciprocal** if one agent trusts another and there is no respect in which that other agent trusts the trustor in return. For example: Jill (who is experiencing severe chest pains) trusts her fully self-driving car to bring Jill quickly and safely to the local hospital's ER; Jill's smart-car is not capable of trust and thus can't return Jill's trust. Or: Jack (a person of deep religious faith) trusts God to guide Jack in a very difficult and important decision with which he is struggling, but this infinitely perfect God (assuming the God of the major western monotheistic religions) would presumably not trust any human for anything (even if capable of such trust). For a third example: Jack, who is purchasing a very expensive new model smart-phone, trusts the quality control department of the company that assembled his new device to have done a thorough test of it (i.e., that the device he is buying is not defective), but that quality control department does not in any respect trust Jack because it is completely unaware of Jack and has no knowledge of who, if anyone, will be purchasing or operating that particular smart-phone. The form of non-reciprocal trust is: $(S \text{ trusts } T \text{ to } \phi)$ and $(T \text{ does not trust } S)$. This is "1-way" or "uni-directional" trust.

I want to distinguish two versions of reciprocal trust. Reciprocal trust (we will say) is *independent* when each unit of trust can (or should) exist without the other. So, for example, Jack could (and has reason to) trust Jill with respect to Jack's daughter receiving Jill's help understanding fractions in exactly the same way without being Jill's auto mechanic, and Jill could (and has reason to) trust Jack with respect to her auto repair in exactly the same way

without being the teacher of Jack's daughter. But reciprocal trust is *interdependent* if trust in one direction is conditional on trust in the other direction; if trust in one direction does not occur, or stops, there can't be trust in the other direction (or *should* not be in the sense that it would be unreasonable). Two scenarios illustrate interdependent reciprocal trust.

Scenario 1: Suppose that Jack and Jill are planning to marry each other in one month; during their past year of engagement each has had periods of doubt and "cold feet" but not about the same thing. Jack has had moments in which he thinks it is too soon for them to marry, they should wait until they are well-established in their careers. Jill, however, has had moments in which the whole "world" of marriage and family appear frightening and "not for her." But such moments of doubt always seem to pass for each and marriage at the appointed time once again clearly looks like the right thing to do. Jack and Jill know of each other's moments of doubt, and each makes the decision to trust the other: in the remaining time until the wedding day, Jack trusts Jill not to let her fears of getting married prevent her from marrying Jack, and Jill trusts Jack not to put off their marriage for the sake of their careers. We see in this scenario that not only the marriage depends on their reciprocal trust, each agent's trust also depends on that trust being reciprocated; if one agent stops trusting the other, the other stops (or should stop) trusting the one (assuming each knows of the other's change of mind).

Scenario 2: Imagine that Jack and Jill are business partners in their small start-up company. Jack does product design and Jill handles product marketing. Things are not going smoothly: each is constantly second-guessing and questioning the business decision of the other; what to one seems "helpful input and collaboration" appears to the receiver as "lack of confidence and interference." This situation has reached the point where both realize a change must take place. They discuss the problem and each agrees to give each other more independence and respect in their business decisions; they will trust each other, so long as the trust goes both ways. Jack will trust Jill to make product-marketing plans, and Jill will trust Jack to make product-design plans, and each will provide suggestions to the other only by request. Each partner's trust of the other depends on the other's trust of the one.

The form of interdependent reciprocal trust is: $(S \text{ trusts } T \text{ to } \phi) \text{ if and only if } (T \text{ trusts } S \text{ to } \psi)$.³ As the two above scenarios indicate, we would expect to find this form of trust within cooperative activities where teamwork and joint effort are required to achieve a goal and in which trust among participants plays a role.⁴

It is possible for reciprocal trust (either independent or interdependent) to have time-sensitive content such that the times of the actions, and the times of the trust, matter to the trust relations. One example of time variation might have simultaneous trust relations but not simultaneous actions: $(\text{today } S \text{ trusts } T \text{ to } \phi \text{ tomorrow}), \text{ if and only if } (\text{today } T \text{ trusts } S \text{ to } \psi \text{ today})$. Another time variation might be: $(\text{today } S \text{ trusts } T \text{ to } \phi \text{ today}) \text{ and } (\text{tomorrow } T \text{ trusts } S$

to ψ within the next week).⁵ Pushing such time-variations to the extreme, there would appear to be a length of time separating each trust complex sufficiently great to make reciprocal trust difficult to conceive. For example, where S and T are individual human agents: (*today S trusts T to ϕ today*) and 50 years later (*today T trusts S to ψ tomorrow*), though not impossible, would not likely count as reciprocal trust. There is, however, an interesting case in which reciprocal trust would seem to reach across generations: that of long term projects. Consider the following (science-fiction) scenario: a space vehicle is launched from earth containing a small community of humans, bound for a distant planet very much like earth, that will be reached and colonized by humans (if the space mission is successful) only when the fifth generation on board the space vehicle has matured into adults. It seems correct to say that those who initiated this long-term project (S) trust that future 5th-generation (T) to complete the colonization project as planned (ϕ), and that the 5th-generation of humans that lands on that distant earth-like planet (T) trust the earth team that initiated their project (S) to have planned a worthwhile project that they are now completing (ψ). If trust can be inter-generational, as it seems it can, then there can be inter-generational reciprocal trust.

2.2 Symmetrical trust

Let us say that trust is ***symmetrical*** if there are two trust-complexes that: (i) contain the same agents, (ii) with switched trustor/trustee positions in each, and (iii) having the same action each trustee is trusted to do. That is, two agents value the same action and trust each other to do it (either simultaneously or in turn). For example: Jack and Jill are new parents, and Jack trusts Jill to parent their child wisely, and Jill trusts Jack to parent their child wisely. Or, Jack and Jill are part of a team whose members are cooperating to achieve a common goal; Jack trusts Jill to stay with their team until the project is completed, and likewise Jill trusts Jack to stay with their team until the project is completed. The form of symmetrical trust is: (*S trusts T to ϕ*) and (*T trusts S to ϕ*).

In the case of symmetrical trust it might appear that it does not (rationally) matter which position an individual agent takes (trustor or trustee), because of the symmetry of this form of trust. But where there is time-sensitive content, for example where the agents take turns in the trustor's position, it might matter which agent goes first. Consider this scenario: Jack (S) is a "morning person" who does not function well in the evening, whereas Jill (T) is a "night person" who does not function well in mornings. Imagine that Jack and Jill are co-authors writing an advanced mathematics textbook, and that ϕ 'ing = checking proofs in the draft of chapter one, an activity which each must do requiring mental alertness and concentration. Jack and Jill trust each other to ϕ , making the form of their trust symmetrical; but this trust is time-sensitive: Jack asks Jill to trust him to ϕ tomorrow morning and Jill does, whereas Jill asks Jack to trust her to ϕ

tomorrow night and Jack does. However, had Jill asked Jack to trust her to ϕ tomorrow morning, Jack would not; and the same if we switched these agents for the evening request for trust. Switching agents in trustor/trustee positions is not always arbitrary in symmetrical trust.

As in the case of reciprocal trust, symmetrical trust can be *independent*: each agent's trust of the other agent can remain the same (that is: it would be reasonable to continue trusting) if that agent's trust was not (or no longer) mirrored. For example: when Jack and Jill were new parents, each (symmetrically) trusted the other to parent their child wisely. Jill, however, has since shown several instances of poor judgment (by Jack's standards) in activities with their child, enough that Jack has grown skeptical of Jill's parenting abilities and has stopped trusting Jill to parent their child wisely. Jill understands Jack's lack of trust in her in this regard, but she continues to trust Jack to parent their child wisely. For another example of independent symmetrical trust: suppose Jill stops trusting Jack to stay with their team until the project is completed (say, Jill believes that Jack is giving up on achieving the common goal and is no longer trustworthy in this regard); Jack, nevertheless, continues to trust Jill to stay with their team until the project is completed. And conversely, should Jack stop trusting Jill to stay with their team until the project is completed (say, Jack believes that Jill, who has become ill and can no longer show up, is no longer trustable in this regard), Jill would nevertheless still trust Jack to stay with their team until the project is completed.

Symmetrical trust can also be *interdependent*: each agent's trust is conditional on the other agent's trust in the sense that it would be unreasonable (practically) for one agent to trust (or to continue trusting) the other given that the other agent does not trust (or has ceased to trust) in return. For example: suppose Jack and Jill are the only two members of a team and are cooperating to achieve a goal that can't be achieved by each working alone. Jack and Jill, we will assume, each (symmetrically) trust the other to stay with their team until the project is completed. Each one's trust, however, is conditional on that of the other; if either agent stops trusting the other to stay with their team until the project is completed, the other agent *should* stop trusting the one; that is, trust that is not returned in such a scenario would have no justification, for without trusting the other to do his/her part, the one agent would (or *should*) conclude that continued efforts are doomed to fail, making the other's trust in the one agent without justification. We see that interdependent symmetrical trust has the form: *(S trusts T to ϕ) if and only if (T trusts S to ϕ)*.⁶

2.3 Mutual trust

Let us say that trust is *mutual* if at least two (human) agents trust the same (human or non-human) agent in the same respect. There is mutual trust, then, when there are two (or more)

trust complexes that are: (i) similar in having the same trustee and (ii) the same action in each, but (iii) are different with respect to the trustor.⁷ For example: all the passengers on a commercial airline flight ($S_1, S_2, S_3, \dots S_n$) trust (we will assume) the plane's flight crew (T) to fly the plane to the announced destination (ϕ). These trustors mutually trust their flight crew with respect to that action. But they do not trust "collectively" (i.e. as a "collective trustor") as they would if these passengers were organized into a single artificial agent that "spoke" and "acted" as one, as in the case, for example, when one nation (S) trusts another nation (T) to honor their trade agreements (ϕ). Rather, to qualify as mutual trust these passengers must trust their flight crew "distributively," that is, as separate individual agents. The form of mutual trust is: (S_1 trusts T to ϕ) and (S_2 trusts T to ϕ) and (S_3 trusts T to ϕ) and This is equivalent to: (S_1 and S_2 and $S_3 \dots S_n$ (each) trusts T to ϕ).

Mutual trust, we recognize, has the same two versions as do reciprocal and symmetrical trust: *independent* and *interdependent*. Take the case of two trustors whose trust is mutual. This trust is independent if one trustor has sufficient reason to trust (i.e., should continue trusting), even though the other trustor stops trusting. The form of independent mutual trust, for two trustors is: (S_1 trusts T to ϕ) and (S_2 trusts T to ϕ). The following two scenarios illustrate this form of trust.

Scenario 1: Jack and Jill are neighbors and their residential area is experiencing an electrical power outage. Both have notified the utility company that provides electric power to the area, and each has been assured by the company that "it is doing everything possible to restore power to the area." Jack (we will assume) trusts the company (that is, in the person of its workers) to restore the electric power as soon as possible, and Jill likewise trusts the company (its workers) to restore the electric power as soon as possible. Jack and Jill have mutual trust: each trusts the same agent to do the same action. But Jack's trust and Jill's trust are *independent* in the sense that each trust complex can exist without the other; each would trust this trustee in the same way had the other not lost electric power, or had the other had electric power restored sooner and so stopped trusting.

Scenario 2: NASA technicians are guiding an astronaut back to earth from the International Space Station, and this astronaut has a husband and a brother. Both the astronaut's husband and the astronaut's brother (mutually) trust the NASA technicians to bring the astronaut safely back to earth. This mutual trust is *independent* in the sense that each trustor would trust the NASA techs in the same way if the other trustor didn't exist, or if the other (for some reason) stopped trusting the NASA techs in this regard.

Mutual trust is interdependent if each trustor's trust is conditional on the other's trust; if one agent withholds trust from, or ceases to trust, the trustee, then the other agent(s) withholds trust from the trustee (i.e., should withhold trust or cease trusting). The form of

interdependent mutual trust for two trustors is: $(S_1 \text{ trusts } T \text{ to } \phi) \text{ if and only if } (S_2 \text{ trusts } T \text{ to } \phi)$. Consider the following scenario.

Scenario 1: Jack (S_1) and Jill (S_2), before filing for divorce, have agreed to see a marriage counselor (T). Jack and Jill mutually trust T to help them discover if their marriage can be saved or not (ϕ). Jack and Jill both recognize that if one does not completely trust T to ϕ , the marriage counselling won't work and there is no reason for the other to continue marriage counselling alone. After the third meeting, Jill develops a deep distrust toward T with respect to ϕ ; she tells Jack of her distrust and her decision not to continue marriage counselling with T. Once Jill's trust of T to ϕ has stopped, Jack's trust of T to ϕ is no longer justified. If we switch Jack and Jill in this scenario, we see that Jill's trust of T to ϕ is conditional on Jack's trust of T to ϕ ; once Jack's trust turns to distrust, it is no longer reasonable for Jill to trust T to ϕ . In this scenario we have the form of interdependent mutual trust: $(S_1 \text{ trusts } T \text{ to } \phi) \text{ if and only if } (S_2 \text{ trusts } T \text{ to } \phi)$.

Mutual trust, as with other forms of trust (except non-reciprocal trust), typically occurs at the same time; $(\text{today } S_1 \text{ trusts } T \text{ to } \phi) \text{ and } (\text{today } S_2 \text{ trusts } T \text{ to } \phi)$. This would be the case, for example, when (during the flight) each passenger on an airline trusts the flight crew to fly their plane to the scheduled destination. But we see that this need not always be the case; mutual trust might have time sensitive content. Perhaps $(\text{today } S_1 \text{ trusts } T \text{ to have } \phi'ed \text{ yesterday}) \text{ and } (\text{tomorrow } S_2 \text{ trusts } T \text{ to have } \phi'ed \text{ the day before yesterday})$. While the trust relations between trustors and trustee might occur at different times, because mutual trust has only one agent as trustee and only one action the trustors each values (and trust the trustee to carry out), there cannot be "different times" at which that one action takes place that would undermine its identity of being that one action.⁸

2.4 Common trust

When an agent trusts another agent to do something, the action at issue might be physical or it might be mental. Suppose, for example, that Jack (S) trusts his wife Jill (T) to pay the household bills on time (ϕ). Here ϕ represents an ongoing physical activity. But, if Jill (S) trusts her husband Jack (T) to be supportive of her decision to re-enlist for a lengthy tour of military duty (ϕ), then the "action" at issue is a mental (emotional) event or state-of-mind. Many of the most important and meaningful trust relations between human agents involve actions or states that are, in this sense, mental. For example, in various situations we might trust others to be: reasonable, courageous, honest, caring, faithful, loyal, loving, protecting, forgiving, uncritical, or sensitive to our feelings and moods. There are other situations in which we value "negative" mental actions/states and might trust others to be: unresponsive, angry, dishonest, unforgiving, uncaring, or disloyal relative to various states-of-affairs.

One of the most important mental acts we trust others to exercise is to *trust* us with respect to some (typically important) activity or project. For some agents, being trusted could make all the difference in some of their undertakings, yet trust is not something an agent can demand of others or be assured of from others; rather, the agent must *trust* others (whose trust is important) to trust the agent in his or her activities. To illustrate, imagine that Jack, a successfully recovering alcoholic who has not had a drink for three years, has recently been experiencing work-related stress. Jill, Jack's wife, plans to buy a bottle of wine as a gift for her friend. Here is their discussion:

Jack: *I need to go out and will pass near the wine store; why don't I pick up that wine-gift for you while I'm out.*

Jill: *Oh, that's nice of you, but I'd rather get it myself.*

Jack: *What's wrong? Don't you trust me to pick up the wine?*

Jill: *Well, you have been under stress lately, but I do trust you not to start drinking again; it is important that you trust me in this. You have been strong these last three years: I do trust you to stay away from alcohol.*

Jack: *And it is important to me that you trust me in this way; your trust is something I've always trusted you to give me.*

Here we have the following trust-complex: (Jack trusts Jill to trust Jack to stay away from alcohol); and from the dialogue between Jack and Jill, we see that each agent's trust sustains the other agent's trust. If we let $S = \text{Jack}$, $T = \text{Jill}$, and $\phi = \text{stay away from alcohol}$, and use "(...)" to bracket the action/state the trustor values, this trust-complex has the form: (*S trusts T to (trust S to ϕ)*). T values what is enclosed in the smallest set of parentheses: (ϕ 'ing), and S values what is enclosed in the next outer set of parentheses: (T trusts S to ϕ); one agent's trust is about the other agent's trust of that one agent. When such trust is reciprocal in form, I will call it: **common** trust.⁹

Trust is common if it is:

- (i) reciprocal (for it is bi-directional, each agent is both the trustor and the trustee), but not symmetrical (for the action/state each trustor values is different; it is the trust of the *other* agent to trust the one agent);
- (ii) interdependent (for each agent's trust is conditional on the other's trust);
- (iii) higher ordered (for the action or state each trustor values, and trusts the trustee to do or to be, contains or nests the trustee's trust of the trustor).

To illustrate, consider the above example of symmetrical interdependent trust: (Jack trusts Jill to parent their child wisely) and (Jill trusts Jack to parent their child wisely). If we now let each of these symmetrical trust-complexes become the actions (the ϕ position) the other agent values, we satisfy condition (iii): that common trust contains a higher order of trust and a lower

order or nested level of trust. This changes symmetrical trust into reciprocal trust, because the lower order or nested trust now contains different agents; this yields an example of *common trust*: (Jack trusts Jill to trust Jack to parent their child wisely) if and only if (Jill trusts Jack to trust Jill to parent their child wisely). We have common trust when, for example, two agents say to each other: “I am trusting you to trust me to...”. The basic form of common trust is: *(S trusts T to trust S to ϕ) if and only if (T trusts S to trust T to ψ)*.

Once the basic form of common trust is set, we see that there are several possible variations. One possibility is that the action in the ϕ and the action in the ψ nested positions can be the same action, as in the example of Jack and Jill just presented: *(S trusts T to trust S to ϕ) if and only if (T trusts S to trust T to ϕ)*. Time sensitive content introduces a different set of possibilities. Here are three:

- (a) *(today S trusts T to trust S to ϕ today) if and only if (today T trusts S to trust T to ψ tomorrow);*
- (b) *(today S trusts T to trust S tomorrow to ϕ tomorrow) if and only if (today T trusts S to trust T tomorrow to ψ next week);*
- (b) *(today S trusts T to trust S today to have ϕ 'ed yesterday) if and only if (tomorrow T trusts S to trust T tomorrow to ψ next week).*

Such time sensitive possibilities are neither far-fetched nor overly abstract. Here is a realistic illustration. Imagine the following long-term project that requires intergenerational cooperation and reciprocal trust: a nation today taxes its working citizens in order to provide for health care services today of its elderly population, on the promise (the “social contract”) to these working citizens that in the next generation when they are elderly, the future generation of working citizens will be taxed at an even higher rate to provide for their future (more expensive) elderly health care needs. Such a long-term project requires intergenerational cooperation and trust. This trust, I would argue, is not just reciprocal between current and future generations; it is a realistic instance of common trust. It is reciprocal in so far as: (today’s working citizens (S) trust the next generation of working citizens (T) not to revoke tomorrow this tax plan when S is elderly (ϕ)) if and only if (tomorrow’s next generation of working citizens (T) trust the former generation of working citizens (S) to have made today a financially feasible and responsible tax plan (ψ)); in symbols: *(today S trust T to ϕ tomorrow) if and only if (tomorrow T trusts S to have ψ 'ed today)*. But the current generation of working citizens of this imaginary nation can’t *force* the next generation to trust them to ψ , nor can it guarantee themselves that they will; they must *trust* them to do so. Likewise, the next generation of working citizens can’t retroactively *make* the current generation trust them to ϕ , they must *trust* them in this regard. This higher order 2-way trust makes this an instance of time sensitive common trust between generations of the form: *(today S trusts T to trust S tomorrow to have ψ 'ed today) if and only if (tomorrow T trusts S to trust T today to ϕ tomorrow)*.

If common trust has, minimally, a bi-level structure – that is: a (nested) ground-level first-order of trust and a second-order of trust of that trust – is there the possibility of a third or higher orders of trust? Clearly there is; given that trust is composed partly of a (normative) expectation, and that – in principle – orders of expectations between two agents have no upper-bound, it would seem that the orders of trust could continue without limit (or at least we see that there is nothing in the nature of the trust relation that would represent an upper limiting condition).¹⁰ There is nothing, for example, incoherent in a third (or higher) level of common trust: (*S trusts T to trust S to trust T ... to ϕ*) if and only if (*T trusts S to trust T to trust S ... to ψ*); on one side all the orders of trust take place within one agent's trust: S's, and on the other side all the orders of trust take place within the other agent's trust: T's. However, this is more a theoretical possibility than a practical possibility; our experience of trust between practical agents in situations involving common trust confirms the occurrence and the importance of the minimal lower-/upper-order possibility, especially between agents who are intimates, but imagined scenarios of common trust of three or higher orders appear artificial and unrealistic.¹¹

2.5 Forms of trust

How are these four forms of trust interrelated: (1) reciprocal/non-reciprocal, (2) symmetrical, (3) mutual, (4) common? A given instance of trust can have more than one form. An instance of mutual trust, for example, might also be reciprocal or it might be non-reciprocal. An instance of common trust must be reciprocal in form, although an instance of reciprocal trust might or might not also be common trust. However, there are some forms of trust that are mutually exclusive; no instance of trust, for example, can be both non-reciprocal and either symmetrical or common.

Rather than argue for each case of compatible or non-compatible forms of trust by constructing examples, I summarize possibilities in the following (5 x 5) grid using these symbols:

R = reciprocal trust,

N = non-reciprocal trust,

S = symmetrical trust,

M = mutual trust,

C = common trust,

y = yes, these two forms of trust are compatible, i.e. can “co-inform” one instance of trust,

n = no, these two forms of trust are incompatible, i.e. cannot “co-inform” one instance of trust.

| | R | N | S | M | C |
|---|---|---|---|---|---|
| R | - | n | n | y | y |
| N | n | - | n | y | n |
| S | n | n | - | y | n |
| M | y | y | y | - | y |
| C | y | n | n | y | - |

3. Forms of trust and kinds of trust

I start with a brief review of the three kinds of trust that were defined and explored in part I of this project: (1) communication-based trust, (2) practice-based trust, and (3) context-based trust.¹² I keep to the basic form of trust as my general framework: (*S trusts T to ϕ*) where S is a human agent and T is a human or a non-human agent.

(1) Communication-based trust is any trust complex that comes about based on communication between the agents. This kind of trust requires agents to have a means of communication between them; typically a common natural language, but perhaps a common artificial language or signaling system sufficient to communicate to each other: (i) that one is taking on the role of trustor and the other that of trustee, (ii) what the trustee is being trusted to do, and (iii) an agreement or understanding that a trust relation between them exists. Both human agents (HAs) and some artificial agents (AAs) have such communication ability. AAs with language ability fall into one of two possible categories; such an AA is either a group of HAs organized to function as a single practical agent (a group artificial agent - GAA), or it is a “smart-machine” – a device with enough (artificial) intelligence and (functional) autonomy to operate as an agent (a machine artificial agent - MAA). Examples of the first category include government agencies (IRS, FDA), business corporations (Apple, Mercedes-Benz), and social institutions (the Episcopal Church, NRA). Such GAAs are able to “speak with one voice,” and are capable of entering a trust relation; thus, communication-based trust is possible between HAs and these AAs. Examples of the second category include the (typically “female”) agents in the operating systems of smart-phones (e.g. iPhone’s Siri) and the voice-recognition systems (also typically “female”) operated

by many businesses with which HAs communicate to order products and services. As trustor, HAs can and do establish communication-based trust relations with other HAs and with GAAs and MAAs having communication ability.

(2) Practice-based trust is any trust complex that comes about by agents engaging in practices. Such practices typically place the agents engaged in them in cooperative, or at least coordinated, interactivity. Because a practice is a publically recognized convention, i.e. a pattern of behavior governed by publically known more-or-less formal or informal agreement/acceptance, by engaging in a practice agents typically understand what position the practice assigns: trustor or trustee. The agent (S) who mails his/her expired passport to a government agency (T) to be renewed (ϕ) understands s/he is engaged in a passport-renewal practice as trustor, and the government agency “understands” it is engaged in a passport-renewal practice in the position of trustee, with respect to ϕ 'ing. In practice-based trust, HAs establish trust relations with other HAs, with GAAs, and MAAs.

(3) Context-based trust is any trust relation that comes about through the network structure of the community or “world” in which an agent lives a particular kind of “life.” The “life” or “world” of a journalist in a large city, for example, is not that of the “life” or “world” of a parent in a rural community; each has its own typical range of trust relationships, even though the same agent might “live” in both “worlds.” The “life” or “world” of a local politician, with its particular set of trust-complexes, is not that of the life” or “world” of a local farmer, with its own typical set of trust-complexes, even when the same agent is both. A “life” or “world,” in this sense, is a complex and relatively large human environment in which human agents are provided the place and the space to realize potentials, pursue long-term projects, and attempt to achieve what they value; each such “life” or “world” provides an agent the opportunity (perhaps the requirement) to establish particular trust relations typical of that context.

Such “lives” or “worlds” are not without organization, though they are not designed and controlled in every detail by, say, a governing power. They tend to be loosely organized from the “ground up” as flexible and changing contexts, each containing a variety of human and non-human agents, systems and processes, forming a “web” of chains of causality, dependency, and reliance that links its various parts. Connections of causality, dependency and reliance give such contexts a network structure, forming lines and chains of near and remote, past and future, influence, communication, and efficacy among its components, its “nodes.” An agent who lives a “life” in a given “world” can have his/her trust “carried” to remote trustees, and to significantly large parts of his/her world via its network structure. An agent’s trust relations, typical of the agent’s context, can reach “globally,” remotely, and into the past and future, by *supervening* on the network structure of the agent’s context.

Given these three kinds of trust and the four forms of trust explored above, the question I now turn to is: what are the connections between these kinds and forms of trust? (I mean by this question: conceptual connections – for example, relations of compatibility or incompatibility, and entailment – not statistical/empirical connections of correlations or probable causality.) I note, first, that any instance of a trust relation must be of some kind or other and have some form or other. Thus, on a general level “kind” and “form” of trust co-occur and these two property categories are not independent; a kind of trust entails some form or other of trust, and a form of trust entails some kind or other of trust. But is every kind of trust compatible with every form of trust, and does any particular kind of trust entail (or be entailed by) any particular form of trust? The answer depends, we see, on another variable in the trust complex: the kind of agent that occupies the *trustee* position. To review: trustees are either (i) *human agents* (HAs) or non-human agents, and if non-human then either (ii) *domestic animals* (DAs such as a search-and-rescue dog) or an artificial agent (AAs); if an AA, then either (iii) a *group of human agents* organized as a single practical agent (GAAs such as an institution or government agency), or (iv) a *smart-machine* (MAAs – devices with enough intelligence and autonomy to function as an agent, such as a fully self-driving automobile).

Given that S is a human agent (HA) in (*S trusts T to ϕ*) where T is also a HA, each kind of trust is compatible with each form of trust. So, communication-based trust might be reciprocal or non-reciprocal, symmetrical or not, mutual or singular, common or not. Similarly with practice-based and context-based trust; each kind can be any form when the trust relation has HAs in both trustor and trustee positions. Where the trustee is a non-human agent, however, there are fewer kind-form possibilities. Specifically, each kind of trust is possible between a HA and a non-human agent, but several forms of trust are not possible. Reciprocal, symmetrical, and common trust between two agents, whether independent or interdependent, requires the possibility that each agent is capable of trusting. Thus, these forms of trust are not possible between a HA and any non-human agent that is not capable of trusting.

For a potentially controversial example (and without taking a stand one way or the other), we know that practice-based trust takes place between a human trustor and certain domestic animal trustees. Seeing-eye dogs, for example, receive trust from their human owners but are not, it would seem, capable of trust; thus, there can't be reciprocal, symmetrical, or common practice-based trust between HAs and their trusted domestic animals; the form of this trust must be non-reciprocal. (Of course, if such domestic animals are capable of trust, then reciprocal, symmetrical, or common practice-based trust would be possible between humans and domestic animals.) A relatively uncontroversial category of potential trustees that are not capable of reciprocal, symmetrical, or common forms of trust is that of certain artificial agents

(AAs). We trust various MAAs, smart-machines and intelligent devices and systems such as the automatic pilot system that flies and lands commercial airplanes in dangerous weather conditions, the smart-robots that perform delicate surgery, and the computer-executed algorithms that make assessments, decisions, and trades on international financial and commodity markets. Some of these MAA trustees are trusted by communication (namely: those with language ability), others by practice, and still others by context. But trust relations between HAs and such MAA trustees can only be non-reciprocal in form, for they are not (yet?) capable of trust.

In so far as GAAs are capable of trust, it is possible for HAs to establish reciprocal, symmetrical, and common forms of communication-, practice-, or context-based trust with GAAs as trustees. And it would seem that GAAs are capable of trust; it seems legitimate, for example, to say that there is reciprocal (or symmetrical, or even common) practice-based trust between two business corporations with respect to each one's contribution to the production of a product for which each has a government contract, or to say that there is reciprocal (or symmetrical, or even common) communication-based trust between two nations with respect to not cheating on a trade agreement to which each is signatory. The following scenario illustrates communication-based interdependent reciprocal trust between a HA and a GAA.

Scenario: Jack is the legal counsel hired by a small privately owned business "Northeast Microbrew Services" (NMS) to negotiate an out-of-court monetary settlement with a former client who has initiated a law suit against NMS. Jill is the owner and CEO of NMS. Before Jack accepted NMS as a client, he met with Jill and NMS's top management and announced his conditions: NMS must not constrain his negotiations; he plans to use a novel negotiation strategy and he must be granted wide latitude in negotiations and be trusted to win NMS the best deal with the former client that keeps NMS out of court. NMS agrees, and then tells Jack NMS's expectations: in all his negotiations with their former client, Jack is to represent NMS as a socially responsible business that values its good reputation with all its clients; NMS will trust Jack to present NMS in this image. If $S = \text{Jack}$, $T = \text{NMS}$, $\phi = \text{negotiate the best deal for NMS}$, and $\psi = \text{present NMS in the best light}$, then the form of trust in this scenario is: ($S \text{ trusts } T \text{ to } \phi$) if and only if ($T \text{ trusts } S \text{ to } \psi$). In kind, this is communication-based trust between Jack and NMS; in form, it is interdependent reciprocal trust between a HA and a GAA.

Mutual trust relations, whether independent or interdependent, between HAs and non-human agents are certainly possible by communication, by practice, and by context; but – extending the argument in the third paragraph above – these cannot take the form of reciprocal, symmetrical, or common trust for all cases in which the non-human trustee is not capable of trusting. Jack and Jill might mutually trust the same bomb-sniffing dog (DA) to identify the

location of an explosive device, the same public-utility smart electrical grid (MAA) to activate their clothes washer and dryer only during off-hours when electrical power is least expensive, or the same self-driving smart-car's GPS system (MAA) to bring them to an important destination. Assuming the receiver of Jack and Jill's mutual trust in these examples are not capable of trust, these trust-complexes must have the non-reciprocal form.

4. Concluding remarks

I have argued that our experience shows us that trust comes in kinds, in forms, and in degrees. The three kinds of trust, as presented in a previous paper (part I), function as an expansive feature of trust, enlarging the range and reach of our trust. If, say, practice-based or context-based trust relations were not possible, if we were limited only to communication-based trust, there would be far fewer trust relations in our lives and trust's value could not be as great as it is. In this paper, part II, we see that forms of trust have an opposing function; forms constraint and put conditions on possible trust relations by restricting the practical agents with which we are able to enter a trust relation. Human agents have the largest range of trust possibilities; a human trustor is able to trust a human trustee (given sufficient competence and autonomy with respect to the action at issue) in each of the four forms of trust examined above. We see that non-human agents, however, are restricted to certain forms of trust, depending on what kind of non-human agent occupies the trustee position. Those capable of trusting (GAAs and – controversially – perhaps some DAs) can function as trustee in each of the four forms of trust. But any agents not capable of trust (MAAs and – less controversially – perhaps DAs) are limited to non-reciprocal forms of trust. While there are, no doubt, interesting variations on the four forms of trust examined above that I have neglected (e.g., where a reciprocal trust complex is a mix of independent and interdependent variations), and perhaps other forms of trust less widely experienced than these four, I end my exploration of trust forms and turn to part III of my project: the important topic of degrees of trust and the question of the connection between the trustor's trust and trustee trustworthiness.¹³

Notes:

1. This Introduction is a brief statement of material worked out in the Introduction to part I of this project. For references to the trust literature and supporting citations, see “Trust – distinguishing forms, kinds, and degrees: Part I” available at: <http://rivier.edu/faculty/lcarr> (under the section: Writings).
2. The terminology here, and for the other forms of trust I explore, is not standard in the trust literature. Hardin (2006, 44ff), for example, examines investigations of 2-way or bi-directional trust in game theory under the term “mutual trust,” and refers to non-reciprocal trust as “one-way” trust.
3. As will become clear in part III on degrees of trust, the bi-conditional “if and only if” is meant to apply to reasonable trust, not “irrational” trust. Thus, to be more precise the statement should be: (it is reasonable for S to trust T to ϕ only if T trusts S to ψ) and (it is reasonable for T to trust S to ψ only if S trusts T to ϕ). Except for one point, I believe the classic case of interdependent reciprocal trust would be the stag hunt game, in which the cooperative (Nash) equilibrium is chosen (and in the iterated case, sustained) because the players’ trust of each other to cooperate is greater than the risk of defection. The one point of hesitance is that in the stag hunt, as typically presented, the players trust each other with respect to the same (not different) actions (that is: each player’s action falls under the same description).
4. Given my aim in this paper, I skip the possible mixed variation in which one agent’s trust, say S’s trust of T to ϕ , is independent of T’s reciprocal trust of S to ψ , but the other agent’s trust, T’s trust of S to ψ , is conditional on S’s reciprocal trust of T to ϕ .
5. In such cases of time differences, there is the obvious question of one agent trusting (today) another agent to trust reciprocally (tomorrow) the one agent in return. This “trust to trust” requires clarification and will be addressed below in the section on common trust.
6. The same qualification applies here as it does to the bi-conditional in the case of interdependent reciprocal trust; see note 3. The classic instance of interdependent symmetrical trust is the stag hunt game, only without the exception mentioned in note 3.
7. I use the term “mutual” in its meaning “common,” as in, “We have a mutual friend.” not in its meaning “reciprocal,” as in, “The President and the Vice-president have mutual respect.”
8. “Different times” is in scare quotes because there is a difference between: (i) an action being done at one time, and then the “same” action being repeated at another time, and (ii) one action that takes up a shorter or longer length of (different) times, or is interrupted by shorter or longer periods of inactivity before being completed. Mutual trust rules out (i) but is compatible with (ii).
9. I take the name “common trust” from the concept of “common knowledge” in epistemology, because of the similar structure. For common knowledge see the Vanderschraaf and Sillari entry “Common Knowledge” in E. Zalta, ed. *Stanford Encyclopedia of Philosophy*. Online at: <http://plato.stanford.edu/entries/common-knowledge/>
10. The classic philosophical analysis of orders of expectation is Lewis (2002); see Section 3 “Solving Coordination Problems” of Chapter I, pp. 24ff, and Section 1 “Common Knowledge” of Chapter II, pp52ff.

11. Baier (1991) explores the complexities of trust between intimates; see especially her application to the trust relation of Scanlon's four principles that should govern the back-and-forth expectations that arise between two agents who make promises to each other (pp. 114ff).

12. For a more complete presentation of communication-based, practice-based, and context-based trust, see part I, section 3 in Carr (2014).

13. I own a debt of gratitude to my colleague, and fellow explorer of the world of trust, Herman Tavani; his on-going discussions, helpful suggestions and critical reactions have made me re-think several point and have improved this paper in many ways.

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