

# Illuminating the principles of social exchange theory with Hawthorne studies

Social  
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## Abstract

**Purpose** – The purpose of this paper is to suggest Homans' social exchange theory (SET), a management theory, as an explanation for some of the findings of some of the Hawthorne experiments (1924-1933), which demonstrated how social situations play an important role in task performance and productivity and how social exchanges can facilitate it. The authors also use SET to investigate Elton Mayo's inquiry as to what caused spontaneous cooperation in Hawthorne.

**Design/methodology/approach** – The authors used a combination of published work by Homans, Roethlisberger and Dickson, Mayo and others, as well as oral histories conducted by Greenwood and Bolton in 1982-1984, to argue that some of the Hawthorne studies illustrate the principles of SET. Homans' SET brought together concepts from multiple disciplines and offered a framework to explain social behaviors.

**Findings** – The relay assembly room and the bank wiring tests of Hawthorne studies can illustrate SET as developed by Homans. With the development of SET, Homans not only provided explanations for the creation of strong feelings of affiliation and trust through interactions and mutual dependence between group members but also provided evidence to Mayo's concept of spontaneous collaboration.

**Research limitations/implications** – The limitations of the paper are that the studies themselves can lend themselves to multiple perspectives due to design flaws. Therefore, our argument is only one interpretation – even if it is something that the researchers would have supported.

**Originality/value** – The paper augments the ongoing discussion about the Hawthorne studies in the literature and in the development of management theories such as SET. The authors provide support that it is through the attempts to explain the Hawthorne studies and the post-Second World War controversies over the studies that Homans developed social exchange. Building on previous work, the methods show perspectives beyond the motivations and sentiments of Homans by demonstrating observable behaviors from the Hawthorne studies.

**Keywords** Social exchange theory, Elton Mayo, George Homans, Hawthorne studies

**Paper type** Research paper

## Introduction

The Hawthorne studies are arguably the most famous studied in management, if not the social sciences more generally, as well as the most misunderstood. They were the “most audacious social scientific study ever made in the workplace” (Adams and Butler, 1999, p. 119). They resulted from experiments at the Hawthorne Electric Works in Cicero Illinois in the late 1920s and early 1930s under the nominal supervision of Elton Mayo. George Homans (1910-1989), who was a student of Mayo at Harvard University, was affected by Mayo's explanation of the studies and defended the studies, industrial sociology and Elton



Mayo from various critics (Homans, 1949a, 1949b). The studies were also critical in the creation of social exchange theory (SET) by Homans, which helped explain the findings by providing an overarching theory to how groups influence behavior (Homans, 1984).

While SET is one of the most prominent theories in the organizational behavior literature, making it one of the most researched, validated and influential theories in the field (Cropanzano and Mitchell, 2005), its relationship to the Hawthorne studies has not been fully investigated in the literature. The studies that have researched this relationship have either noted the work of Homans (Muldoon, 2012), his work on industrial sociology (Appold, 2006) or his relationship with Mayo (Muldoon *et al.*, 2018). This paper attempts to use SET as a potential explanation for the results of the Hawthorne studies by providing evidence from the Hawthorne studies; specifically, from the relay assembly room and the bank wiring tests. By providing illustrations for key theoretical components of SET in the Hawthorne studies such as group cohesion, solidarity, and reciprocity, the paper argues that some of the Hawthorne studies helped to establish SET. In doing so, we hope to link Mayo's original purpose with SET. We do not suggest that SET caused the results – we argue that studies were too poorly designed to know what really happened, a point also made by Homans (1949a, 1949b).

What we suggest is that SET, and its principles, could be found within the Hawthorne studies – especially with Mayo's (1919) concern over spontaneous co-operation, a concept he wrote about as early as 1919, as a necessary condition for civility in society to be maintained. George Homans used some of these relations to develop SET – which he had done in his earlier work, the *Human Group* (1950). In following Homans's footsteps, we use a combination of George Homans (1941, 1950, 1961) published work, *Management and the Worker* (Roethlisberger and Dickson, 1939); Mayo's (1933, 1945) writings and oral histories conducted by Greenwood and Bolton (1982, 1984) – as Homans was trained in the interview method (Homans, 1984). Our purpose is twofold: to use the Hawthorne studies to illustrate the principles of SET and to provide further perspective of how SET came into being and helped explain Mayo's quest for *spontaneous collaboration*. Our methods are different from previous work (Muldoon *et al.*, 2013; Muldoon *et al.*, 2018), in that we seek perspectives beyond the motivations and sentiments of Homans.

The methods we used in this paper is to understand the actions and the practices of Homans when he built his arguments for the *Human Group* (1950) by using a similar method. We use the published works of Homans and the rest of the Mayo group to unearth examples of social exchange. In addition, we also use interviews as Homans was familiar with and believed in the interview method (Homans, 1984) and to supplement the historical record. Homans is the key figure here. First, he is the father of SET. Second, Homans visited the plant with Mayo several times and started his relationship when Mayo was writing. Third, Homans used examples from *The Human Group* to illustrate what became SET. Accordingly, we seek to understand Hawthorne to understand the meanings of spontaneous cooperation through use of SET. In this manner, we use the method of interpretivism of Rhodes and Bevir (2003) by looking at the documents involved to unpack meanings.

### Literature review

The fact that the Hawthorne studies opened new and unexpected vistas for research has produced a combination of insight, debate and confusion not only in management but also in social sciences (Muldoon, 2017; Sonnenfeld, 1985). For some scholars, the Hawthorne studies were a beacon of cooperation in the darkness of the Great Depression (Viteles, 1941). For others, the Hawthorne studies, while recognized as brilliant and a classic study in management (Muldoon, 2017), were an aggressive attempt by elites to regain lost power (Muldoon, 2012). Some scholars view the study as vindication of goal setting; some see it as

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an example of behavioral management; others see no merit in the studies, deeming them scientifically worthless (Furnham, 2012). There have been various statistical analyses of the Hawthorne studies over the years, often coming up with different interpretations. Sonnenfeld (1985), Muldoon (2012, 2017) and Wren and Bedeian (2018) have reported on the various criticisms, praises and interpretations of the studies. We agree with Wren and Bedeian (2018) that there is so much mystery, we may never quite know what happened at Hawthorne. The original Hawthorne researchers would have agreed with Wren and Bedeian, who argued that the importance of the Hawthorne experiments is found in the questions that they raised rather than the answers that they provided. Whyte, Roethlisberger, Homans and even Elton Mayo felt that the purpose of the study was to create new hypotheses. All Hawthorne had demonstrated was that workplace life was complex. Future research was needed to provide an explanation and understanding of small group phenomena. There were several attempts regarding this over the years from scholars such as Wilbert Moore, Chris Argyris, Whyte and Homans.

### *George Homans and social exchange theory*

The Hawthorne studies have long been shrouded in controversy. Of these that did try to make sense of the studies' unusual findings as to group organization and behavior is George Homans, who was a prominent sociologist from Harvard University and the creator of SET. A central participant in the studies as a defender, Homans concluded that the studies were hypotheses of light (e.g. discovery), not proof. In *Human Group* (1950), Homans provided the genesis of explanation for the Hawthorne findings, noting that interactions between various members of the groups created strong feelings of affiliation and trust. These in turn created mutual dependence between members of the group, which encouraged the members to take on additional behaviors, both work and social related, to aid the group. This was Homans's initial explanation for why productivity in the studies increased. Yet, he also regarded this study to be a first step to determining the exact nature of what leads to *spontaneous cooperation*, a term used by Mayo to describe agreements between groups and individuals, where the terms of the collaboration are not discussed beforehand but occur organically through interaction. Homans noted that he did not provide an explanation as to why *spontaneous collaboration* occurred, mainly that it did. He also indicated that *spontaneous collaboration* can work against the corporation, demonstrated by workers within the bank wiring room at Hawthorne who worked together to subvert the interests of the organization, which is another outcome that could happen within a SET relationship.

Interactions and mutual dependence between group members and spontaneous cooperation helped Homans eventually develop what would become known as SET with the aid of behaviorism and the percepts of logical positivism. Homans's SET is one the primary theories in the organizational behavior literature (Muldoon *et al.*, 2013). SET has been used as a theoretical explanation for job performance (Organ, 1988), organizational support (Rhoades and Eisenberger, 2002), intra-organization relationships (Coyle-Shapiro and Shore, 2007), trust (Blau, 1964), personality research (Kamdar and Van Dyne, 2007), organizational commitment (Klein *et al.*, 2009), job satisfaction (Lavelle *et al.*, 2007), turnover (Wayne *et al.*, 1997), justice (Cropanzano and Rupp, 2008), workplace safety (Hofmann *et al.*, 2003) and other aspects of leadership (Liden *et al.*, 1997). As Cropanzano and Mitchell (2005) have noted, SET casts a major light on the field. As a prominent theory of research, it has attracted various commentators on how it is used (Cropanzano and Mitchell, 2005; Lavelle *et al.*, 2007), its history (Coyle-Shapiro and Conway, 2004), and the intellectual and biographical background of its father George Homans (Molm, 2006; Muldoon *et al.*, 2013, 2018).

*Social exchange theory – the basics*

SET is a theory of sociology and management that uses economics and behavioral psychology to explain behavior. As stated by [Homans \(1961\)](#), the goal of SET is to explain behavior and not just to describe it. SET describes the behavioral interactions between two or more individuals and how these behavioral interactions reinforce the other's behavior. Both actors would exchange with one another on the belief that the exchange would produce benefits for both. A social exchange is merely an interaction between two or more persons where an exchange of tangible and/or intangible activities occurs between partners and the "general expectation of some future return, [although] its exact nature is definitely not stipulated in advance" ([Blau, 1964](#), p. 93). Unlike an economic exchange, the terms and repayment of a social exchange are not known upfront.

SET has been used to describe a wide variety of relationships, from supervisor/subordinate relationships to romantic relationships to relationships with family members to friends and acquaintances. For an exchange to last, it should have higher benefit than cost to both parties. As [Emerson \(1976\)](#) argued, SET is an economic analysis for social situations. One of the reasons behind SET's popularity is the ease with which it can be tested and how well it can be applied to a wide variety of social situations. SET consists of two building blocks of exchange – content and process. The content of the exchange considers the various resources that are exchanged between partners. The second building block of process deals with the "how" – the way various partners can receive benefits from each other.

*Examples of social exchange*

Let us review general examples for social exchanges. SET assumes that exchanges occur based on voluntary actions by two involved parties, both of whose actions influence and reinforce the exchange. From [Homans's \(1961, p. 2\)](#) perspective, "when a person acts in a certain way he is at least rewarded or punished by the behavior of another person." Simply put, social exchange does not hinge upon whether a husband buys his wife a dress but, instead, whether the husband expects to be praised or condemned by his wife for the purchase. It is the interaction between both husband and wife that creates the social exchange. If the wife, happy over receiving the dress, kisses him, then a social exchange has occurred. Or if she is unhappy, and yells at him, a social exchange is evident too.

Another example of a social exchange, as used by [Homans \(1958\)](#), would be a worker asking an expert for advice. Unlike the case above between husband and wife, this exchange is between unlike partners. Due to level of knowledge, the expert has power and may not be willing to exchange. Perhaps the only thing the worker could use to encourage the expert to exchange would be a statement of gratitude. Whether the expert will furnish the counsel is unknown, and whether the worker responds with an acknowledgement of gratitude is in question as well. The relationship will solidify if the expert provides advice and the worker reciprocates the services with an expression of gratitude, making it more likely for future exchanges to occur as both parties have acquired benefits. Social exchange has been used to describe helping behaviors to both coworkers and the supervisor, demonstrations of pride in the organization, as well as commitment ([Lavelle et al., 2007](#); [Organ et al., 2006](#)).

*Elton Mayo's influence on Homans and social exchange theory*

A key influencer on Homans and his development of SET was Elton Mayo ([Muldoon et al., 2013](#)). Mayo was deeply connected to the Hawthorne studies, providing what would be the first explanation of the results of the study ([Muldoon, 2017](#)). Referring to the relay assembly group, Mayo indicated in 1945 that "the six individuals became a team and the team gave itself wholeheartedly and spontaneously to co-operation in an experiment" (p. 64). Mayo did

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not argue that the Hawthorne studies had proved anything; in fact he wrote in 1945 that the Hawthorne studies, and other industrial research, had not provided any explanation on how to create *spontaneous collaboration* between various groups in society. Mayo felt that bureaucracy could not create any degree of trust because in bureaucracy the terms are discussed beforehand and can generate lack of trust. As [Wren and Bedeian \(2018\)](#) stated, trust may have been the unmeasured variable that affected some of the Hawthorne findings. Mayo's suggestions, both in 1933 and later in 1945, were that group interactions within and with management created social bonds. In doing so, he proposed that social motivations could lead to higher degrees of performance within the group. Mayo also noted that one of the problems of society was that the lack of social connection and sense of community would cause people to become unhappy, obsessive and potentially dangerous. In 1933, Mayo added that every social group must secure for its individuals the maintenance of spontaneous cooperation throughout the organization along satisfaction of material and economic needs.

Mayo proposed that the difference between what he called modern society versus primitive society was that primitive society had the means of producing *spontaneous collaboration* through a combination of gift-giving and rituals. He argued that modern society had failed to reproduce or replace rituals, which meant that society was nothing more than a "rabble," with only the state providing any sense of cooperation ([Mayo, 1945](#)). Yet, Mayo also understood, that collaboration could not occur in a free society with the state dictating policy and terms, as it would lead to an absolutist or authoritarian state. Therefore, what Mayo sought were tools that could spontaneously produce feelings of collaboration and group belonging. In his 1945 work, Mayo had noted that society had yet to develop techniques that could create collaboration; he hoped that future research and analysis could create these techniques. He left it to his students, most notably Roethlisberger and Homans, to develop how and why collaboration occurs, a challenging task. [Sorokin \(1966\)](#) acknowledged that integral systems of society are dynamic but can never embrace all the cultural elements of a society. As such, it is hard to predict group changes and development of cooperation between group members.

Despite Homans's deep connections to Mayo (as a mentor and colleague), the human relations group and the Hawthorne studies, few studies have researched the relationship between SET and Hawthorne. The few studies that have done either noted the work of Homans ([Muldoon, 2012](#)), his work on industrial sociology ([Appold, 2006](#)) or his relationship with Mayo ([Muldoon et al., 2018](#)). This has occurred despite repeated statements by [Homans \(1962, 1964, 1983, 1984, 1986\)](#) that he developed SET following his relationship with Mayo to understand how spontaneous cooperation occurs. In fact, [Homans \(1984\)](#) provides a rough outline of his research, using *The Human Group* (1950), to name the variables of the Hawthorne study and then using behavioral psychology to outline the relationships between those variables.

### **Illuminating the principles of social exchange theory with Hawthorne studies**

The Hawthorne studies (1924-1933) were a series of studies at the Western Electric facility in Cicero, IL, which explored working condition and productivity in an attempt for management to understand the sociological, psychological, and physical factors at work ([Schlagheck and Lantz, 2014](#)). The studies included several key sub-experiments: illumination (1924-1927), relay assembly group (1927-1933), mica splitting tests (1928-1930), interviewing program (1929-1930), and the bank wiring room (1931-1932). Summary of the findings are listed in [Table I](#). Next, we present evidence for social exchanges in these experiments, especially in the relay assembly room and the bank wiring tests. According to [Adams and Butler \(1999\)](#), many trace the beginning of industrial sociological to those two sets of experiments.

*Illumination tests (1924-1927)*

The Hawthorne Studies started with MIT-led illumination studies in 1924. Those studies were funded by General Electric (GE) and the National Research Council. The studies were conducted to demonstrate the supposed effect of illumination on increased productivity at work. Ironically, the illumination studies showed increase in productivity regardless of the amount of illumination used in the study. As there is no final formal report of this work (Roethlisberger and Dickson, 1939; Adams and Butler, 1999) and the studies did not focus on social interactions within the studied groups, it is understandable it is hard to identify social exchange in them. Yet, the illumination studies were important in setting the foundation for additional studies of employee effectiveness at Western Electric (Roethlisberger and Dickson, 1939). Supervisors in the illumination studies, Hibarger and Snow, were instrumental in raising questions about the illumination studies that led to follow-up studies (Wrege, 1976). The illumination studies were in a way the first step in a journey at Hawthorne toward finding universal social truths that will eventually set the foundation for SET. A 1983 interview by Greenwood and Bolton with a 93-year-old Albert Suhr, who was a supervisor at the illumination studies, indicated that as a manager, he had so much work to do that he could not have given the illumination studies much attention.

*Relay assembly tests (1927-1933)*

After the partial “failure” (or fiasco, as called by Mayo in 1945) of the illumination studies, executives at Western Electric and Harvard researchers pushed for further study of work conditions. In the consequential relay assembly studies, which became the longest running Hawthorne experiment, a group of five all-female operators (and a layout operator) performed assembly of relays while researchers studied the effect of 23 variables on performance (Schlagheck and Lantz, 2014). The small group can be considered closed network, as all members have contact with one another (Homans, 1961). Although the initial goal with the relay tests was to study the relation between conditions of work and the incidence of fatigue and monotony among employees (Roethlisberger and Dickson, 1939), the studies had become much more comprehensive and exposed sociological components that eventually found their way into Homans’s theory of social exchange.

The relay assembly studies showed social exchange both between researchers and operators and between individual operators. There was an assumption that the operators would receive benefits, both tangible and intangible goods, in exchange for their participation and cooperation in the studies. Tangible gains received by the operators included rest periods, reduced work hours, morning meals and tea, heightened medical care and increased attention from the research team (by recording, observing, and interviewing the operators). In exchange, the operators agreed to participate in the study and accept

**Table I.**  
Evidence for SET principles in Hawthorne studies

#	Hawthorne study	Evidence for SET principles
I	Illumination tests (1924-1927)	None
II	Relay assembly tests (1927-1933)	Major evidence for exchange – tangible and intangible goods for workers in exchange for their participation and cooperation in the studies
III	Mica splitting tests (1928-1930)	Minor evidence for improved attitude by workers participating in the study
IV	Interviewing program (1929-1930)	Minor evidence for sense of improvement and increased collaboration with management for interviewed workers
V	Bank wiring tests (1931-1932)	Major evidence for effects of group norms on group behavior

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changes in their working conditions. As both parties gained from the social exchange and acknowledged each other for their exchange, there was profit for both – that is, higher benefit than cost – and the exchange remained successful for six years, between 1927 and 1933 (Roethlisberger and Dickson, 1939).

The members of the small group of the relay assembly study knew they were taking part in an important and interesting experiment which would affect many (Homans, 1951). In the process, “a feeling of mutual confidence between investigators and operators” was developed (Roethlisberger and Dickson, 1939, p. 20). Such confidence helped shape the operators and the observers into a collaborative social group with an elevated morale. The test group was likely transformed by the experiments and felt important as their opinions, hopes, and fears had become of major concern to management (Robin, 1976). For instance, operator Theresa Layman, admitted that she liked being interviewed at the test room (Hawthorne studies, 1981). Moreover, operators often displayed motivation and a desire to remain in the test room and their absenteeism levels were very low (Supplementary progress report, 1929). Social exchanges between operators and researchers occurred throughout the experiments and reinforced collaboration between the groups.

It is important to note that the social exchange between operators and the research team was not built on expectations for increased production. A key factor in the assembly room was that no requirement for increased work production as a condition for the social exchange between the operators and the research team was present. Even before joining the test room, operators were told that the purpose of the test was not to boost production, but rather to study different working conditions. They were urged not to hurry, but to work in a natural pace (Roethlisberger and Dickson, 1939). Moreover, both operators interviewed by Greenwood and Bolton (1982, 1984) did not recall being required by the researchers to produce more in exchange for the benefits they received. In other words, the “cost” of performance by the operators was mainly measurement and observation without explicit guidance for increased productivity. Participation in the study was the main “cost” of the operators and required their full commitment to the studies.

As mentioned before, in exchange for their cooperation in the study, relay assembly operators received both tangible and intangible benefits. Tangible benefits included increased pay compared to workers in the department. Pay, as indicated by B.F Skinner, can act as a generalized reinforcer of behavior (Homans, 1961). Although pay was likely a motivator for the operators, many of them gave their full earnings to their families and had little personal gain from earning more (Progress report, 1928). Greenwood *et al.* (1983) explained the economic importance of increased pay as part of the effort by the operators to support their families in the harsh financial realities of the 1920s-1930s. The pay rate set by the study, according to a supervisor in the relay test group, Don Chipman, included individual pay per operator as a function of group performance and daily rate (also known as “bogey”) which was determined per individual’s experience and capabilities (Greenwood and Bolton, 1983; Hawthorne studies, 1981). The pay was derived therefore from both individual capabilities and group performance, which created motivation for the operators to work well together for both their individual gains and those of the group. This increased the motivation of the operators. As argued by Homans (1958), a social behavior which brings a personal gain is likely to be repeated.

Creating a pay dependence between members of the group was probably an important factor in creating interest of individuals in the group to work well together. According to one of the operators, Wanda “Lottie” Blazejak, the economic benefit of working in the test room was especially evident as other employees in the department realized that operators in the test group earned more than they. This likely resulted in delay of calling the test room

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operators back to work in the department after many of them were laid off during the Great Depression (Greenwood and Bolton, 1983). In other words, operators outside the test room probably developed jealousy toward the test operators who had preferential treatment and higher earnings. Economic benefits, however, cannot explain all the social aspects of behavior at the test room. As evidence, during 1928-1929, a second relay study was conducted to measure the specific effect of pay and yielded no major findings as increased pay was associated with elevated productivity initially and with the introduction of rest periods, but later leveled off when rest periods were removed (Rice, 1992). It was hard to estimate how important was pay in this case, so the second assembly room study was dropped.

The economic importance of remaining in the test room was possibly a contributing factor to the social behavior of the operators with each other to the benefit of the group. This yielded social exchanges between individual group members. The fact that pay of group members depended on performance of all group member helped establish solidarity and affected social relationships between group members. For instance, on a day when an operator was excused of work, two other operators automatically assigned themselves the task of keeping up the group earnings while she was away (Roethlisberger and Dickson, 1939). The group supervisor, Don Chipman, explained how operators helped each other when production of one of them declined: "If one girl wasn't quite up to it, for any reason, the other girls might chip in and try to help-out, though, to keep the production up, to carry that girl to a certain extent" (Hawthorne studies, 1981). Roethlisberger and Dickson (1939, p. 190) added, "while the girls were at work, it was not uncommon to find one girl increasing her output so that her friend, who might not be feeling well, could rest." "Carrying" of group members who were behind on their work by others was common in the relay assembly test room, yet a novelty phenomenon in sociology when described by Homans (1951).

Beyond the monetary benefit of working in the test room, the operators received multiple non-monetary welfares, which brought them approval and prestige and increased their satisfaction with the work and the social environment. Such benefits helped meet the emotional proposition of social exchange (Homans, 1961). Operators' improved mental state and morale at the test room in comparison to the regular department brought changes in their behavior. Once the novelty of being watched by observers leveled off, the operators were conditioned to their new working conditions and adapted accordingly as additional changes were introduced to the testing room. This conditioning to new work settings probably enhanced feelings of happiness and satisfaction in the operators and may have contributed to their increased production. As recalled by Operator #4, Wanda "Lottie" Blazejak, the operators were happy in the test room, so in her view there is no wonder productivity went up (Greenwood and Bolton, 1983).

Working in the test room came with other benefits, including care for the welfare of the operators. According to a progress report of Hawthorne from 1928, questionnaires about the operators' living physical environments and their mental states were administered and showed improvements as the studies advanced. In addition, the operators were often asked about their feelings and their ideas to improve conditions in the test room (Progress report, 1928). Attention to details included accommodating the conditions in the test room to meet the needs of the operators. For instance, when an operator in the test room complained that male observers could see the women's knees, the research team installed a modesty shield to cover the view of the operators' legs (Hawthorne studies, 1981). The operators appreciated the gesture by the research group to resolve the issue. This is an example for social exchange with reciprocity and beneficial outcomes for both parties.



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Besides attention and care from the researchers, working in the test room was also associated with physical benefits. As part of the study, the operators received medical exams in the local hospital every five to six weeks free of charge to them and those exams were often accompanied with servings of ice cream, cake, and/or refreshments to reduce operators' anxiety (Progress report, 1928). Occasionally, operators wore microphones near their chests at work to monitor their heart rate while assembling relays (Greenwood and Bolton, 1983; Progress report, 1928). Conversations that the operators had with each other were noted and analyzed by room observers to identify the mental state of the operators and aid when issues were identified. These medical exams were especially critical for one of the operators (Irene Rybacki), who was diagnosed with a blood problem (anemia) and received medical treatment following the exams. Although that operator eventually left the test room, working in the test room after receiving treatment improved her mental state and her performance and she was grateful for it (Greenwood and Bolton, 1984).

Besides overall satisfaction with the test room, freedom from rigid and excessive supervision was another important factor in the studies (Greenwood *et al.*, 1983; Roethlisberger and Dickson, 1939). By being part of the study, operators could gain mental relief away from their feared department head, Mr Platenka (Greenwood and Bolton, 1983, 1984). Operator Theresa Layman indicated – “I think we were more relaxed. We didn't see the boss, didn't hear him” (Greenwood *et al.*, 1983, p. 222). Away from Mr Platenka, the operators felt they had no real boss in the testing room and considered supervisors in the test room such as Homer Hibarger and Don Chipman as non-managerial personnel. The operators were also mostly allowed to chat freely (and loudly) among themselves – “We'd talk like a happy family” (operator Wanda, according to Greenwood *et al.*, 1983, p. 225). Initially, researchers made attempts to discourage conversation between operators, but such efforts were eventually abandoned, and conversing became an integral part of work for the operators and a source of satisfaction (Homans, 1951).

Getting attention from observers and visitors to the test room and having access to the Hawthorne tower (Adams and Butler, 1999) likely made operators feel special. During her interview, Operator # 4 Wanda indicated that being around educated people was nice as the operators themselves were mostly non-educated and did not complete high-school (Greenwood and Bolton, 1983). One of the test room operators, Theresa Layman, stated in 1976: “I had no idea there would be so much happening and so many people watching us” (“The human relations movement”). It is possible that visits to the test room by people of high rank including Clair E. Turner from MIT, Elton Mayo and Fritz Roethlisberger from Harvard University and Lilian Gilbreth (Hawthorne studies, 1981) and executives from Hawthorne Works helped enhance the operators' sense of prestige and helped establish *esprit de corps* within the group.

What made the reciprocal exchange between the operators and researchers social rather than economic was the fact that the group had no control over when reciprocity would occur or at what form. Changes were introduced as the studies advanced. From early stages, the room observer of the study updated the operators on ongoing changes in work conditions in exchange for their honesty (Roethlisberger and Dickson, 1939). According to operator Wanda “Lottie” Blazejak, the researchers rarely asked the operators for permission to make changes in the test room and when they did, the operators agreed to almost anything the researchers asked for (Greenwood and Bolton, 1984). Yet, when the operators felt a change made in the test room was not necessary, they would let the researchers know. An example for this occurred when 15-minute breaks were added in the afternoon, which some of the operators found to be too long. Wanda recalled the test group wanted to go back to

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work and meet their daily quotas, so there was no need for such long breaks and the researchers shortened them (Greenwood and Bolton, 1983).

According to Homans (1958), cohesiveness, which is defined as “anything that attracts people to work in a group” (p. 599), influences group dynamics. Such cohesiveness was targeted at a very early stage of the relay assembly study. For instance, to select the operators for the study, the researchers invited two average (neither inexperienced nor expert) operators from the department who were friendly with each other. Those two were asked to recruit the remaining group members (Roethlisberger and Dickson, 1939). By doing so, the researchers made sure the group would include people who get along with each other. The cohesiveness resulted in the development of family-oriented atmosphere. Operator Wanda “Lottie” Blazejak indicated – “it was just family, you know, real [sic] friendly” (Greenwood and Bolton, 1983, p. 224). Another operator stated: “We were a congenial bunch”. (Sommerfeld, 1985, p. 124). Operators developed group solidarity which was manifested in helping each other at work, spending more time together outside work – visiting each other’s homes, going to the movies together, and dancing – and conversing with each other often. To complement this work environment, the test room observers were instructed to keep the atmosphere friendly while observing and keeping records of activities in the room (Roethlisberger and Dickson, 1939).

Homans (1958) indicated that the more cohesive the group, the greater the change in behavior a member can experience. He also noted that the more two people interacted with each other, the more likely they are to like each other (Homans, 1950). Such effects of the group on an individual was observed in the relay station with operator Jeannie Sirchio. Jeannie was described by Wanda “Lottie” Blazejak as “hyper” and a take-over type person who liked to fight. Wanda admitted that when Jeannie joined the test room she was afraid of her (Hawthorne studies, 1981). Operator Theresa Layman described Jeannie as bossy while Don Chipman remembered Jeannie as a dominant, aggressive and take-over individual (Greenwood and Bolton, 1983; Hawthorne studies, 1981). Yet, after joining the test room and becoming friends with the group members, operators indicated that Jeannie adapted to the situation and became friendlier. Homans (1961) indicated that when group members attempt to change the behavior of an individual in the group, they are likely to direct most interaction toward that member. This occurred in this case and Theresa remembered Jeannie getting *rid of some of that fire in her. She toned down*. Wanda eventually became best friends with Jeannie and even went dancing with her. In Wanda’s view, *sometimes you learn to work with others after you spend time with them* (Greenwood and Bolton, 1983). By conforming to the group norms and practicing social control, Jeannie gained acceptance and social approval from the group and the group in exchange gained stability and reduced level of conflict. Such stability was termed by Homans (1961) as *practical equilibrium*. Roethlisberger and Dickson (1939) repeatedly mentioned how Jeannie acted as the de-facto group leader. Homans (1951) added that Jeannie was self-appointed and saw leadership as a chance for personal distinction and advancement. Initial resistance to Jeannie by other operators may be part of the group’s evolution on the path of accepting Jeannie as their leader.

Even with high level of cohesion within the group of operators, the challenging case with Jeannie was not isolated and group interactions were not without controversy. According to Roethlisberger and Dickson (1939), arguments between operators about job attitude and excessive talking which interrupted work may have led to the removal of two operators and their replacement by two new operators, Jeannie and Mary. At one point, things became so dysfunctional between group members that the layout operator and Operator Theresa Layman asked that either they or the other two removed from the test room. Yet, after the

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replacement of two operators, the group regained cohesiveness and practical equilibrium as “they had become bound together by common sentiments and feelings of loyalty” (Roethlisberger and Dickson, 1939, p. 86).

Another social phenomenon observed in the relay assembly studies which demonstrates the dynamics of influence concerned dyads of operators working in unison and pacing each other (Supplementary progress report, 1929). Operators 1 and 2, as well as Operators 3 and 4, worked in sync and had similarity in output (Roethlisberger and Dickson, 1939). The researchers estimated this may be related to *close association, conversation, and the opportunity to observe the output of the adjacent operator more easily* (Supplementary progress report, 1929, p. 92).

In studying small groups, Homans (1958) encouraged studying “real-life” work conditions and called to make *connections between experimental and real-life studies* (p. 606). In the relay assembly room test studies, the female operators performed the same work of assembling relays as was performed in other places at the facility. One of the operators (Wanda “Lottie” Blazejak) indicated when interviewed by Greenwood and Bolton in 1982 that the group did the same kind of work when they were moved from the department to the test room. Wanda recalled she was told “you’re going to do the same thing you’re doing now, so it was all right with me” (Hawthorne studies, 1981). Moreover, the testing room had similar chairs, work layouts and approximately the same lighting as in the relay assembly department (“Hawthorne progress report”, 1928; Roethlisberger and Dickson, 1939). This demonstrates the attempt of the researchers to perform the study in real-life work environment and attempt to eliminate the variable of work environment from the list of studied variables. There were, however, minor differences between the test room and the regular department. Differences in the test room included more natural light, fans for ventilation for hot summer days, and a chute used to measure the number of completed relays as they were assembled. In addition, all operators but one assembled less types of relays in the test room than in the department and the layout operator in the test room served five operators instead of 6-7 in the department. Yet, according to Roethlisberger and Dickson (1939), those differences unlikely played a significant role in the study’s findings.

Homans (1958) recommended in his SET theory for social studies to yield propositions that can relate to a larger social group beyond the group studied. Indication for that was provided by Don Chipman, a supervisor in the relay assembly room (1928-1932). Chipman indicated in his interview with Greenwood and Bolton (1982) that learnings from the experiment, such as of providing employees with 15-min break in the morning and 10-min break in the afternoon, were implemented throughout the plant even before the studies were concluded. Specifically, rest periods were tried first in the regular shop departments from which the test room operators came from and later in other departments (Roethlisberger and Dickson, 1939). This demonstrates some lessons from the Hawthorne studies were practiced across the Western Electric’s plant.

Another interesting aspect of group structure in the relay assembly study was the relative stability of the group in face of changes in personnel during the study. Cohesion was maintained in the group even though some of the ladies were less social, of different age, religion and/or marital status. For example, operator Wanda remembers Operator #1 Mary Volango as a very quiet and shy person who *kept things to herself*, but the two still became good friends after working together (Greenwood and Bolton, 1984). One of the operators, Theresa Layman, who was significantly younger than the other group members and started working at Hawthorne when she was 14 years old, was looked after by other group members (Greenwood *et al.*, 1983). Another operator, Anna Haug (Operator #5), was older than the other group members and the only group member not born in America and not Catholic. Chipman remembered Anna as a loner who *kept her nose to her business*

(Greenwood and Bolton, 1983). Those differences between members had limited effect on the ability of operators to create their cohesive social group in the test room. At the same time, it was evident that the young single ladies had stronger social ties with each other than with Operator #5, who was older and married (Roethlisberger and Dickson, 1939).

The relay assembly group showed socialization of new members to the group norms of collaboration. Norms are statements made by member/s of a group for how group members should behave under certain circumstances (Homans, 1961). For instance, Anna Haug, Operator #5, came in and out of the test group and eventually left during the Great Depression to her homeland of Norway. After Anna left the study room, she was replaced by Antoinette Carilo, who was integrated smoothly into the group of the young single ladies (Greenwood and Bolton, 1984). Another operator, Adelaide Bogtowicz (Operator #1), got married and was replaced by Mary Volango, as it was common at that time for married women not to work (Hawthorne studies, 1981). Even with those changes in the composition of the group, the operators were successful in maintaining their cohesiveness as a group.

The relay assembly room study (1927-1933) provides a fascinating channel to view social exchange at play. The exchanges in the relay assembly room were summarized well by Wanda, who stated – “They (study) were happy with us and we (operators) were happy with them” (Greenwood and Bolton, 1983). This is a good description of social exchange in its core form.

#### *Mica splitting tests (1928-1930)*

The mica splitting tests conducted at Hawthorne shared plenty of similarities in study setup with the relay assembly tests, but the social exchange facets so strongly evident in the relay assembly room were quite lacking in the mica splitting room (Roethlisberger and Dickson, 1939). First, unlike with the relay assembly room, there was no reduction in absenteeism or increase in performance seen in the mica splitting study, which may suggest a difference in attitude toward attendance (Roethlisberger and Dickson, 1939). Second, the mica operators did not display increased social activity outside working hours and had no social “parties” such as those of the operators at the relay assembly room. Third, the mica operators rarely conversed during the day of personal or non-work-related topics. Fourth, operators showed no evidence of willingness to help one another or presence of a true leader to keep operators accountable for each other’s work. Finally, the mica splitters showed no evidence of pacing each other as was seen with the relay assembly room (Roethlisberger and Dickson, 1939). Thus, one can conclude that the individuals at the mica splitting experiment remained “individuals” and failed to develop social aspects of a group, solidarity, reciprocity or cohesion. This makes the relay assembly tests even more impressive for the social exchanges they were able to demonstrate.

To understand why the mica splitting test resulted in such different results than the relay assembly test, one must investigate the differences between the two studies. While it is hard to pinpoint the exact reasons for the “failure” of the individuals in the mica splitting room to develop group cohesion, Roethlisberger and Dickson (1939) highlighted the wide divergence of interests and outlook of operators in the mica splitting test, which was quite different than the homogenous group of ladies in the relay assembly group. In addition, the fact that the pay in the mica room was based on individual piece rate and not affected by group performance would be a relevant factor. The mica splitting studies did provide occasional examples for social effects on behavior, but this was mostly minor. For instance, there was a case of an operator who had attendance irregularities before the study but improved her attendance and attitude significantly after being part of the study, possibly because of improved attitude related to the close human interactions she exhibited in the test room

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(Roethlisberger and Dickson, 1939). Such evidence for social exchange in the mica splitting room, however, was much less common than in the relay assembly room or the bank wiring tests.

#### *Interviewing program (1929-1930)*

Minor cases of social exchange were also evident in the interviewing program, a program across Western Electric which was set for supervisors to understand and handle personal and social situations under their responsibility (Roethlisberger and Dickson, 1939). The goal of the interviewing program was to use direct questions about employees' feelings to collect data about supervision. These interviews were then used to make corrections and create training for supervisors. In that regard, exchange between parties was mainly in terms of providing employees with an open ear for their concerns in exchange for their openness and honesty. During its operation, the program interviewed over 20,000 employees (Gillespie, 1985). Mid-way through the process, during 1930, with guidance from Mayo, interviewing methodology moved from close-ended questions to open questions, also known as non-direct interviewing. A non-directive approach was established to allow interviewees to further voice their opinions about working at the company (Roethlisberger and Dickson, 1939). With the nondirective approach, the length of the interviews and the information gathered increased.

Complaints made by interviewed employees became symptoms to be explored to separate fact from sentiment (Roethlisberger and Dickson, 1939). Such complaining during the interviews seemed to have a cathartic effect on some of the interviewed workers. In other words, the fact that interviewees were listened to was associated with a sense of improvement even in cases where no actual actions were taken to change unfavorable working conditions. The interviewing program brought some corrections to work conditions, contributed in presenting material to train supervisors, brought psychological benefits to the interviewees and provided material for research (Roethlisberger and Dickson, 1939). As the interviews focused on individuals and anonymity was a key condition to gain the honesty and transparency of interviewed employees, they did not yield major direct outcomes with regard to understanding social exchange behaviors. It is likely that the level of trust developed between interviewers and interviewed employees did not reach high levels often observed during mentoring relationships or counseling sessions. Yet, employees discussed strong informal relationships with colleagues. In his autobiography, *The Elusive Phenomena*, Roethlisberger (1977) write about the strong informal relationships workers formed with each other and their importance to maintain common purpose and work value. Yet, the program demonstrated how interviewing can help individuals associate better with fellow workers and/or supervisors and increase their collaboration with management (Mayo, 1945). In addition, the interviewing program kept the company engaged in the studies and led to the second critical study to SET, the bank wiring tests.

#### *Bank wiring tests (1931-1932)*

The bank wiring tests offer multiple examples for social exchange at play and further evidence for the effects of group norms on group behavior. These tests attempted to develop a method to study social groups within the company in way of actual observations of work behavior and study of group dynamics and motivation (Roethlisberger and Dickson, 1939; Schlagheck and Lantz, 2014). The study group included 14 all-male workers: 9 wiremen, 3 soldermen and 2 inspectors. Differently than the relay assembly group, the study participants in the bank wiring study were given no special benefits or favors and their supervision remained as in the department. With regard to compensation, individual

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earnings were per a non-effective group incentive plan (Mayo, 1945). In other words, “individuals were affected by the output of every other person in the group” (Roethlisberger and Dickson, 1939, p. 410). At the same time, wiremen received more pay than soldermen as they were presumed to be more skilled and had more seniority; within wiremen, connectors of equipment got paid more than selectors (Homans, 1961). All workers were studied by an observer and an interviewer with complementary roles. While the observer was to be friendly with the work group, the interviewer was to remain an outsider (Roethlisberger and Dickson, 1939). After an initial period of distrust demonstrated by workers toward the observer, things settled, and the behavior of the workers reverted to its natural state including loud talking and joke making (Roethlisberger and Dickson, 1939). The group structure was useful in protecting the group from both internal indiscretions and external interfaces.

Interviews conducted with bank wiring group members showed that group production in the bank wiring study was restricted by the group against management’s goals (Robin, 1976). In other words, workers reacted to management goals with distrust and did not consider the social exchange offered by management valuable. The “costs” associated with increasing production were perceived by workers as higher than the reward, which resulted in their view in an overall “loss”. As explained by Homans (1961), for justice to be present in social exchange, rewards should be proportional to investments. As management failed to offer employees value for increased production, the group reacted to demands by restricting output to protect their own interests. One worker indicated in his interview that the group doubted increased production to result in increased pay – *we would just be turning out more work for the same money* (Roethlisberger and Dickson, 1939, p. 418). Moreover, some workers feared increased output would result in layoffs.

In the bank wiring tests, workers responded to group production norms more than to external factors. To protect their jobs, they sanctioned and disfavored employees who violated their “norms”. Both high-achievers (“rate-busters”), low-achievers (“rate chiselers”), and supervisor-collaborators (“squealers”) were discouraged as they were considered as threat to the group (Roethlisberger and Dickson, 1939; Roethlisberger, 1941). Social exchanges between the group and members who violated group norms were intended to discourage such behaviors. Rate-busters were often called by derogatory names such as shrimps, speed kings, runts or slaves; they were discouraged because they demonstrated to managers how fast the work can be done (Roethlisberger and Dickson, 1939). Rate-busters were laughed at and physically harmed using a hitting game that workers called “binging.” Rate chiselers were discouraged as well for different reasons. In their case, it was because they hurt the group’s joint efforts and were not contributing as much as the others. Squealers were considered dangerous to the group as they shared information with supervisors to the detriment of a group member. A group of workers in this case, rather than management, decided what was considered a fair amount of work, which supports the view later described by Chester Barnard (1938), who argued that the effectiveness of an organization depends on the ability of the organization to satisfy the needs of individuals. What emerged in the bank wiring room was a form of “informal organization” that supported soldiering-like behavior and restriction of output (Wren and Bedeian, 2018).

Examples for social exchange were observed between workers in the bank wiring group. Occasionally, when a worker was behind on his work, another jumped in to help and/or trade jobs with him. This occurred more often when the struggling employee showed great effort rather than simply working slowly (Roethlisberger and Dickson, 1939). As expected in a social exchange, help provided by one worker to another often resulted in demonstrated appreciation by the helped worker.

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### Social identity theory versus social exchange theory

There have been other theories and explanations to the increase of production of the Hawthorne studies. Various scholars have offered differing explanations over the years for the findings at Hawthorne—despite the admonishments of both Mayo and Homans who argued the limits of the experiments. Scholars have offered goal setting, learning, behavioral management, and changing of the various workers. While each of these ideas has merit, we would like to focus in particular on the work of [Wren and Bedeian \(2018\)](#) who argued that production increased as time passed, suggesting that trust developed between the various participants—trust is an important element of social exchange.

In particular, we would like emphasize Hassard, who implied that social identity theory could be the key theory to explain production. [Hassard \(2012\)](#) argued that several factors, including the Great Depression, the sinking of the SS Eastland (1915), fighting for better conditions and Americanization led to the workers to develop a sense of identity. Two additional explanations could be offered as well from [Cohen \(1990\)](#). First, the rise of popular culture and the decline of immigration combined to provide workers with a sense of identity, whereas previously they would have been divided along ethnic lines. Second, the collapse of welfare capitalism encouraged workers to find a new and better working environment. All these factors enabled the creation of a new working class. Hassard is correct; social identity, a sense of belonging to a group or class, did play an important element in production.

It is important to note that there is considerable overlap between social identity theory and SET as noted by several scholars. For example, [van Knippenberg et al. \(2007\)](#) posit that social exchange explains why people do not leave groups and social identity is why people stay in groups, complementary perspectives on organizational performance and withdrawal. Yet, other scholars have seen social exchange as a reason why people stay in relationships: the anticipated future benefits from the relationship ([Blau, 1964](#)). Other scholars such as [Lawler \(2007\)](#) view social identity as a prerequisite to social exchange. The sense of belonging or identity promotes toward emotions which induce trust, which then leads to cooperation. In other words, both theories explain similar phenomena and can work with each other. Our work complements and extends that of [Hassard \(2012\)](#).

Finally, it is important to note that social exchange was developed in part due to the findings of the Hawthorne studies, namely through the work of Homans. The story of how it came about is a complicated one—but Homans did find inspiration in the Hawthorne studies. Future scholars, men such as Simon, March, Williamson, Katz and Kahn and Organ, have all stressed the need for managers to gain and promote cooperation through the organization. In doing so, they have recommended reciprocity and other social exchange outcomes. Organ has focused on spontaneous helping behaviors (similar to Mayo's spontaneous cooperation) using social exchange and Hawthorne studies as inspiration. Accordingly, we argue based on both Mayo's, Homans's and later work by Organ, that social exchange is a very powerful suggestion.

### Conclusion and theoretical contribution

This paper seeks to address several points in the literature. First, we used a combination of published work by Homans, Roethlisberger and Dickson and Mayo and others, as well as oral histories conducted by Bolton and Greenwood, to argue that the Hawthorne studies of the relay Assembly and Bank Wiring tests illustrate (or illuminate, as listed in the paper's title) the principles of SET. The idea is that Homans developed SET to explain findings from studies such as Hawthorne about group behaviors. We provide further support, including Homans' own admission, which was mostly ignored by other researchers, that it is through the attempts to explain the Hawthorne studies, and the post-Second World War controversies

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over those studies, that Homans developed SET. Second, the paper provides further evidence for the construction of a fundamental theory by linking theoretical concepts to observable behaviors. Homans' SET brought together concepts from multiple disciplines and offered a framework to explain social behaviors. Key concepts in social exchange including reciprocity, group cohesion, reward, cost, and profit have their roots in the Hawthorne studies (specifically, the relay assembly and bank wiring tests) and helped Homans explain ways in which firms can go beyond monetary exchanges. Third, the Hawthorne studies demonstrated how social situations play an important role in task performance and productivity and how social exchanges can facilitate it. For example, approval of fellow group members in the bank wiring room study was shown to be important in the non-compliance of the group to management production goals (Robin, 1976). In a similar way, group cohesion, solidarity, and reciprocity in the relay test group led to full compliance with management, increased morale and increased production. As discussed by Roethlisberger and Dickson (1939), while both the relay test room group and the bank wiring group had both formal and informal organizations, in the first there was a compatibility between the informal and formal organizations while in the latter not. This resulted in lower level of collaboration in the bank wiring room. Fourth, SET was what Mayo described as *spontaneous collaboration*. In Mayo's view, collaborations have declined steadily in society since the sixteenth century, which contributed to absenteeism, restriction in output, unionism and strikes (Wood and Wood, 2004). The solution that Mayo proposed therefore was to train managers in human relations and re-establish *spontaneous collaboration*. By seeking tools to produce feelings of collaboration and group belonging, Mayo believed social bonds can be created (Mayo, 1933, 1945). With SET, Homans not only provided explanations for the creation of strong feelings of affiliation and trust through interactions and mutual dependence between group members but also provided evidence to Mayo's concept of *spontaneous collaboration*.

There are several points that could be built upon on our analysis. First, the two Hawthorne studies that have received the most attention are the relay assembly test and the bank wiring test. They were also the most well-defined examples of social exchange. Perhaps, both the Hawthorne researchers and subsequent scholars focused on both studies because of this factor. Second, perhaps the reason why Hawthorne came to dominate the literature versus other studies may have been due to its connection to the theorizing of both Homans and Parsons. This is not to say that Hawthorne was better – but its influence may have been due to the influence of others. Finally, SET was based on induction (Homans pointing out examples of exchange) and then later deduction (based on theorizing) using the vocabulary gained from his earlier work. Future research should address these issues.

There are several limitations to our study. First, the Hawthorne studies can lend themselves to multiple perspectives due to design flaws. Therefore, our argument is only one interpretation – even if it is something that the researchers would have supported. Homans was aware of this issue as well, which is why he defended the studies, the methods and sought to explain the findings further analyzing other studies and then adding behavioral psychology to explain social interactions. Our work is similar to the Humphreys *et al.* (2016) paper on Owen's narcissistic leadership in that other explanations can be offered. Furthermore, we use Rhodes and Bevir's (2003) ideas of interpretivism in that we need to unpack the meanings, beliefs and preferences of the scholars involved to understand the purpose of their analysis.

Writing about history (or re-writing it) includes risks and challenges to separate past from present (Cooke, 2009). By describing observable behaviors from the Hawthorne studies using combination of published work and archival data of oral histories of Hawthorne



workers, this paper overcomes some of the challenges often associated with historical work including the challenges of memory/recollection and the bias of interpretive positioning and analytical frames deployed. This aids in understanding the construction of a fundamental management theory and linking SET's theoretical concepts with observable behaviors at Hawthorne. New readers can gain understanding for how Hawthorne studies influenced management thought. The conclusion is that SET by Homans can be illustrated using the Hawthorne studies, which helped establish it.

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